Title
Necessary and Sufficient Process Leading to Work Smart Standards. Final Report

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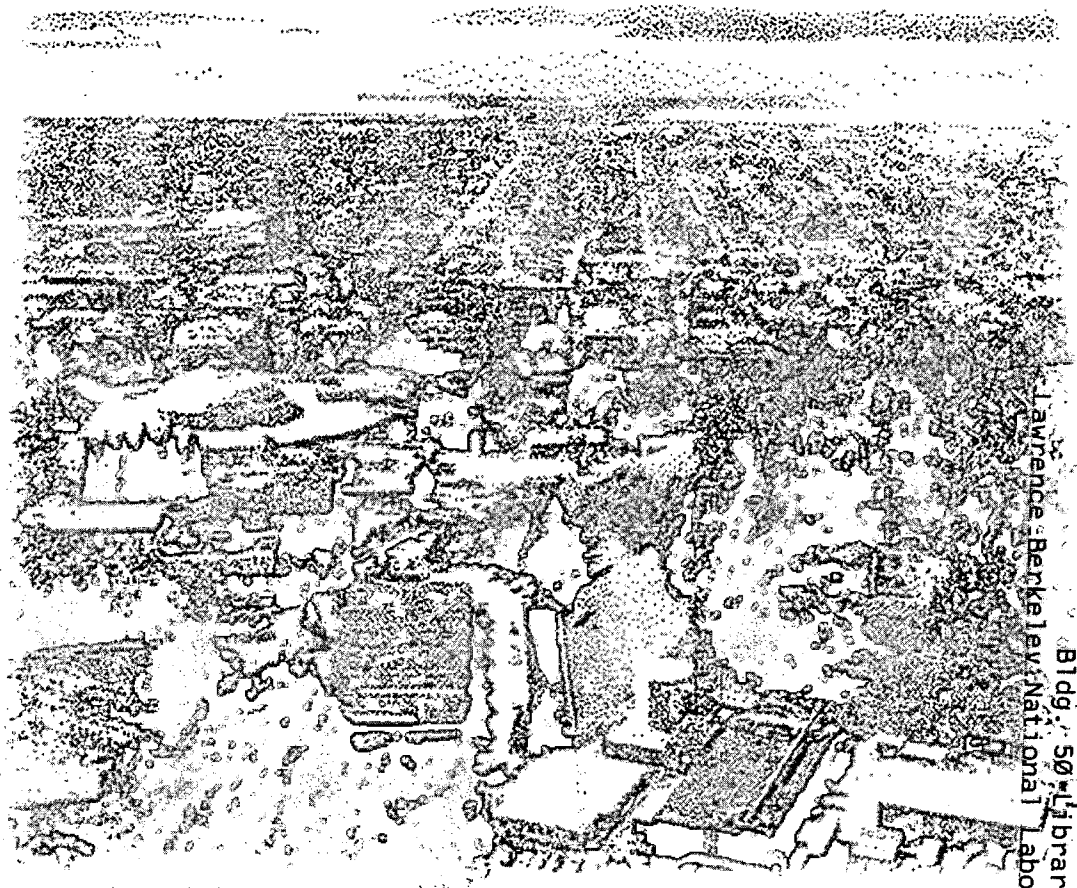
ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY

Necessary & Sufficient Process Leading to Work Smart Standards Supplement

Final Report

November 1996



DISCLAIMER

PUB-3134

Necessary & Sufficient Process Leading to Work Smart Standards Supplement

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Supplement

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DOE M 450.3-1

1-25-96

THE DEPARTMENT OF ENERGY CLOSURE PROCESS FOR NECESSARY AND SUFFICIENT SETS OF STANDARDS

U.S. DEPARTMENT OF ENERGY

Department Standards Committee

Distribution:
All Departmental Elements

Initiated By:
Department Standards

SUBJECT: THE DEPARTMENT OF ENERGY CLOSURE PROCESS FOR NECESSARY AND SUFFICIENT SETS OF STANDARDS

1. PURPOSE. In 1994, the Department Standards Committee (DSC) established an integrated standards-based management system, which is reflected in the "Criteria for the Department's Standards Program" (DOE/EH/0416). The Criteria's primary objective is to promote a culture based on Environment, Safety, and Health (ES&H) standards tailored to work and to move away from a "one size fits all" approach. The Criteria establishes the expectations of how DOE personnel, contractors, and other interested parties should interact in defining standards necessary for performing work, integrating those standards into the process for planning and accomplishing work, evaluating the efficacy of the standards in light of current missions, and continuously assessing the effectiveness of the standards in providing adequate protection to the worker, the public, and the environment.

One of the DSC's first tasks was to encourage a common understanding that the Department's work should be planned, performed, and appropriately documented in accordance with a set of agreed-upon standards to ensure adequate protection of the safety and health of workers, the public, and the environment. The DSC recognized that a key to the success of the Department Standards Program is the availability of a process that provides a disciplined and collaborative analysis of the work to be performed and the potential hazards associated with that work.

The DSC charged a Standards Process Action Team (SPAT 3/4) to develop a Department-wide process for identifying the standards necessary and sufficient to ensure adequate protection against the hazards associated with the work of the Department. The draft Closure Process produced by the Standards Process Action Team was successfully demonstrated by several pilots at a variety of activities, facilities, and sites throughout the DOE complex.

2. SUMMARY. This Manual describes the six elements established for the "Closure Process for Necessary and Sufficient Sets of Standards," herein referred to as the Process, and summarizes "lessons learned" from the pilots. The Process can be applied at any organizational level and by any organization within the DOE complex, and can be used to establish contractual commitments between the Department and its contractors.

The pilots demonstrated that several intangible benefits accrue when the Process is conducted properly to tailor sets of standards to specific work and hazards. One benefit is the enhanced communication among DOE, contractors, and Stakeholders, fostering a better understanding of the work and the hazards and acceptance of a set of standards. Feelings of synergy, team spirit and empowerment were created among the various team members and teams. In the longer term, more tangible benefits will include measurable improvements in the performance of Department work.

Experience shows that approval of the necessary and sufficient set of standards is readily obtained if the Process Elements are followed and the principles are fulfilled.

d. The justification of the necessary and sufficient set includes identification of any implementation assumptions and interfaces. Implementation assumptions are a mechanism by which uncertainties in the work process are addressed. These assumptions may deal with management issues such as the availability of resources, hardware issues such as the availability of control systems, or process issues such as the compatibility of materials used in accomplishing the work. Interfaces relate to the relationship between the requirements associated with the work to be performed and others beyond the scope of that work. These requirements may be organizational as in the case of work specific training requirements as a subset of a larger set of requirements, hardware requirements as in the case of a Heating Ventilation and Air Conditioning (HVAC) system serving the work area as a segment of a larger HVAC system, or programmatic requirements as in the case of quality assurance requirements for the work in the context of a larger quality assurance program. These interface requirements must be identified and satisfied before work can proceed.

e. Depending on the complexity or controversy surrounding a particular situation, the Convened Group responsible for planning and conducting a particular necessary and sufficient process may decide that confirmation by an independent team is needed to support approval of the set. This is a matter of judgment to be exercised by the Convened Group.

To provide as much flexibility as possible, the Process permits the Convened Group to designate the level and identity of the Approval Authority during the initiation of the Process. The Approval Authority will approve the set as adequate on the basis of a determination that the Process has been correctly implemented.

f. The value of affording all appropriate Stakeholders an opportunity to contribute to the Process cannot be overemphasized. The value of inviting Stakeholders to provide their views, even when they decline, has been proven by experience. Because acceptance of the set is one of the underlying goals of the Process, the appropriate Stakeholders should always be informed of the intent to conduct the Process and be invited to contribute input. Consistent with guidance related to the Federal Advisory Committee Act, Stakeholders (i.e., individuals who are not Federal employees or Department contractor or subcontractor employees) provide their individual views on issues raised by the Process, but may not be members of the consensus seeking groups. The Convened Group must ensure that Stakeholders are provided with appropriate opportunities for input, and that their views are shared in a manner consistent with the Federal Advisory Committee Act.

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CHAPTER I

INITIATING THE NECESSARY AND SUFFICIENT PROCESS

1. OBJECTIVE. To determine whether to initiate the Process and to assign responsibility for conducting the Process.

2. DISCUSSION.

   a. Agreement Parties may initiate the Process if one or more of the following criteria is satisfied.

      (1) A set of standards does not exist, as in the case of a new activity.

      (2) An existing set of standards (e.g., the current set of all applicable Department directives) is no longer appropriate due to changes in mission, regulatory environment, degree of hazards, performance expectation, or knowledge.

      (3) The applicable contract requires that the Process be used.

      (4) A Stakeholder demonstrates to the satisfaction of the Agreement Parties that the existing set of standards is either not necessary or not sufficient to provide adequate protection. Evidence provided should be based on the set of standards, not on the way the standards are implemented.

   b. When the Agreement Parties determine that at least one of the criteria is satisfied, they:

      (1) jointly designate, preferably within the Responsible Organization, a Process Leader who will be responsible for conducting the Process,

      (2) designate individuals within their respective organizations to serve as members of the Convened Group,

      (3) identify Resource Authorities and any other Federal officials to be approached for participation as members of the Convened Group, and

      (4) identify interested Stakeholders to be approached to provide input to the Convened Group.

      The value of inviting Stakeholder contribution, even when it merely provides them with an opportunity to decline, has been proven by experience. Because acceptance of the set is one of the underlying goals of the Process, the appropriate Stakeholders should always be informed of the intent to conduct the Process and be invited to contribute.

CHAPTER II

PRODUCING A NECESSARY AND SUFFICIENT SET OF STANDARDS

1. OBJECTIVE. To produce and reach closure on a necessary and sufficient set of standards to meet performance expectations and objectives for providing adequate protection to workers, the public, and the environment.

   a. This phase consists of the following six major Process Elements.

      (1) Defining the work and hazards.

      (2) Creating the team(s).

      (3) Defining and agreeing to protocols and documentation requirements for the team(s).

      (4) Identifying the necessary and sufficient set of standards.

      (5) Confirming the necessary and sufficient set of standards.

      (6) Approving the necessary and sufficient set of standards and authorizing work to the set.

      As understanding is gained through use of the Process, it will often be necessary to repeat the various elements to incorporate changes to the scope, expectation, team(s), or set of standards.

   b. The level of detail and effort required for each of the elements will vary depending on the particular application and experience in applying the Process. For example, the element on "defining work and hazards" will require less effort for established and ongoing activities than for a new startup.

2. PROCESS ELEMENT 1: DEFINING THE WORK AND HAZARDS.

   a. Objective. To define the work and performance expectations to which the standards apply.

   b. Discussion. A clear definition of the work performance expectations, work environment, and associated hazards and uncertainties is critical to the successful identification of a necessary and sufficient set of standards. Tailoring a necessary and sufficient set of standards to the work and hazards ensures that the desired level of protection is achieved efficiently.

      The definition of the work and hazards provides an opportunity to determine if any of the identified hazards can be reduced or eliminated (e.g., by the use of alternative materials or methods).

a Performance expectations and objectives (for example, goals for safety, quality, and operations).

b What actions will be performed.

c Physical conditions within which the work will be performed.

d Materials and conditions that could cause adverse consequences

e Uncertainties about the work.

f Organization and management

2 Resource Authorities provide information on Resource availability and constraints.

(c) Endorses the initial definition of the work, hazards, and performance expectations compiled by the Process Leader. The initial definition is subject to refinement during the application of the Process.

3. PROCESS ELEMENT 2: CREATING THE TEAM(S).

a. Objective. To create one or more teams to identify a necessary and sufficient set of standards and confirm that the set is adequate and feasible.

b. Discussion.

(1) The identification of a necessary and sufficient set of standards for a defined scope of work relies on the collective judgment of a team of knowledgeable people. The team must establish that implementation of the set is feasible and that the set provides a basis for adequate protection.

(2) Confirmation of the adequacy and feasibility of the necessary and sufficient set of standards strengthens the credibility of the Process and confidence in the set of standards. The level of formality and independence of the confirmation process will depend on the specific circumstances. For complex or controversial issues, it will be necessary to use relatively rigorous methods for confirmation, perhaps even a formal, independent peer review.

(3) The nature of the work, its complexity, hazards, and uncertainties will determine the breadth of knowledge needed within the identification and confirmation team(s). It is important that the criteria for selecting team members reflect

4. PROCESS ELEMENT 3: DEFINING AND AGREEING TO PROTOCOLS AND DOCUMENTATION REQUIREMENTS FOR THE TEAM(S).

a. Objective. To establish protocols, agreements, and documentation requirements for a credible and efficient Process.

b. Discussion. The degree of formality and the extent of documentation required will depend on the work and the following considerations: (1) the potential impact of the identified hazards and associated uncertainties of the work, (2) the complexity of the work, and (3) the quality and rigor required to provide confidence that the standards selected meet the performance expectations and objectives of the work.

The protocols should reflect the intention that the team(s) will perform most of their deliberations in face-to-face group meetings. If subgroups must be used, coordination responsibilities of the subgroups must be adequately defined.

c. Responsibilities.

(1) The Convened Group has the following responsibilities.

(a) Establish protocols and agreements for:

1 schedules and time limitations;

2 resolution of differing opinions within the Convened Group and the team(s);

3 interactions between the Convened Group and the team(s); and

4 interactions between the Convened Group and the Stakeholders

(b) Establish documentation requirements for:

1 definition of the work, hazards, and performance expectations and objectives;

2 the necessary and sufficient set of standards;

3 justification for the set's adequacy:

a team member names, responsibilities, and qualifications;

b results of the confirmation process;

c differing opinions and their resolution;

(2) Evaluate relevant sources of existing international, national, State, local, and work-specific standards including laws, regulations, orders, and procedures.

(3) Identify which standards constitute a necessary and sufficient set, including those standards that are legally required and other standards that are necessary to provide adequate protection of workers, the public, and the environment. The set must be feasible for implementation.

(4) If needed, request additional resources, such as additional Technical or Operational Experts.

(5) Reach consensus on and justify the necessary and sufficient set of standards.

(6) Identify any implementation assumptions and interfaces used by the team.

(7) Identify those applicable Federal, State, and local laws and regulations that must be included in the necessary and sufficient set of standards but are judged not to add value to the achievement of adequate protection, and provide a justification for the team's view that can be used as the basis for pursuing exemption from these requirements.

(8) If it is not possible to identify a necessary and sufficient set to meet the current performance expectations and objectives, recommend revisions to the work definition, development of new standards, or both, that would allow a necessary and sufficient set of standards to be identified.

(9) Document:

(a) the necessary and sufficient set of standards,

(b) the justification for the set,

(c) implementation assumptions and interfaces, and

(d) a justification to support an exemption from regulatory requirements that are judged by the team not to add value to the achievement of adequate protection.

6. PROCESS ELEMENT 5: CONFIRMING THE NECESSARY AND SUFFICIENT SET OF STANDARDS.

a. Objective. To confirm the adequacy and feasibility of the necessary and sufficient set of standards identified by the Identification Team.

(c) the Confirmation Team has confirmed the adequacy and feasibility of the set of standards.

(2) Approve or disapprove the set of standards for use in performing the defined work, within any time limitations established by the Convened Group.

(3) Inform the Convened Group of the approval or disapproval.

10. Stakeholder. Any party other than Federal employees or DOE contractor or subcontractor employees that will be materially affected by, or can materially affect, the outcome of the work, either favorably or unfavorably (for example, representatives of State, and local governments, labor unions, and citizens' groups.

11. Technical Experts. Individuals with knowledge and expertise relevant to the work or to one of the environment, safety and health disciplines (for example, industrial hygiene, criticality control, or industrial safety).

APPENDIX B

Authorization for the N&S Process at LBNL

i. LBNL Request and Application

ii. DOE/ER Authorization to Proceed

iii. DOE/OAK Transmittal Letter

iv. Dr. Turner/Director Shank Announcement

v. Office of Waste Management Endorsement

REQUEST FOR APPLICATION OF THE NECESSARY AND SUFFICIENT PROCESS AT THE LAWRENCE BERKELEY NATIONAL LABORATORY

Description of Work:

This request is for application of the necessary and sufficient process site-wide at the Lawrence Berkeley National Laboratory (LBNL). The laboratory is located in a residential and campus setting adjacent to the University of California at Berkeley. The researchers at the laboratory include permanent staff scientists, visiting researchers, industry and academia research teams at User facilities, and graduate students.

LBNL is a multi-program laboratory and pursues a diverse range of non-defense related research. The core research strengths of the laboratory are:

- Energy Sciences (chemical sciences, earth sciences, energy and environment, material sciences);
- General Sciences (accelerator and fusion research, nuclear science, physics); and,
- Biosciences (life sciences, structural biology).

Underpinning and supporting the laboratory's research divisions are resource and operational divisions in:

- Engineering (facility design and construction management, experimental systems and detector fabrication, electronic and mechanical instrumentation, information and computing, general shops);
- Environment, Health and Safety (advanced dosimetry, radiation protection, fire department, environmental protection, waste management, health services); and
- Information and Computing Sciences (network development, information management, biostatistics, scientific imaging and visualization).

A wide range of hazards are associated with the diverse and complex nature of LBNL activities. The hazards associated with research are categorized as "low-hazard" and include: toxic solids and compressed gas, carcinogens, pyrophorics, lasers, ionizing radiation, and experimental amounts of radioactive material. The hazard associated with LBNL support and infrastructure operations include industrial hazards such as: cryogenics, high pressure, flammables, construction, and hoisting and rigging.

Basis for the Application:

The Oakland Operations Office and the Lawrence Berkeley National Laboratory perceive the following as the principle benefits which will accrue from application of the Necessary and Sufficient Process at the laboratory.

Overall, the N&S process will result in a more rational and efficient management of laboratory operations:

- The laboratory performs a wide and complex array of research which is funded and overseen by several different program offices. The N&S process will foster an integrated, site-wide approach to operations and ES&H management.
- The laboratory operates in a complex regulatory environment, including a state which has delegated authority from the EPA. The site-wide N&S process will develop disciplined and consistent methods for responding to regulatory agencies.

Additionally, the N&S process will enhance hazard communication and consistent understanding of requirements:

- The laboratory operates at the fore-front of science and has an extreme diversity of work and hazards. Application of the N&S process will greatly facilitate identification and characterization of diverse hazards, and lead to a clearly defined and accepted set of ES&H standards and requirements.
- The laboratory is located in a residential and campus community. The N&S process is a rational and positive way to expand laboratory and community dialog and understanding.
- The laboratory itself is composed of many different "communities" (staff scientists, visiting researchers from industry and academia, graduate students) with varying degrees of ES&H training and, importantly, experience with different ES&H systems and standards. The site-wide, researcher-lead N&S process will involve all laboratory "communities." This approach will impart a needed common understanding of ES&H standards among these "communities," and will promote consistent integration of ES&H into research planning and activities.

Finally, the N&S process will enhance a disciplined approach to performance-based management:

- The laboratory has been a leader in the development of performance-based management. The establishment of a set of agreed upon standards against which to benchmark and identify areas for ES&H improvement will add discipline to the laboratory's performance-based management methods.
- The laboratory and the DOE field elements (OAK and BSO) are partnering in major business re-engineering and related efforts to increase competitiveness. The benchmarking inherent in the N&S process of identifying hazards and appropriate standards will also indicate ES&H areas which have opportunity for streamlining and cost savings.

Schedule:

The site-wide N&S process at LBNL will build upon the experience of the successful N&S pilot for the National Tritium Labeling Facility (NTLF). Indeed,

considerable pre-planning has already been performed for the LBNL site-wide N&S process. Key personnel have been identified and the overall process has been charted (see attached diagram). In anticipation of the site-wide N&S effort, the majority of OAK and LBNL ES&H personnel completed DSC sponsored N&S training late last year. LBNL is ready to commence the site-wide N&S process as soon their application is selected.

The N&S process can progress through delivery of a confirmed set of ES&H standards by November 1, 1996. It is planned that the ES&H standards set will be approved by January 1, 1997, with contract modification completed as part of the negotiation to extend or compete.

Resources:

- The Process Team Leader will be Dr. Ben Feinberg, a LBNL senior researcher currently supported by ER Basic Energy Sciences. Other key persons managing the N&S process will be Dr. Jack Bartley, LBNL principle point of contact, and Philip Roebuck, PE, DOE-BSO principle point of contact.
- The staffing for the standards identification committee will be drawn from LBNL and OAK ES&H organizations. The OAK and LBNL ES&H organizations are adequately staffed to support the N&S process and, as previously mentioned, the majority of LBNL and OAK ES&H staff have already received N&S process training.
- Following the successful model of the earlier NTLF pilot, the confirmation team will be composed of people from industry and from the DOE community with demonstrable expertise and credentials related to the types of operations performed at LBNL.
- David Short (LLNL) and Larry Coulson (FERMI) have already functioned as coaches to LBNL for N&S pre-planning. Because we anticipate that there will be a high demand for coaches and particular coaches may not always be available, we anticipate utilizing a combination of Drs. Short, Coulson and Parzyck (ANL) for coaching support. Drs. Bartley and Williams of LBNL are also certified as coaches from their leadership of the National Tritium Labeling Facility pilot. Additionally, the OAK Standards Manager, Charles Simkins, PE, is available to advise and support the LBNL site-wide N&S effort.

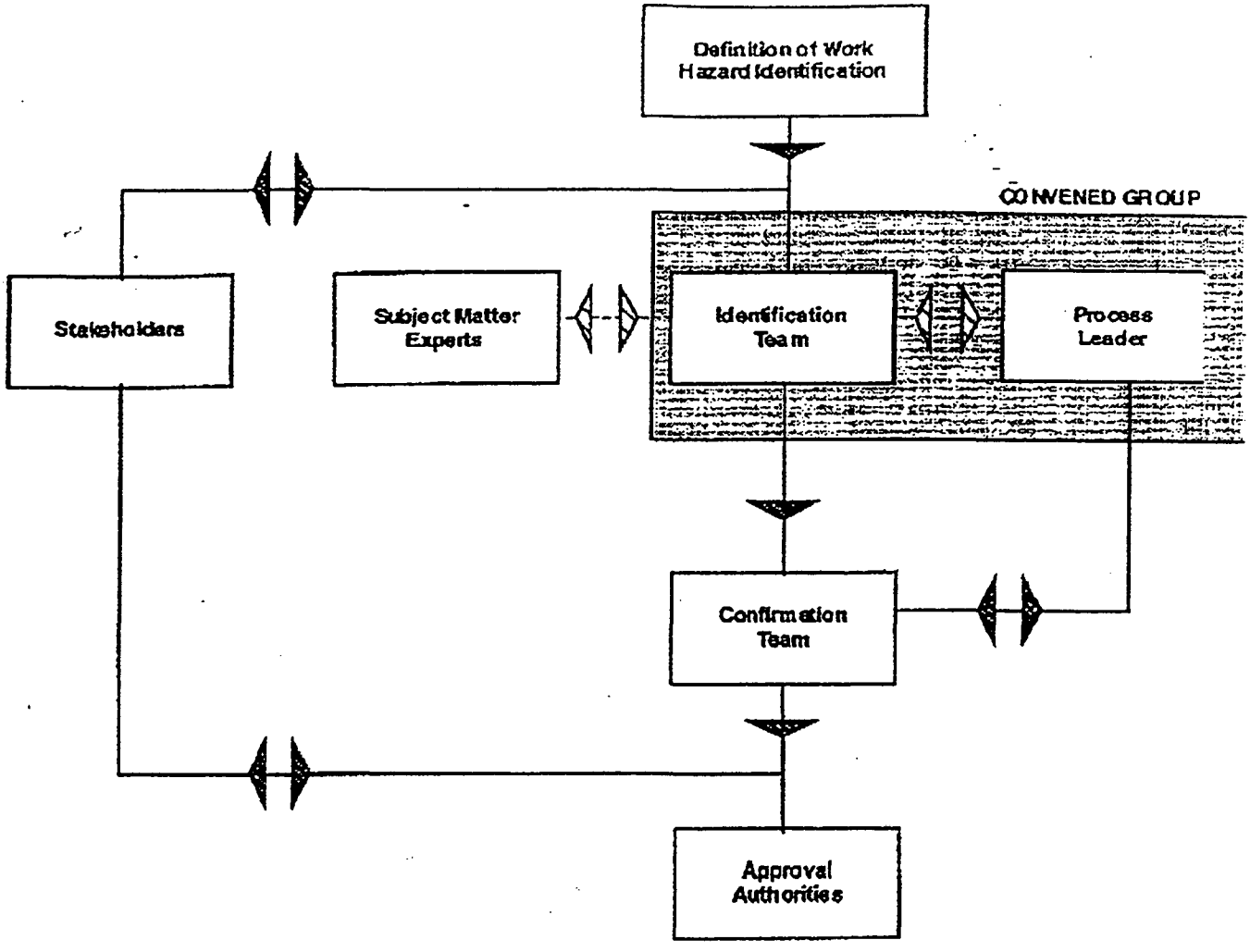
The estimated resource cost for the LBNL site-wide N&S process is 10 FTE-years plus additional costs of $400K. Individual elements of the additional costs are:

Coaches (1 FTE-year)	$200K
Process Leader (0.75 FTE- year)	$150K
Confirmation Team (10 people-one day plus travel)	$20K
Other/Contingency	$30K
Total Additional Costs	$400K

Other Information

This paper has outlined the benefits which the Oakland Operations Office and the laboratory believe will accrue from application of the N&S process at Lawrence Berkeley National Laboratory. This paper has also described the process planning, personnel selection and training which has already been accomplished in preparation for the N&S process. The laboratory is ready to commence the N&S process. Timely evaluation and decision on this request will facilitate the transition from a pre-planning phase into the effective execution of the process.

LBNL Site Wide N&S Process



DOE F 1325.8
(08-93)

United States Government | Department of Energy

memorandum

4-22-96
FAXED TO:
-NOLAN (BSO)
- C. SIMKINS (ERD)
- HIRAHARA (AMSM

DATE: April 19, 1996

REPLY TO ATTN OF: ER-30

SUBJECT: Closure Process for Necessary and Sufficient

TO: James Turner, Manager, Oakland Operations Office

As the cognizant secretarial officer, I am authorizing the Oakland Operations Office to proceed with implementation of the Closure Process for Necessary and Sufficient ES&H Standards at Lawrence Berkeley National Laboratory. This implementation should be carried out with full fidelity to the Secretarial Policy DOE N 450.3 and the manual DOE M 450.3-1.

I am very pleased by the success of Laboratory and the Operations Office/Site Office in carrying out your previous pilot implementation, and I anticipate success in lab-wide implementation. Please contact Charlie Billups on (301)903-4097 to discuss ER assistance in this undertaking.

Martha Krebs

Martha A. Krebs
Director
Office of Energy Research

cc: Dick Nolan, LBNL
Chuck Shank, LBNL
John Yates, ER-7

Department of Energy
Berkeley Site Office
Lawrence Berkeley Laboratory
1 Cyclotron Road, MS 50B-3238
Berkeley, California 94720

MAY 0 3 1996

RECEIVED
MAY 0 7 1996
EH & S

Dr. Charles V. Shank
Director
Lawrence Berkeley Laboratory
One Cyclotron Road
Berkeley, California 94720

Subject: Closure Process for Necessary and Sufficient ES&H Standards

Dear Dr. Shank:

I am pleased to convey authorization from the Director, Office of Energy Research, to implement the Closure Process for Necessary and Sufficient ES&H Standards at Lawrence Berkeley National Laboratory. The ES&H technical staffs of both the Oakland Operations Office and Lawrence Berkeley National Laboratory have vigorously sought this authorization because they believe that the necessary and sufficient process will:

- enhance hazard communication and consistent understanding of requirements,
- enhance a disciplined approach to performance based management, and,
- result in a more rational and efficient management of laboratory operations.

I share their expectations. Furthermore, I believe that site-wide implementation of the necessary and sufficient process at this time is particularly opportune because it will facilitate an orderly approach to an integrated management system.

The selection of Lawrence Berkeley National Laboratory for site-wide implementation of the necessary and sufficient process was based, in part, on the successful National Tritium Labeling Facility pilot project. In the Laboratory's implementation of the site-wide necessary and sufficient process, I anticipate that the process will be consistent with Secretarial Policy and Department guidance, will build on the National Tritium Labeling Facility pilot project, and will be similarly successful.

Should you have any questions, please contact Phil Roebuck at 486-4363.

Sincerely,

James Hirahara

James Hirahara
Associate Manager
for Site Management

cc: James Turner, MO
R. Nolan, BSO
J. Juetten, ESHD
P. Hill, WMD
D. McGraw, LBNL
B. Feinberg, LBNL
J. Bartley, LBNL

BERKELEY LAB

Office of the Director

May 31, 1996

TO: Berkeley Laboratory and Oakland Operations Staff

We are pleased to announce that the Berkeley Laboratory has received authorization from Dr. Martha Krebs, Director, Office of Energy Research, to implement Necessary and Sufficient ES&H Standards sitewide. Necessary and Sufficient is a process by which the Berkeley Laboratory and the Department of Energy will mutually define the ES&H standards for the Laboratory.

With your help, our aim is to develop a set of ES&H standards appropriate to the work and hazards at the Berkeley Laboratory, provide an effective level of ES&H protection, and adopt proven and cost effective industry standards wherever practicable. The resultant set of ES&H standards will permit rational and efficient management of laboratory operations.

Perhaps more importantly, the N&S process will be a true DOE and Berkeley Lab partnership. We believe that the experience of this fresh, new approach will well prepare us to move on to new missions and challenges.

The process, after full implementation, is expected to result in a substantial reduction in ES&H costs to the Berkeley Laboratory while maintaining safe and environmentally responsible operations.

Several months of effort by the Laboratory and the Department will be required to complete the process. Please join us in helping to make this transition to a rational and efficient ES&H process successful.

Martin J. Dorazio

for James M. Turner
Manager, DOE-OAK

K Berkner

for Charles V. Shank
Director, Berkeley Laboratory

DOE F 1326.8
(8-89)
EFG (07-90)

United States Government

memorandum

Department of Energy

RECEIVED
SEP 19 1996
Waste Management

DATE: SEP 13 1996

REPLY TO ATTN OF: EM-34

SUBJECT: The Office of Waste Management Endorsement of the Work Smart Standards Process at the Lawrence Berkeley Laboratory

TO: Phil Hill, Waste Management Division Director, Oakland Operations Office

The Office of Waste Management (EM-30) is committed to the protection of our workers, the public and the environment. In 1994, the Department of Energy published a report "Criteria for the Department's Standards Program" (DOE/EH/0416), which outlined the "necessary and sufficient" process. The objective of this process is the development of standards, that when implemented, provide reasonable assurances that worker, public, and environmental safety and health are protected. These standards are now being called "Work Smart Standards."

This memorandum is to inform you that EM-30 believes that the Work Smart Standards process is appropriate for the work being performed at the Lawrence Berkeley Laboratory, and endorses the development of appropriate standards that maintain an adequate level of protection.

Per our conversation, the Office of Central Operations would like to be involved, as appropriate. If you have any further questions or comments, please do not hesitate to call John Neave (301) 903-7678, or Gordon Langlie (301) 903-7119 of my staff.

James A Fitzsimmons for

Mark W. Frei, Director
Office of Central Operations
Office of Waste Management
Environmental Management

APPENDIX C

Process Description at LBNL

i. Director Shank's Letter to the Identification Team

ii. Convened Group Charge to the Identification Team

iii. Convened Group Charge to the Confirmation Team

Ernest Orlando Lawrence
Berkeley National Laboratory
1 Cyclotron Road Berkeley, California 94720
Office of the Director
Building 50A, Room 4119
(510) 486-5111 • Fax: (510) 486-6720

July 3, 1996

TO: Berkeley Lab Identification Team Members

Thank you for your willingness to participate in the LBNL Necessary and Sufficient Process as a member of the Identification Team.

As you know, the purpose of the Necessary and Sufficient Process is to develop a set of ES&H standards* appropriate to the work and hazards at the Berkeley Laboratory, provide an effective level of ES&H protection, and adopt proven and cost effective industry standards wherever practicable. To accomplish this extensive and complex task, we have selected highly qualified professionals from the Department of Energy and the Berkeley Laboratory to form a multi-disciplinary Identification Team. As an Identification Team member and participant in the N&S process, we ask that you commit your full technical expertise and experience to:

- Produce a set of standards which will provide adequate ES&H protection;
- Bring the product together on schedule;
- Build on the DOE OAK and LBNL partnership; and
- Follow the process guidelines to fulfill the criteria for the Department's Standards Program.

Several months of effort will be required to complete the process. With your support, the N&S process will be successful and, moreover, will lay the foundation for a new way of doing business at the Department and the Laboratory.

Charles V. Shank
Director

*The official DOE name is "Work Smart Standards."

Convened Group Charge to the Identification Team

We are pleased that you have agreed to contribute your time and talent to the LBNL Necessary and Sufficient Process leading to Work Smart Standards for ES&H. The task is challenging -- develop a set of ES&H standards which are appropriate to the work performed by Berkeley Laboratory, provide an effective level of ES&H protection, and adopt proven and cost effective industry standards wherever practicable.

The Department's Description for the Necessary and Sufficient Closure Process charts the overall approach to Work Smart Standards and assigns certain responsibilities to the Identification Team. Primarily the Identification Team is tasked to:

- Acquire the information needed to define the work and hazards.
- Identify applicable laws and regulations (necessary standards).
- Determine what additional standards are needed to meet the needs of the work and goals (sufficient standards).
- When requested by the convened group, liaison with stakeholders to inform them of the process and evaluate their concerns.
- When requested by the convened group, defend the standards set to independent review teams and approval authorities.

The sources of standards, in addition to applicable laws and regulations, include consensus international and national standards (ISO, ANSI, IEEE, etc), DOE Orders and Guidance documents, and LBNL standards. In selecting standards, primary consideration should be given to how well the standard relates to the work. In the event of equivalent standards for the work, preference should be given to the standard which is more generally recognized and accepted. In the event that no standards exists, the Convened Group should be consulted regarding the development of a standard.

The standards set should represent the consensus of the members of the Identification Team. Consensus is arrived at through a negotiation process which identifies the set of standards which each team member considers adequate and acceptable. Conflict resolution should be based on the assumption that the Identification Team is composed of "reasonable people." Consequently, if one team member will not commit to support a decision, the team should recognize the team member as a reasonable person and listen and understand the team member's concerns. Once the team understands the concerns, satisfactory resolution of the concerns may follow. On the other hand, if the concerns are not fully resolved, the team member should recognize the team as reasonable people and consider supporting their recommendation as generally acceptable (but perhaps not ideal).

The principal contact between Identification Team Members and the Convened Group will be the Process Team Leader, although any Identification Team member may appeal any issue to the Convened Group for consideration. The Process Team Leader will inform the Convened Group of any resources needed by the Identification Teams (such as subject matter experts and reference standards).

Convened Group Charge to the Confirmation Team

We are pleased that you have agreed to contribute your time and talent to the LBNL Necessary and Sufficient Process leading to Work Smart Standards for ES&H. The task is challenging -- develop a set of ES&H standards which are appropriate to the work performed by Berkeley Laboratory, provide an effective level of ES&H protection, and adopt proven and cost effective industry standards wherever practicable.

The Department's Description for the Necessary and Sufficient Closure Process charts the overall approach to Work Smart Standards and assigns certain responsibilities to the Confirmation Team. Primarily the Confirmation Team is tasked to:

- Review the information available to and used by the Identification Team.
- Confirm that the set is necessary and sufficient to assure safe, efficient, cost effective operation.
- Confirm that implementation of the set of standards will be feasible.
- Confirm that the process used is in accordance with the elements of the DOE Closure Process for Necessary and Sufficient Sets of Standards

The sources of standards, in addition to applicable laws and regulations, include consensus international and national standards (ISO, ANSI, IEEE, etc), DOE Orders and Guidance documents, and LBNL standards. The standards set should represent the consensus of the members of the Identification Team In confirming standards, primary consideration should be given to how well the standard relates to the work.

The principal contact between Confirmation Team Members and the Convened Group will be the Process Leader. The Process Leader will inform the Convened Group of any resources needed by the Confirmation Team (such as subject matter experts and reference standards).

APPENDIX D

Schedule and Calendar for the N&S Closure Process at LBNL

N&S IFA Teams and ID Teams Schedule - 1996

DIVISIONS	Wk. of: 6/3	6/10	6/17	6/24	7/1	7/8	7/15	7/22	7/29	8/5	8/12	8/19	8/26	9/2	9/9	9/16	9/23	9/30	10/7	10/14	10/21	10/28	11/4	11/11	11/18
NERSC																									
Operations																									
Engineering																									
Facilities																									
NSD																									
EHS																									
AFRD																									
PHY																									
CSD																									
MSD																									
E&E																									
SBD																									
ESD																									
LSD																									
ID TEAMS																									
CORE																									
ACCEL																									
LAB SAFETY																									
ENV																									
FACIL																									
REVIEW TEAMS																									
CONFIRMATION TEAM																									
STAKEHOLDERS																									
APPROVAL																									

N&S Milestones *revised 11/7/96*

Week:	7/15	7/22	7/29	8/5	8/12	8/19	8/26	9/2	9/9	9/16	9/23	9/30	10/7	10/14	10/21	10/28	11/4	11/11
CG		Calls to Conf.	Calls to alt'nate. Conf. S/H mtg.	1st lett. to Rev. 1st lett. to Conf. O'Toole				Draft Std. to Rev'w. Team	Draft Std. to Conf. Team	Conf. call w/ Conf. Team	Revise Std.			Revise Std. Set to S/H			Resp. to S/H com'nt Send for App'l.	
IFA Teams	Final EHS	B: NSD, ESD, E&E, AFRD, Facil. Final SBD, Phys	Begin CSD Op'ns. Draft MSD	Final NERSC Eng. MSD Draft LSD	Final LSD	Draft Facil., Op'nsN SD, AFRDC SD, E&E, ESD	Final Facil., Op'ns., NSD, AFRD, CSD, E&E, ESD											
Core Team	1st Core mtg.							Draft Std. to CG			Revise Std.			Revise Std.			Final Std. to CG Resp. to S/H com'nt	
Lab Safety Team			Begin Std. ID					Draft Std. to Core		Comple te Draft Stds.	Revise Std.			Revise Std.	Final Std. to Core		Resp. to S/H com'nt	
Facil. Team		Begin Std. ID						Draft Std. to Core		Comple te Draft Stds.	Revise Std.			Revise Std.	Final Std. to Core		Resp. to S/H com'nt	
Accel. Team		Begin Std. ID						Draft Std. to Core		Comple te Draft Stds.	Revise Std.			Revise Std.	Final Std. to Core		Resp. to S/H com'nt	
Env. Team			Begin Std. ID					Draft Std. to Core		Comple te Draft Stds.	Revise Std.			Revise Std.	Final Std. to Core		Resp. to S/H com'nt	
Rev. Teams	Meet w/ teams			1st lett. to Review Teams						Rec've. Draft Std. & Mtg.	Rev'w. com'nt s to CG				Final Std. to Core			
Conf. Team		Calls to Conf.	Calls to alt'nate. Conf.	1st lett. to Conf. w/ M450.3			2ndlett. to Conf. w/ Charter			Rec've. Draft Std. Conf. call w/ CG	com'nt to CG	Rev. Std. to Conf.	Conf. mtg.					
Stake-holder			S/H mtg.				Rdg Rm.			Rec've. Draft Std.			Peer rvd Std.	S/H mtg.			Return to CG	
App'l.																		p'l.

Calendar

Berkeley Lab
Necessary & Sufficient Standards Project

LEGEND

Italics = Meeting

MAY

5/16/96 *First Integrated Functional Analysis Team (IFA) Meeting*

5/22/96 *First 'Convened Group' Meeting* 90-2063, 1-5pm

5/23/96 *Integrated Functional Analysis Team (IFA) Meeting*

5/29/96 *'Convened Group' Meeting*

5/30/96 *Integrated Functional Analysis Team (IFA) Meeting*

5/31/96 *"N&S Kick-Off Meeting"*
Content: Director Shank: 7 Principles including N&S; M.Domagala (Dep.Mgr OAK): DOE endorsement, expectations; B.Feinberg: Outline N&S Process @ LBNL, Fermi Lab experiences; Phil Williams: N&S at NTLF.

5/31/96 Currents Article on N&S at LBNL

JUNE

6/3/96 IFA Hazards Analysis Teams begin inventory of Physics and Structural Biology Divisions.

6/5/96 *'Convened Group' Meeting*

Integrated Functional Analysis Team (IFA) Meeting

6/10/96 IFA Hazards Analysis Team begins inventory of EH&S Division.

6/12/96 *'Convened Group' Meeting*

6/13/96 *Integrated Functional Analysis Team (IFA) Meeting*

6/19/96 *'Convened Group' Meeting*

6/20/96 *Integrated Functional Analysis Team (IFA) Meeting*

6/24/96 IFA Hazards Analysis Teams begin inventory of Engineering and Materials Science Divisions.

6/26/96 *'Convened Group' Meeting*

6/27/96 *Integrated Functional Analysis Team (IFA) Meeting*

JULY

7/1/96 IFA Hazards Analysis Team begins inventory of Life Sciences Division.

7/3/96 *'Convened Group' Meeting*

7/8/96 IFA Hazards Analysis Team begins inventory of NERSC Division.

7/10/96 *'Convened Group' Meeting*

7/11/96 *Integrated Functional Analysis Team (IFA) Meeting*

7/12/96 Invitation letters to Stakeholders sent out.

7/15/96 *Core Standards Identification Team Meeting*

7/17/96 *'Convened Group' Meeting*

7/18/96 *Integrated Functional Analysis Team (IFA) Meeting*

7/22/96 IFA Hazards Analysis Teams begin inventory of the following Divisions: Nuclear Science, Earth Science, Energy & Environment, Accelerator & Fusion Research, and Operations (includes Lab Facilities), and finalize the SBD Report.

Week of 7/22/96 ID Sub-Teams: Accelerator and Fixed Radiation Sources, and Facilities/Operations to begin Std ID

Week of 7/22/96 CG to contact Confirmation Team members

7/23/96 *Core Standards Identification Team Meeting*

7/24/96 *'Convened Group' Meeting*

7/25/96 *Integrated Functional Analysis Team (IFA) Meeting*

7/25/96 *Accelerator and Fixed Radiation Sources ID Team Meeting*

7/26/96 *Facilities and Infrastructure ID Team Meeting*

7/29/96 IFA Hazards Analysis Team begins inventory of Chemical Sciences Division, finishes MSD & LSD.

Week of 7/29/96 ID Sub-Teams: Lab Safety and Environmental Protection to begin Std ID **7/31/96** *'Convened Group' Meeting*

7/31/96 *First Stakeholders meeting* - presentation of the process and goal (evening meeting).

7/31/96 Maggie Sturdivant to visit LBNL - tour of N&S project

AUGUST

8/1/96 *Integrated Functional Analysis Team (IFA) Meeting, Environmental Protection ID Team Meeting, Lab Safety ID Team Meeting*

8/2/96 Currents Article to update Lab community on N&S project

8/2/96 Interactive form on N&S website to allow research community to comment on requirements that hinder the work

Week of 8/5/96 First letter to Confirmation Team (w/ M 450.3) & Internal Review Teams to go out. Follow-up letter w/ viewgraphs to Stakeholders not attending 7/31/96 mtg.

Week of 8/5/96 IFA Hazards Analysis Team finishes NERSC, MSD & Eng. Div. and draft of LSD report.

8/7/96 *'Convened Group' Meeting* Database ready for O'Toole demonstration

8/7/96 *Environmental Protection ID Team Meeting, Lab Safety ID Team Meeting*

8/8/96 N&S Presentation/tour for Tara O'Toole: NTLF, HGC, ALS

8/8/96 *Accelerator and Fixed Radiation Sources ID Team Meeting, Facilities/Infrastructure ID Team Meeting, IFA Team Leader Meeting with ID Team Leaders* Demo of IFA Database

8/12/96 *Lab Safety ID Team Meeting*

Week of 8/12/96 IFA Hazards Analysis Team finishes LSD report.

Week of 8/12/96 Standards ID Team database ready for data entry

8/13/96 *Lab Safety ID Team Meeting, Core Team Meeting*

8/14/96 *'Convened Group' Meeting, Environmental Protection ID Team Meeting*

8/15/96 *Integrated Functional Analysis Team (IFA) Meeting, Facilities/Infrastructure ID Team Meeting, Accelerator/Fixed Radiation Sources ID Team Meeting*

8/15/96 *DOE Directives Standards Committee Meeting in Wash., D.C.*

Week of 8/19/96 Set up Reading Room for Stakeholders

Week of 8/19/96 All IFA Hazards Analysis Team draft reports to ID Team

Week of 8/19/96 Convened Group contacts to call appointed Confirmation Team members to follow up on questions

8/21/96 *Environmental Protection ID Team Meeting; 'Convened Group' Meeting* review repts for S/H Rdg. Rm., 2nd Confirmation Team ltr. requesting bios, send Charter and charge to team.

8/22/96 *Integrated Functional Analysis Team (IFA) Meeting, Facilities/Infrastructure ID Team Meeting, Accelerator/Fixed Radiation Sources ID Team Meeting*

Week of 8/26/96 All IFA Hazards Analysis Team final reports to ID Team and available to Stakeholders

8/27/96 *Core Team Meeting, Accelerator/Fixed Radiation Sources ID Team Meeting*

8/28/96 *Environmental Protection ID Team Meeting; 'Convened Group' Meeting* Approve final Charter for 9/2/96 Confirmation Team use

8/29/96 *Integrated Functional Analysis Team (IFA) Meeting, Facilities/Infrastructure ID Team Meeting, Accelerator/Fixed Radiation Sources ID Team Meeting*

SEPTEMBER

9/2/96 Confirmation Team to receive DOE process requirements summary and Berkeley Lab process description (430.1 and Charter)

9/2/96 The Four Standards Identification Sub-Teams (Laboratory Safety, Environmental Protection, Facilities & Infrastructure, Accelerators & Fixed Radiation Sources) to deliver the initial Std set to Core Team.

9/3/96 *Core Team Meeting* All-day meeting to review draft Std. set

9/3/96 Confirmation Team to begin.

9/4/96 *'Convened Group' Meeting, 1/2-day Core Team Mtg.*

9/5/96 *Facilities/Infrastructure ID Team Meeting, Accelerator/Fixed Radiation Sources ID Team Meeting*

9/6/96 *'Convened Group' Meeting*

9/9/96 *Facilities/Infrastructure ID Team Meeting, Accelerator/Fixed Radiation Sources ID Team Meeting*

9/9/96 Draft Std set and rationale to Internal Review Team and Confirmation Team, and available for Stakeholder review

9/10/96 *Core Team Meeting*

9/12/96 *Facilities/Infrastructure ID Team Meeting, Accelerator/Fixed Radiation Sources ID Team Meeting*

9/12/96 Begin individual Confirmation Team member visits

9/13/96 ID Team completes draft set (Core Team and Sub-Teams)

9/13/96 *'Convened Group' Meeting, Core Team Meeting*

9/16/96 Draft Set to Review Teams, Confirmation Team, and Stakeholders Reading Rooms (includes ID Team forms, Charter, info on ES&H Mgmt., Legal info, "N" vs "S" ratings)

9/16/96 *DOE ESH Policy Group Meeting* Ben Feinberg and Jack Bartley to attend

9/17/96 *Core Team Meeting*

9/18/96 *'Convened Group' Meeting*

9/20/96 *Monthly Lab Safety Review Committee Meeting* Ben Feinberg and Jack Bartley to attend

9/23/96 *Confirmation Team Conference Call* (AM)

9/23/96 *Radiation Protection Issue Meeting*

9/23/96 Internal Review Team to comment back to Convened Group (DOE ESH Policy & LSRC)

Week of 9/23/96 ID Sub-Teams to revise Standard Set as needed per input from Internal Review Teams, Convened Group, Confirmation Team, and Stakeholders.

9/24/96 *Core Team Meeting*

9/25/96 Confirmation Team comments on major problems due to Convened Group

9/25/96 *'Convened Group' Meeting* Finalize ID Team Narrative Reports

9/30/96 Confirmation Team and Stakeholders Reading Rooms to receive revised Standards Set with ID Team Narrative Reports from Convened Group

OCTOBER

10/1/96 *Core Team Meeting*

10/2/96 *'Convened Group' Meeting* Prepare Stakeholder Meeting

10/7/96 - 10/8/96 Confirmation Team to confirm Standard Set. 2-day visit to LBNL

10/9/96 *'Convened Group' Meeting* Review draft K mod ltr agreement and start process for Approval Team signature

10/11/96 Peer reviewed draft standard set w/ Narratives & finalized Charter available for Stakeholders

10/11/96 Draft Final Report Contents due to TEID (except outstanding issues and standards set)

10/16/96 *Second Stakeholders' Meeting* - Present peer-reviewed draft Standard Set and request comments

10/16/96 *'Convened Group' Meeting*

Week of 10/21/96 Enter Stakeholder issues into N&S Database

Week of 10/21/96 ISMS Team to report conclusions on ESH Orders to Convened Group

Week of 10/21/96 Core Team to receive Final Standards Sets from ID Teams

10/23/96 *'Convened Group' Meeting*

10/30/96 *'Convened Group' Meeting*

NOVEMBER

11/1/96 Draft Final Report due to TEID

11/6/96 *'Convened Group' Meeting*

11/6/96 Stakeholder comments due

11/6/96-11/8/96/96 Enter Stakeholder issues into N&S Database

11/6/96-11/8/96 Convened Group to coordinate responses to Stakeholders' comments on the Standards Set

11/6/96-11/8/96 ID Teams to address Stakeholder issues in N&S database

11/8/96 *'Convened Group' Meeting*

11/11/96 Final Standards Set due to Convened Group

11/13/96 LBNL N&S Contract Modification and Final Report signed by the Agreement Parties.

APPENDIX E

Curriculum Vitae Materials

i. Process Leader

ii. Convened Group Members

iii. Identification Team Members

iv. Confirmation Team Members

v. Technical and Process Experts

i. Process Leader

BIOGRAPHICAL SKETCH

Benedict Feinberg

Education:

B.S., (Physics) University of Rochester, 1969
Ph.D. (Plasma Physics) Columbia University, 1974

Professional Certification(s)/ Societies:

Faculty Fellowship, Columbia University
American Physical Society
American Association for the Advancement of Science
IEEE Affiliate, Nuclear Science & Plasma Physics

Current Position:

Senior Staff Physicist, Lawrence Berkeley Laboratory
Head of Operations, Advanced Light Source Center

Previous Experience:

8/76 - 9/82	Staff Physicist, Lawrence Berkeley Laboratory. Member of the Magnetic Fusion Energy Group.
9/82 - 6/83	Visiting Scientist, Laboratoire National Saturne, Saclay, France.
7/83 - 12/83	Staff Physicist, Lawrence Berkeley Laboratory. Member of Magnetic Fusion Energy Group.
1/84 - 9/88	Staff Physicist, Lawrence Berkeley Laboratory. SuperHILAC Accelerator Physicist.
10/88 - 9/89	Staff Physicist, Lawrence Berkeley Laboratory. Bevalac Planning and Development Section Leader and Deputy Group Leader.
10/89 - 3/93	Senior Staff Physicist (8/92 on), Lawrence Berkeley Laboratory. Bevalac Group Leader (Acting, through 12/90) and Planning and Development Section Leader. Principal Investigator for Bevalac Operations.
4/93 - Present	Senior Staff Physicist, Lawrence Berkeley Laboratory. Head of Operations, Advanced Light Source Center.

NAME:
JOHN C. BARTLEY

EDUCATION:
University of California, Davis, California, Ph.D., 1963
University of Illinois, Urbana, Illinois, V.M.S., 1960
Colorado State University, Fort Collins, Colorado, D.V.M., 1956
Colorado State University, Fort Collins, Colorado, B.S., 1954

PROFESSIONAL SOCIETIES:
Biochemical Society (1966 to present)
American Society of Biological Chemists (1978 to present)
American Association for the Advancement of Science (1981 to present)
American Society of Cell Biologists (1985 to present)

COMMITTEES:
LBNL Safety Review Committee (1988 to present)
LBNL Tiger Team Task Force - Head Environmental Assessment Group (1990 to 1991)

PROFESSIONAL EXPERIENCE:

USPHS Postdoctoral Fellow
Department of Physiology and Anatomy
University of California, Berkeley 1963 - 1966

Assistant/Associate Professor of Clinical Sciences
University of California, Davis 1966 - 1968

Assistant Director of Research
Bruce Lyon Memorial Research Laboratory
Children's Hospital Medical Center of Northern California, Oakland 1968 - 1978

Staff Scientist
Division of Biology and Medicine/Cellular and Molecular Biology
Lawrence Berkeley Laboratory
University of California, Berkeley 1982 - 1990

Deputy Director, Human Genome Center
Lawrence Berkeley Laboratory
University of California, Berkeley 1987 - 1990

Deputy Director
Environment, Health and Safety Division
Lawrence Berkeley Laboratory July, 1990 - Present

ii. Convened Group Members

CHARLES B. SIMKINS, P.E.

BS Mechanical Engineering- U.C. Berkeley 1971.

Professional Mechanical Engineer- California M18329.
Certificate in Hazardous Materials Management - U.C. Berkeley extension program 1994.

Environmental Management Division, Oakland Operations Office. Responsibilities include:

- Manager for Surplus Facility Inventory and Assessment program
- Manager for Future Use Planning for EM Division
- Lead for ES&H/QA compliance for Nuclear Energy Division programs. QA experience in NQA-1 and 5700.6C; participated in nine NQA-1 audits.
- Member of Conduct of Operations review at LLNL
- Member of Operational Readiness Review validation team for Sodium Component Test Installation restart and Kalina facility start-up at Energy Technology Engineering Center.
- Member of Operational Readiness Review team for Advanced Light Source start-up at LBL.
- Technical Standards Manager for Oakland Operations Office.
- OAK Alternate on Department Standards Committee.
- OAK representative to Department Safety Management Implementation Team.

Previously, twenty-five years experience as Mechanical Engineer, primarily in heavy industrial applications. Technical experience in design and construction of piping and material handling systems as well as controls and instrumentation. Experience in program and departmental management at small private consulting engineering companies.

Curriculum Vitae

Klaus Hans Berkner

Education: S.B. (Physics) Massachusetts Institute of Technology (1960)
Ph.D. (Physics) University of California, Berkeley (1964)

Current Position:
Deputy Director for Operations
Ernest Orlando Lawrence Berkeley National Laboratory

Previous Positions at Lawrence Berkeley National Laboratory:

1964-1975	Physicist in the Magnetic Fusion Energy (MFE) Atomic Physics Group and the Neutral Beam Development Group
1976-1982	Head of Operations for the Neutral Beam Group
1980-1984	Principal Investigator and Project Manager of the Neutral Beam System Test Facility (NBSTF) and its upgrade to the Neutral Beam Engineering Test Facility (NBETF)
1982-1984	Deputy Director, Accelerator and Fusion Research Division (Acting Director, 11/82-6/83)
1984-1985	Acting Director, Accelerator and Fusion Research Division
1985-1991	Director, Accelerator and Fusion Research Division
1991-94	Associate Laboratory Director for Operations
1994-Present	Deputy Director for Operations

Professional Societies & Fellowships:

- Fellow, American Physical Society: Division of Plasma Physics; Division of Atomic, Molecular, and Optical Physics; Division of Beam Physics; (Executive Committee, 1994-97) Fusion Power Associates
- National Science Foundation Graduate Fellowship at UC Berkeley (1960-61)
- National Science Foundation Post-Doctoral Fellowship at UKAEA Culham Laboratory, Culham, U.K. (1965-66)

Recent Committee Memberships:

Scientific Advisory Committee, Pohang (Korea) Light Source, (1988-95)

Special Advisory Committee for Advanced Photon Source Construction, University of Chicago Board of Governors for Argonne National Laboratory (1989-96)

Particle Accelerator Conference Organizing Committee (1989-95), Program Committee Chair

DOE Fusion Energy Advisory Committee (1991-94). Chair of Panel 6: Neutron Interactive Materials Program

DOE Basic Energy Sciences Advisory Committee (1991-96). Co-chair (1993-96).

Advisory Committee, Los Alamos National Laboratory Neutron Science Center (1995-present)

Laboratory Operations Coordinating Committee (ANL, BNL, LBNL, ORNL, PNNL) 1991-present

SLAC Scientific Program Council; Chair of EHS subcommittee

BIOGRAPHICAL SKETCH

HOWARD HATAYAMA

Mr. Hatayama is currently the Director of Environment , Safety and Health (ES&H) for the University of California, Office of the President, Laboratory Administration Office. In this capacity, he is responsible for administering the Environment, Safety and Health aspects of the University's contract with the U.S. Department of Energy to manage and operate Lawrence Berkeley Laboratory, Lawrence Livermore National Laboratory, and Los Alamos National Laboratory. His duties include implementing performance based management in the ES&H area, establishing University wide policies and positions on various ES&H issues, building effective partnerships among the parties to the contract, and providing general corporate ES&H oversight.

Mr. Hatayama is an instructor in the Environmental Management Program at the University of California, Berkeley Extension and serves on the UCB Extension Advisory Council. He is also on the Board of Directors of the National Safety Council.

Prior to joining the University, Mr. Hatayama served as the Regional Administrator for the California Department of Toxic Substances Control, Region 2 for four years. He was responsible for administering the hazardous waste management laws and programs in a 15 county area stretching along the coast from Monterey to the Oregon border. He accomplished this through a staff of 160 scientists, engineers and support personnel engaged in permitting hazardous waste facilities, enforcement of hazardous waste laws, and remediation of hazardous waste sites. Mr. Hatayama was the Chief of Site Mitigation prior to assuming the duties of Regional Administrator and was responsible for overseeing the remediation of more than 70 State superfund sites and for administering over $10 million in remediation contracts.

In his 18 years as a professional in the environmental field. Mr. Hatayama has also worked as a project officer for the California Department of Health Services, a researcher for the U.S. Environmental Protection Agency, and as a consultant to Organization for Economic Cooperation and Development (Paris), the World Health Organization (Copenhagen), the Associazione Ambiente e Lavoro (Milan), and the County of Contra Costa (California).

Mr. Hatayama is a Registered Professional Engineer. He holds a Bachelor of Science in chemistry from Claremont McKenna College and a Masters of Science degree in sanitary engineering from the University of California at Berkeley.

His awards include a fellowship from the North Atlantic Treaty Organization, Committee on Challenges of a Modern Society to participate in an international study of contaminated land, a Sustained Superior Accomplishment Award from the California Department of Health Services, and Special Assembly Resolution from the California Assembly commending his service.

Phillip E. Hill

Bachelor Degree in Biology

Director, Waste Management Division, DOE Oakland Operations Office (OAK). Mr. Hill has twenty years of diverse ES&H experience with OAK. Prior to his current position, he was assigned to the OAK division responsible for evaluation and assessment of Contractors ES&H program to ensure protection of the workers, the public, and the environment. A radiation and nuclear safety specialist, Mr. Hill participated in a number of reviews including ES&H appraisals, operational readiness reviews, and investigations.

8/23/95 1:28 PM

NAME:

- David C. McGraw

CURRENT POSITION:

- Division Director, Environment, Health & Safety Division, LBNL.

EDUCATION:

- B.Ed., University of Calgary, 1967 (Biology/Chemistry major).
- M.Sc., University of Calgary, 1974.
- M.P.H., University of California, Berkeley, 1982.

ADVANCED CERTIFICATES:

- Professional Biologist, Province of Alberta since 1979.
- Registered Environmental Auditor, State of California (#REA-1807).

EXPERIENCE:

- Chairman of Environmental Sciences Department, Mount Royal College, Calgary, Alberta, 1975 - 1981.
- Manager of EH&S at IBM, 1982 - 1989.
- Senior Corporate Manager of EH&S at Apple Computer, 1989 - 1991.
- EH&S Division Director at LBNL, 1991 - Present.

RICHARD NOLAN

B.S./M.S. Public Administration

Site Manager, U.S. DOE Berkeley Site Office. Twenty-seven years experience in DOE program management of defense and energy research. Previous assignments include:

- Deputy Director, DOE Site Selection Task Force for Superconducting Super Collider
- Director, DOE Weapons Facility Modernization Site Evaluation Team
- Director, Energy Research Division, Oakland Operation Office
- Director, Office of Communications and Planning, Oakland Operation Office

PHILIP ROEBUCK

BS Mechanical Engineering
Masters in Business Administration

Professional Engineer (California, Colorado, Illinois, Nebraska, Oregon, Washington)

Basic Energy Sciences Program Engineer, seven years with DOE. BSO functional expert on hazard assessment and safety analysis, and facility modification and experiment review.

Experience also includes member of the Energy Research Safety Documentation Working Group, and DOE Readiness Review Team Leader for the Advanced Light Source. Previously, fifteen years engineering experience in private industry including design, modification, and commissioning of a wide range of power generating, military, and process facilities.

Fermi National Accelerator Laboratory
P.O.Box 500 • Batavia, IL. • 60510-0500
708-840-5242 Fax: 708-840-2939

Director's Office

June 14, 1996

Larry Coulson

Education:
Ph.D. in Physics
BS in Physics

Certification (s):
(none)

Current Position:
Assistant Director at Fermi National Accelerator Laboratory, 2 years

Previous ES&H Experience:
Process Leader for the Fermilab N&S Pilot
Assistant Director for ES&H, Superconducting Super Collider, 5 years
Safety Section Head, Fermilab, 11 1/2 years
Assistant Safety Section Head, Fermilab, 4 1/2 years
Radiation Physics Group Leader, Fermilab, 3 years
Radiation Physics Group Staff, Fermilab, 3 years

DEVAUGHN R. NELSON

PhD Physics
BA & MS Physics

Health Physicist, DOE Office of Energy Research, Safety and Health Division, ten years. Working group activities includes:

- Department Standards Committee SPAT 12 "Implementation"
- SMS Guidance Group
- DOE Orders 5480.11, "Radiation Protection of Occupational Workers," and 5480.25, "Safety of Accelerator Facilities"

Previous experience includes:

USEPA - Federal Guidance: Exposure of Workers and Diagnostic use of X Rays, twelve years
USAEC - Environmental Project Manager, two years
ORNL - Radiation Physics Research, thirteen years

David W. Short	"Coach" for Closure Process Application
Education:	BS Met.E. (Metallurgical Engineering) MS in Metallurgical Engineering PhD
Current Position:	Program Manager, Integrated Safety Management System/Work Smart Standards for LLNL
Previous Experience:	Leader of laboratory, contractor and DOE process action team that designed and tested the closure process for necessary and sufficient sets of standards. Twenty years of scientific and technical efforts in various roles as materials scientist, engineer, project engineer, group and section leader, accelerator facility manager, quality assurance manager, and project/program manager at LLNL. Over ten years experience as researcher, instructor, and system analyst/designer in university , commercial, and military organizations.
Other N&S Team activities	All pilot demonstrations of the N&S process and several second round applications.

BIOGRAPHICAL SKETCH

Give the following information for key personnel and consultants and collaborators. Begin with the principal investigator/program director. Photocopy this page for each person.

NAME	POSITION TITLE
Philip G. WILLIAMS	Co-Principal Investigator Adjunct Asst. Professor, UCSF Staff Scientist, Structural Biology Division, LBL

EDUCATION *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of New South Wales, NSW, Australia	B.S.	1980	Chemistry
University of New South Wales, NSW, Australia	Ph.D.	1984	Nucl. & Rad'n Chemistry

RESEARCH AND PROFESSIONAL EXPERIENCE: Concluding with present position, list, in chronological order, previous employment, experience and honors. Key personnel include the principal investigator and any other individual who participate in the scientific development or execution of the project. Key personnel typically will include all individuals with doctoral or other professional degrees but in some projects will include individuals at the masters or baccalaureate level provided they contribute in a substantive way to the scientific development or execution of the project. Include present membership on any Federal Government public advisory committee. List, in chronological order, the titles, all authors, and complete references to all publications during the past three years and to representative earlier publications pertinent to this application. DO NOT EXCEED TWO PAGES.

Research/Professional Experience

1983-84	Professional Officer, School of Chemistry, UNSW, NSW, Australia
1984 - Dec 1984	Research Assistant, Ludwig Institute for Cancer Research, NSW, Australia
1985-1986	Research Fellow, Ludwig Institute for Cancer Research, NSW, Australia
May 1986 - 1991	Staff Scientist II, Lawrence Berkeley Laboratory
Feb 1991-	Adjunct Assistant Professor, Department of Pharmaceutical Chemistry, School of Phar v. University of California, San Francisco
Oct 1991 - 1994	Staff Scientist III, Lawrence Berkeley Laboratory
Aug 1992 -	Co-Principal Investigator, National Tritium Labelling Facility, LBL
May 1994 -	Staff Scientist, Lawrence Berkeley Laboratory

Awards and Honors

1978	Chamber of Manufactures of NSW Prize for Best Performance in Nucl. & Radiation Chem.
1979	First Class Honors and University Medal in Chemistry, UNSW
1979	C.S.R. Chemicals Prize for Best Performance in Chemistry Honors, UNSW
1980-83	Commonwealth Postgraduate Award

iii. Identification Team Members

Core Team

BIOGRAPHICAL SKETCH

CHESTER CHANG	DOE/OAK Berkeley Site Offi

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
Golden Gate University, San Francisco CA	MBA	1994	Business Administration
Santa Clara University, Santa Clara CA	MS	1981	Electrical Engineering
Long Island University, Greenvale NY	MS	1974	Marine Science
City Univ of New York, New York NY	BE	1971	Electrical Engineering

PROFESSIONAL SOCIETIES:

PROFESSIONAL EXPERIENCE:

1 1/2 Year with DOE/OAK/BSO
- Facilities Management
- LCAM Order (430.1) Implementation Team
- Contract Performance Measures Team

Previously:
- 20 years with U.S. Department of Navy - Design & development of electronic systems & facilities.
- 3 years with private industry (Grumman; Sperry Rand) - Design & development of electronic systems.

Jeffrey Chung

Education:	BA in Human Factors/Ergonomics MS in Safety Sciences PhD in Educational Administration
Certification (s):	Certified Safety and Security Director Certificate in Hazardous Waste Site & Hazardous Materials Incident Response EPA Asbestos Abatement
Current Position:	Deputy Director, EH&S Division at LBNL; Field Support Department Head, 2 years at LBNL
Previous ES&H Experience:	Director for Environment, Health & Safey for 5 years at UC Riverside overseeing a staff of 21 EH&S professionals. Assistant Director for EH&S for 2 years at UC Santa Barbara. Senior EH&S Technologist for 1 year UCSB. Professor in Safety Management for 2.5 years.

JAMES CHWANG -- Laboratory Safety Team

DOE/OAK Environment, Safety and Health Division

B.S. Civil Engineering

Registered Professional Engineer, State of Florida

Fire Protection Engineer, DOE Oakland Operation Office, six years. Evaluate adequacy of fire protection programs and facility designs.
OAK Representative to DOE Explosive Safety Committee.
OAK Representative to DOE Pressure Safety Committee.
OAK Representative to DOE Fire Safety Committee.
Lead of the 1995 and 1996 Annual ES&H Appraisals of LBNL

Previously:
Supervisory fire protection engineer for U.S. Navy, eleven years.
Fire Protection Engineer, Dade County (Miami) Florida, four years.

DEAN W. DECKER

B.S., Biological Science, University of Cincinnati, 1977
M.S., Industrial Hygiene, University of Cincinnati, 1981

Certified Industrial Hygienist (CIH #3104), 1985

U.S. Department of Energy, Oakland Operations Office (1984 to present).
Environment, Safety and Health Division. Principle responsibilities are:

- Industrial Hygiene and Occupational Health Program assessment
- Industrial Hygiene technical assistance and guidance
- Ergonomic program development
- Safety and Health contract development

Professional committee membership includes:

- Health and Safety Subteam Leader for LBNL, LLNL, and LANL contract negotiations
- Chair, OAK Ergonomic Committee
- DOE Human Subject Review Program
- DOE Hazardous Waste Worker Safety and Health Working Group
- OAK Industrial Hygiene Quality Improvement Team
- LBNL NTLF Necessary and Sufficient ES&H Standards Pilot Project
- Contract Performance Measures Peer Reviews of LBNL, LLNL, and LANL

U.S. Navy, fourteen years experience at Naval Medical Center Oakland and Mare Island Naval Shipyard including:

- Medical Surveillance program development
- OSH program oversight inspections
- Asbestos removal
- Employee complaint investigations
- Shop / union safety & health committees

TANYA GOLDMAN -- Environmental Protection Team

DOE/OAK Environmental Management Division

MS Civil Engineering
BA Mechanical Engineering

Waste Minimization/Waste Management Engineer, DOE Berkeley Site Office, four years.
OAK Representative to the DOE Pollution Prevention Team
OAK Representative to the DOE Waste Minimization Working Group

Previously:
Waste Management/Waste Minimization Engineer for U.S. Navy, three years.
Facility Engineer, U.S. Navy, three years
Power Systems Engineer, Bechtel Power, eight years

BIOGRAPHICAL SKETCH

Alan Jackson

Education:

1959-65	Worsley Technical College, Lancashire, England.
1965-68	University of Lancaster - B.A. II(i) Physics
1968-84	Continued education in the British Scientific Civil Service

Professional Affiliations: Member, American Physical Society
Member, American Association for the Advancement of Science

Current Position: Senior Scientist/Physicist, ALS Accelerator Group Leader.

Member of the Scientific Advisory Committee to the University of Chicago, on Accelerator Issues at the Advanced Photon Source.

Member of the Machine Advisory Committee of Sincrotrone Trieste, Italy.

Member of the USPAS Program Advisory Committee.

Experience: 1968-73 Scientific Officer, Daresbury Nuclear Physics Laboratory (DNPL). Design of beamlines for high energy physics experiments. Design of special beamline and diagnostics for a low flux electron beamline, including environmental shielding. Design of a novel polarized photon beamline for rho- and pi-meson photo production experiments in the 2-4 GeV energy region.

1973-78 Higher Scientific Officer, DNPL. Lattice and transport line design of the Synchrotron Radiation Source (SRS).

1978-84 Construction, commissioning, and operation of the SRS as a national user facility.

1984-96 Staff Scientist, LBNL. Accelerator design. ALS design, commissioning and operation.

Bruce King

Education:	BS in Biological Science BS in Occupational Health, Industrial Hygiene MS in Safety and Hygiene Engineering
Certification (s):	Certified Industrial Hygienist Asbestos Contractor and Supervisor AHERA Certification Hazardous Waste Operations & Emergency Response Certification
Current Position:	Industrial Hygiene Team Leader, 5 years at LBNL
Previous ES&H Experience:	Health & Safety Officer, Project Manager, Quality Assurance Manager, and Consultant for one year at Engineering Science. California-Site Safety & Health Engineer/Manager at Intel Corporation for 9 years.

JOANNE D. LORENCE -- Accelerator Activity Team

DOE/OAK Berkeley Site Office

BS Mechanical Engineering

Acquiring certification in the DOE Technical Qualification Program

Facility Operations Engineer at BSO, 5 years: Functional expert in occurrence reporting, emergency management, quality assurance, ES&H management planning.
DOE Lead for review of LBNL ES&H Management Plan
BSO Representative at ES&H Field Support monthly meetings
BSO Representative at LBNL monthly Safety Engineers meetings
BSO Representative at OAK, LBNL, LLNL, SLAC quarterly Emergency Management Team meetings
DOE Qualified Facilitator; Facilitator for OAK Process Improvement Teams

Previously:
Hughes Aircraft, two years, mechanical engineeer, electronic materials
U.S. Navy, Mare Island Shipyard, one year, on-shift test engineer

NAME	POSITION TITLE
Ron Pauer	Leader, Environmental Protection Group Lawrence Berkeley National Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of California, Berkeley	MPH	1975	Industrial Hygiene
University of California, Davis	BS	1973	Biological Sciences

PROFESSIONAL CREDENTIALS:

Certified Industrial Hygienist, American Board of Industrial Hygiene, No. 4993

PROFESSIONAL EXPERIENCE:

1975 - Present Lawrence Berkeley National Laboratory
Manage a wide variety of environmental compliance and monitoring programs for the Laboratory.

RESUMÉ

NAME: **BERT H. SCHLEIFER**
Deputy Facilities Manager
Facilities Department
Lawrence Berkeley National Laboratory

TELEPHONE: (510) 486-5261

EDUCATION: MS Electrical Engineering, University of Santa Clara, 1973
BS Electrical Engineering, Federal Engineering College Graz, Austria, 1957
Undergraduate and Graduate Coursework in Business Administration, Ohio University, 1974-77

REGISTRATION: Registered Professional Engineer (Electrical) in California, Alaska and Nevada

AFFILIATIONS: Member, Institute of Electrical and Electronics Engineers (IEEE)
Member, Power Engineering Society (IEEE)
Member, Industrial Applications Society (IEEE)

EXPERIENCE: **1988-Present, Lawrence Berkeley National Laboratory, Facilities Department, Deputy Facilities Manager.** Responsible for project management of new construction projects and facilities alteration projects. Oversight of staff including project managers and multi-disciplinary design group including architectural, civil, electrical, mechanical and energy disciplines. Primary responsibilities include project management, engineering and design, staffing of sections, training and quality assurance, value engineering and long range planning.

1983-1988, Lawrence Berkeley National Laboratory, Facilities Department, Electrical Section Leader. Responsible for managing electrical engineering activities including design, long range planning, capital budgeting and project management of new construction and facilities rehabilitation.

1977-1983, Bechtel Corp., Supervising Engineer, Assistant Chief Electrical Engineer. Responsible for the design of electrical power systems for rapid transit projects, nuclear waste and reprocessing facilities, and oil production and refinery facilities. Activities included staffing of projects, quality assurance, value engineering and consulting with client personnel.

1973-1977, Babcock and Wilcox Corp., Engineering Manager. Headed section responsible for contract administration of nuclear reactor control rod drive systems. Directed customer relations, proposal development and contract execution. Performed workload assessment and salary administration for engineers and clerical personnel.

1967-1973, Bechtel Corp., Senior Engineer. Designed electrical power systems for rapid transit facilities and nuclear power plant facilities. Prepared single line diagrams, schematic diagrams, performed short circuit and voltage drop studies, developed contract specifications and purchase order requisitions.

1962-1967, Heberlein Corp., Application Engineer. Designed process control systems for chemical plants, performed control system stability analysis advised clients on equipment applications, prepared proposals and administered purchase orders.

BIOGRAPHICAL SKETCH

NAME	POSITION TITLE
Mike Schoonover	Health Physicist- Planning and Hazard Analysis Radiation Protection Program Environmental Health & Safety Division Lawrence Berkeley Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of California, Berkeley	MS	1969	Health Physics/Bioradiology
University of Washington, Seattle	BS (cum laude)	1967	Chemistry (Nuclear)

Additional Studies: 1969-70 University of Calif, Berkeley: research toward Ph.D., Biophysics

PROFESSIONAL EXPERIENCE:

1991-1995: Group leader/Unit Leader LBL-EH&S Radiation Assessment Field Operations. Deputy Radiation Control Manager, LBL. Managed and developed programs in radioactive materials control, accelerator health physics, x-ray machine safety. Current projects: strategic planning and development fc Radiation Protection Program and radiation hazard analysis of accelerators and radioactive materials uses

1974-1991: Health physicist, University of California EH&S Radiation Safety. Last position: Radiatior Safety Officer. Performed, and later managed all aspects of radiation safety program (materials labs, radiation-producing machines, lasers). Reactor Health Physicist for 1 MW TRIGA reactor. Prepared, negotiated, and implemented UCB's Radioactive Material License with Calif Dept of Health Services.

Earlier work: Health Physics Trainee, Atomic Energy Commission, Richland Operation Office; Student Health Physics Research Assistant, LBL and ORNL, Chemist, San Francisco Police Dept Evidence Laboratory.

Other: Have consulted for industrial and academic research radiation users and hospitals re radioactive material licensing, program development, and regulatory compliance issues. Chaired a committee for the Health Physics Society that worked with Calif Dept of Health Services-Rad Health to improve their licensing and compliance procedures.

Awards, Honors: Atomic Energy Commission Fellowship for Health Physics, National Merit Scholarship, Outstanding Performance Award at UCB. Member of Board of Directors, Northern California Chapter, Health Physics Society

CARL SCHWAB -- Environmental Protection Team

DOE/OAK Environment, Safety and Health Division

BS Mechanical Engineering

Professional Engineer, California

Environmental Engineer, four years with DOE. Responsibilities include air quality, groundwater, waste water, environmental monitoring and reporting, storage tanks, NEPA, environmental permits and other negotiations with regulatory agencies.
BSO Representative to City of Berkeley / LBNL monthly environmental meetings
BSO Representative to DOE NEPA Process Improvement Team
BSO Representative on OAK Internal Survey and Improvement Working Group
Participant on LBNL ES&H Self-Assessment Root Cause Analysis Working Group

Previously, twenty years of general environmental experience with other Federal agencies.

BIOGRAPHICAL SKETCH

NAME	POSITION TITLE
John Michael Peter Sims	Program leader for development of site-wide Work Smart Standards for LLNL

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of Chicago	Postdoctoral Fellow	1977	Biochemistry
University of Kansas	Ph.D.	1974	Physiology & Cell Biology
University of Kansas	AEC-NSF Fellow	1970	Radiation Physics
St. John's University	M.S.	1968	Biology
St. John's University	B.S.	1966	Biology

PROFESSIONAL CREDENTIALS:

1970 Atomic Energy Commission-National Science Foundation Fellowship, Training in Radiation Physics, University of Kansas, Lawrence, KS.

1983 Syntex Service Award for outstanding work as Radiation Safety Officer.

PROFESSIONAL EXPERIENCE:

Biochemist: Eighteen years of basic research on muscle chemistry, chemical and virus-induced immune system abnormalities, and cancer.

Environmental & Safety Assessor: Six years with responsibility for the safe use and disposal of radiochemicals. Fifteen years performing assessments on radiological, toxic chemical, and biohazardous operations.

Manager: Sixteen years of project and supervisory management of research, safety, and environmental organizations.

Teacher: Six years college teaching, including two years Assistant Professor of Biology.

1988-Present Section & Deputy Division Leader, LLNL, Livermore, CA

1987–1988 Senior Scientist, SAIC, Pleasanton, CA

1981–1985 Staff Researcher II, Institute of Bio-Organic Chemistry, Syntex Research, Palo Alto, CA

1977–1980 Staff Researcher I, Institute of Biological Sciences, Syntex Research, Palo Alto, CA

1974–1977 Research Associate, University of Chicago, Drs. Murray Rabinowitz and Radovan Zak, collaborators.

1973–1974 Research Assistant, University of Kansas, Dr. Peter H. Cooke, principal investigator.

1972–1974 Ph.D. Thesis research, University of Kansas, Dr. Eugene C. Bovee, thesis adviser.

1970–1971 Research Assistant, University of Kansas, Dr. Eugene C. Bovee, principal investigator.

1967–1969 Master's degree research, St. John's University.

Lawrence Livermore National Laboratory
Livermore, California

James S. Johnson

Deputy Associate Program Leader
Fission Energy and Systems Safety Program

Education

PhD in Inorganic and Organic Chemistry, Duquesne University, Pittsburgh, PA, 1972
MSH in Air Pollution and Industrial Hygiene, University of Pittsburgh, Pittsburgh, PA, 1972
BA in Chemistry, Indiana University of Pennsylvania, Indiana, PA, 1967

Research Interests

- Technologies to improve the comprehensive practice of industrial hygiene.
- Fire research needs for facility and personal protection.
- Novel systems to monitor employee exposure to volatile chemicals, solids, and aerosols.
- All areas of respirator and other types of personal protective equipment research.

Experience

James Johnson is Division Leader of the Special Projects Division, a multidiscipline team of scientists and technicians. This team identifies and solves health, safety, environmental, and related technical problems and helps implement the technologies associated with these solutions. Division research includes projects in Fire Safety, Aerosol Science, Industrial Hygiene and Safety, Radiation Safety, Explosive Safety, and Environmental Protection. Johnson's responsibilities are to identify and develop the Division's new projects and long-range plans; maintain the appropriate funding, staff, and facilities; and evaluate input for program reviews and technical presentations. He also prepares and presents proposals to government agencies and private-sector sponsors, and he helps organize and direct research projects to provide solutions to health, safety, and environmental problems at LLNL, within the Department of Energy, other government agencies, and the private sector. He prepares reports and publications in his areas of technical expertise, and he participates actively on national and international professional societies, technical committees, and consensus standards organizations.

Awards and Special Recognition

- Consultant to the International Atomic Energy Agency, to select equipment to protect personnel from radioactive and chemical agents (March–June 1989 and July 1993).
- Outstanding Service Award, American Society for Testing and Materials, F-23 Committee on Protective Clothing (June 1990).
- Devoted Service and Significant Contribution Award, American Industrial Hygiene Association Protective Clothing and Equipment Committee (May 1991).

Memberships and Committees

- American Chemical Society, Division of Chemical Health and Safety.
- Air and Waste Management Association.
- American Industrial Hygiene Association: Personal Protective Devices Committee.
- American Academy of Industrial Hygiene: Certified in Comprehensive Practice #1165.
- International Society for Respiratory Protection: Board of Directors.
- American Society for Testing and Materials: F-23 Committee on Protective Clothing.
- American National Standards Institute: Z-88 Secretariat, Vice Chairman.
- National Fire Protection Association: Committee for Firefighter Protective Clothing and Equipment.

BIOGRAPHICAL SKETCH

NAME	POSITION TITLE
V. David Tudor	Hazard Assessment Program Manager Environmental Health & Safety Division Lawrence Berkeley Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of California Extension, Davis		1992	Hazardous Materials Mgt. Certification
University of Washington, Seattle	M. Arch.	1976	Architecture
University of Colorado, Boulder	B.A.	1961	Social Science

PROFESSIONAL CREDENTIALS:

Registered Architect, State of California, Certificate No. 10213, 1979

PROFESSIONAL EXPERIENCE:

1976 - 1989 Professional design of facilities containing hazardous materials in private industry.
Projects include the following major facilities:

Semiconductor Manufacturing Plant, IBM, San Jose, California
Chemical Storage Facility, IBM, San Jose, California
Research Laboratory, IBM, San Jose, California
Printing Plant, Reno, Nevada
Thin Film Wafer Laboratory, Memorex Corp., Santa Clara
Toxicology Laboratory, San Francisco General Hospital, San Francisco
Environmental Test Facility, Sandia National Laboratory, Livermore

1989 - 1992 Lawrence Berkeley Laboratory, Management of Design and Construction of Research Facilities.
Projects include:

Research Laboratory Addition, Building 74
Gallium Arsenide Laboratory Modifications, Building 2
Metal Organic Chemical Vapor Deposition (M.O.C.V.D.) Laboratory, Building 2
Instrumentation Support Laboratory, Building 70A

1992 - present Lawrence Berkeley Laboratory, Hazard Assessment Program Manager

Accelerators and Fixed Radiation Sources Team

BIOGRAPHICAL SKETCH

ALAN JACKSON

SEE CORE TEAM BIOS

Rob Connelly

Education:	BS in Environmental and Occupational Health Science
Certification (s):	Certified Industrial Hygienist EPA Asbestos Abatement Contractor/Inspector
Current Position:	EH&S Professional (Industrial Hygiene), 5 years at LBNL
Previous ES&H Experience:	Industrial Hygienist for 2 years at UC Irvine.

Roger Kloepping

Education:	MS Radiological Health Physics MS Chemistry BS Chemistry
Certification (s):	Certified Health Physicist Advanced Laser Safety Officer Radioactive Materials Radioactive Detection and Measurement
Current Position:	Health Physicist, EH&S Professional (Radiation Protection), 5 years at LBNL
Previous ES&H Experience:	Radiation Safety Officer for 15 years at San Jose State University. Health Physicist for LLNL for 12 years. Roger has been very active in the Health Physics Professional Society.

BIOGRAPHICAL SKETCH

JOANNE LORENCE

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RESUME

EDWIN I. NJOKU

U.S. Department of Energy
Oakland Operations Office
1301 Clay Street
Oakland, California 94612-5208
Phone: (510) 637-1606 Fax: (510) 637-2078

EXPERIENCE:

Apr 95 - Present Health Physicist/Occup & Environ Safety Specialist,
U.S. Department of Energy, Oakland Operations Office
Provide technical expertise and consultation to DOE Oak Office on EH&S programs. Provide program direction and guidance in EH&S areas to DOE/OAK contractors, including expertise on safety laws, regs and requirements pertaining to radiation issues. Review contractor project proposals, design specifications, and safety analysis reports to assure compliance with DOE safety standards.

Jan 93 - Apr 95 EH&S Group Leader, Brookhaven National Laboratory
Supervise the activities of the EH&S group attached to the Accelerator Systems and Development Depts (Alternating Gradient Synchrotron, Relativistic Heavy Ion Collider, and LINAC facilities). Group provides health physics, industrial hygiene, industrial safety, and environ coverage at the assigned facilities.

Apr 84 - Jan 93 Senior Health Physicist, CA Dept of Health Services
Supervise and direct the activities of the Radioactive Materials Licensing staff; consult with technical and scientific staff of Universities, State and Federal Agencies, Provide technical assistance on radiation issues to various Govt agencies, institutions, and industry. Prepare technical reports and regulations.

Sept 82 - Mar 84 Consulting Project Health Physicist, Applied Health Physics, Inc.
Headed major decontamination projects.

Mar 80 - Sept 82 University HP/RSO, University of Pittsburgh
Responsible for day-to-day operations of the Broadscope A licensed program at the University and affiliated medical centers.

Sept 78 - Feb 80 President, RadTek Engineering Company

May 77 - Sept 78 Health Physicist, Yankee Atomic Electric Company

EDUCATION:

1995 MS in Environ Health and Ind Hygiene (NYIT/Hunter College)\
1993 Diploma, Command & General Staff College (Ft. Leavenworth)
1977 MS in Health Physics (UMASS - Lowell)
1975 BS in Applied Biology (UMASS - Lowell)

CERTIFICATION

ABHP (Comprehensive)
Asbestos Sampling Specialist (State of New York)
Emergency Responder (State of New York)

BIOGRAPHICAL SKETCH

RON PAUER

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NAME	POSITION TITLE
Carol Kielusiak	NEPA/CEQA Program Manager Lawrence Berkeley National Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
California State University, Sacramento	MA	1982	Anthropology
San Diego State University	BA	1974	Anthropology

PROFESSIONAL CREDENTIALS:

None

PROFESSIONAL EXPERIENCE:

1992 - Present Lawrence Berkeley National Laboratory
Managed preparation of Environmental Impact Statements and Reports, Environment: Assessments, Initial Studies and Mitigation Monitoring Plans with respect to the NEPA/CEQA.

1985 - 1993 TENERA, L.P., Senior Environmental Analyst
Broad array of efforts related to regulatory compliance, particularly as related to hazardous wastes and hazardous materials.

Name____Peter Persoff_____

Education:	BS in Chemical Engineering MS in Civil Engineering (Environmental) PhDin Civil Engineering (Environmental)
Certification (s):	Registered Civil Engineer (Calif. C-29590)
Current Position:	Staff Scientist, 16 years at LBNL
Previous ES&H Experience:	Division Safety Coordinator, 1992-1995

NAME	POSITION TITLE
Stan Terusaki	Environmental Analyst Lawrence Livermore National Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of California, Los Angeles	BS	1981	Geological Sciences

PROFESSIONAL CREDENTIALS:

None.

PROFESSIONAL EXPERIENCE:

1991 - Present — Lawrence Livermore National Laboratory, Environmental Analyst
Develop and implement environmental protection compliance programs for the management of hazardous, low level and mixed low level wastes and for the use of polychlorinated biphenyls. In addition, lead the environmental subteam for the LLNI Necessary and Sufficient Pilot Project for radioactive wastes.

1990 -1991 — United States Pipe and Foundry Company, Environmental Engineer
Managed all environmental compliance activities of the facility.

1987 -1990 — Waste Management of North America
Performed field technician duties and provided technical support for permit and complaince activities.

NAME	POSITION TITLE
Tim Wan	Waste Management Compliance Specialist Lawrence Berkeley National Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of California, Hastings College of the Law	JD	1986	Law
University of California, Berkeley	BA	1976	Biophysics

PROFESSIONAL CREDENTIALS:

- Certified Hazardous Materials Manager, Academy of Certified Hazardous Materials Management, No 5053.
- Registered Environmental Assessor, California, No 05718
- State Bar of California, No 139747

PROFESSIONAL EXPERIENCE:

1992 - Present Lawrence Berkeley National Laboratory, EH&S Professional
Analyze legislation and regulations on hazardous waste.

1988 - 1992 University of California, Santa Cruz, Hazardous Waste Management Program Manag
Designed and implemented a comprehensive hazardous waste disposal program.

1987 - 1988 Training Institute, Fort Ord, Hazardous Waste Handling Course Director
Taught classes on hazardous waste laws and regulations.

BIOGRAPHICAL SKETCH

BERT SCHLEIFER

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BIOGRAPHICAL SKETCH

BERT SCHLEIFER

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John Bowerman

Education:
BS, Mechanical Engineering, Cal Poly, San Luis Obispo, CA

Current Position:
Facilities/Operations Researcher, employed at LBNL September , 1988 to present

Experience: 1965 to present. Trained in:

- Asbestos abatement
- Mechanical equipment
- Boiler and steam turbines
- Generators (large)
- APME section and welding
- Structural welding
- Construction equipment
- Rigging/Cranes
- Shoring/Trenching/Excavation
- High voltage equipment

BIOGRAPHICAL SKETCH

CHESTER CHANG

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Paul Davis

Education:	BS in Chemistry BS in Physical Science MS in Safety Sciences
Certification (s):	Certified Industrial Hygienist EPA Asbestos Control Certificate in Hazardous Waste Site & Hazardous Materials Incident Response
Current Position:	Industrial Hygienist, 5 years at LBNL
Previous ES&H Experience:	Industrial Hygienist/Industrial Technician for 10 years at Chevron Chemical - Air monitoring, soil excavation, training, asbestos, respiratory protection, hazard communication

BIOGRAPHICAL SKETCH

NAME	POSITION TITLE
Steven M. McConnell	Technical Lead, Industrial Safety Lawrence Livermore National Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
CSU, Sacramento	BA	1978	Business Administration

PROFESSIONAL CREDENTIALS:

Certified Safety Professional (May 1988)
Registered Environmental Assessor (1990)

PROFESSIONAL EXPERIENCE:

1992 - 1996 LLNL, Industrial Safety Engineer, Technical Leader
Perform accident investigations, ergonomic evaluations, training and education courses, building assessments, construction safety, provide consultation services to various programs.

1989 - 1992 Coca-Cola Enterprises, Division Manager, Environmental Safety & Health
Responsible to develop, implement and maintain an ES&H program for the Western Division of CCE including more than 100 facilities and 5,000 employees. Provided oversight for the removal of more than 100 underground storage tanks.

1985 - 1989 U. S. Windpower, Inc., Manager, Safety & Security
Developed and implemented a comprehensive ES&H program for a company of more than 500 employees. Facilities located on both coasts.

1980 - 1985 Henry J. Kaiser Co., Safety Manager
Responsible to develop and implement health and safety programs on several large scale construction projects.

Karl R. Olson

Earth Sciences (ms-50E)
Lawrence Berkeley Laboratory
Berkeley, CA 94720
(510) 486-6129

Experience

University of California - Lawrence Berkeley Laboratory

MANAGER, Earth Sciences Division, 1979-94
Management of LBL's geoscience and geological engineering research unit. Responsibilities include divisional planning, program and facility development, project initiatives and all aspects of business, financial and personnel administration. Experienced in safety and quality assurance oversight, government and public interactions, inter-Laboratory and University collaborations, environmental compliance, external affairs and technology transfer activities.

PROJECT ENGINEER, Engineering Division, 1976-79
Planning, funding and execution of R&D projects for the Department of Energy. Projects included alternative energy systems, unique equipment fabrications, instrumentation development and scientific field experiments.

United States Government

CONTRACT TECHNICAL MANAGER, Atomic Energy Commission, 1972-76
Technical and administrative management of contracted R&D work in advanced energy systems, fusion research, nuclear reactor design, nuclear materials security, and related environmental, public health and safety topics.

ENGINEERING WATCH OFFICER, Navy, 1967-71
Naval nuclear reactor and power plant operation, maintenance and overhaul.

Commonwealth Edison Company

ENGINEERING INTERN, 1966-67
Power plant design and system studies for the Chicago utility.

Education

University of California, Berkeley, M.S., 1972
Major: Nuclear Engineering
Minor: Business Administration

University of Illinois, B.S., Physics, 1967

Pat Thorson

Education:	BS in Meteorology MS in Biometeorology
Current Position:	Environmental Engineer, EH&S Professional (Environmental Protection), 5 years at LBNL
Previous ES&H Experience:	Air Quality Meteorologist for 3 years at BAAQMD. Environmental Consultant for 2 years at Woodward-Clyde. Environmental Health Specialist for 3 years at Missoula City/County Health Department. Air Quality, risk assessment, data analysis.

Laboratory Safety Team

Paul Blodgett

Education:	BS in Environmental Toxicology
Certification (s):	Certified Industrial Hygienist Asbestos Contractor, Inspector and Supervisor AHERA Certification Hazardous Waste Operations & Emergency Response Certification
Current Position:	Industrial Hygienist, 5 years at LBNL
Previous ES&H Experience:	Industrial Hygiene Consultant, Normandeau, 4 years

BIOGRAPHICAL SKETCH

DEAN DECKER

SEE CORE TEAM BIOS

BIOGRAPHICAL SKETCH

NAME	POSITION TITLE
Christine Donahue	Health Physicist- RWA Program Manager Radiation Protection Program Environmental Health & Safety Division Lawrence Berkeley Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of California, Berkeley	BS	1981	Biophysics
University of Virginia, Charlottesville	MS	1983	Nuclear Engineering
California State University, San Jose	MS	1987	Radiological Health Physics

PROFESSIONAL EXPERIENCE:

1994-1996: *Health Physicist*, LBNL-EH&S Radiation Protection Program. Developed and manage the Radiological Work Authorization (RWA) program. Responsible for regulating the use of unsealed radioactive material in LBNL research facilities, excluding the 88" cyclotron and the ALS. Oversee the routine surveys of the laboratories and perform annual audits and retraining of radioactive material users. Conduct the Radiation Safety Training Fundamental and Lab Safety training classes (EH&S 400/432).

1987-1991: *Senior Health Physicist*, Stanford University Health Physics Department. Manager of the medical machine program at both Stanford Hospital and the Palo Alto VA Hospital. Performed environmental surveys, beam quality assurance and patient and staff ALARA studies of the x-ray machines, fluoroscopes, therapy units and CT scanners. Developed and taught the Radiation Physics class for the Radiology residents at Stanford and the radiation safety training of nurses, x-ray technicians and users of unsealed radioactive material. Functioned at the Radiation Safety Officer (RSO) for the Palo Alto VA Hospital.

1986-1987: *Health Physicist*, Pacific Gas and Electric Co., San Francisco. Health Physics support of the Diablo Canyon Power Plant Radiation Protection Group. Responsibilities included special dosimetry studies, implementation of the Personnel Radiation Management (PRM) computer system and in-plant engineering audits. Functioned as the dosimetry engineer responsible for maintaining ALARA during the steam generator high-dose work.

1982-1986: *Nuclear Engineer* - Bechtel National, San Francisco. Performed radiation shielding analyses and offsite dose assessments for the Defense Waste Processing Facility. Additional duties included evaluating available treatment solidification methods for liquid radwaste and volume reduction processes for solid radwaste generated in nuclear facilities. Developed a computer program (PAKRAD) to handle the tracking, management, classification, and decay analyses of radioactive waste.

RICHARD HADDOCK

BA, Psychology
Graduate work toward an MA in Safety Management

Graduate of US Army Safety Intern Program
Certified Accident Investigator
HAZWOPER Certified

Current Position (1985 to present): Occupational Health and Safety Manager, DOE-OAK ESH Division (Industrial, Firearms, Construction, FEOSH Program, Employee Concerns Manager)
Member: DOE Hoisting and Rigging Safety Committee
DOE Construction Safety Committee
DOE Firearms Safety Committee

US Dept of Agriculture, 1980-1985, Safety Manager

US Army, 1972-1980, Safety Manager

Richard J. Kelly, MS, CIH

Lawrence Livermore National Laboratory
Hazards Control Department

EDUCATION:

University of Cincinnati, Institute of Environmental Health and Kettering Laboratory, MS in Environmental Hygiene and Safety, Summa Cum Laude, 1983

University of Pittsburgh, BS in Psychobiology, Minor in Chemistry, Magna Cum Laude, 1979

PROFESSIONAL EXPERIENCE

Lawrence Livermore National Laboratory, University of California, 1988-Present
- Industrial Hygienist
- Environmental Safety and Health Team Leader
- Technical Writer

University Of California At Berkeley, 1984-1988
- Supervisor, Industrial Hygiene and Safety
- Founder, Pacific Asbestos Information Center, University Extension Program (EPA Grant)
- Industrial Hygienist

Mare Island Naval Shipyard, Vallejo, CA, 1983-1984
- Industrial Hygienist

Marathon Oil Company, Findley, OH, 1983
- Industrial Hygiene Intern

General Electric, Jet Engine Facility, Evendale, OH, 1982
- Industrial Hygiene

CERTIFICATIONS:

Certified Industrial Hygienist, # 3597, Am. Bd. Ind. Hyg., 1987

Accredited Asbestos Inspector, Management Planner, Response Planner and Asbestos Abatement Supervisor, 1987

Microscopic Identification of Asbestos, McCrone Institute, 1985

BIOGRAPHICAL SKETCH

NANCY E. ROTHERMICH

Education:

1981, MS, Radiation Health Physics, San Diego State University
1979, BS, Biology, San Diego State University

Professional Affiliations:

- American Nuclear Society, Fuel Cycle and Waste Management Division Program Committee Chair
- American Society of Mechanical Engineers, Mixed Waste Committee
- Program Subcommittee Chair, American Society of Mechanical Engineers, Mixed Waste Committee

Current Position:

Provide Project Management and Technical Support to DOE Headquarters Hazardous and Sanitary and Industrial Waste Program.

Experience:

1993-Present	Provide Project Management and Technical Support to DOE Headquarters Hazardous and Sanitary and Industrial Waste Program
1991-1993	Program Manager for the Waste Operations Program at the hazardous Waste Remedial Actions Program (HAZWRAP).
1989-1991	Project Manager at Martin Marietta Energy Systems for HAZWRAP.
1968-1989	Senior Engineer for Automated Sciences Group, Inc. assigned to HAZWRAP.
1987	Senior Engineer for Automated Sciences Group, Inc. assigned to HAZWRAP.
1982-1986	Waste Management Specialist for the Radioactive Waste Management Project, Environmental Sciences Department, Reynolds Electrical & Engineering Co., Nevada Test Site.

Jack Salazar

Education:	BS in Environmental Sciences, Physical Science Option
Certification (s):	Certified Industrial Hygienist Certificate in Hazardous Waste Site & Hazardous Materials Incident Response EPA Asbestos Abatement/Inspector/Analyst Certificate in Hazardous Materials Management
Current Position:	Field Support Department Group Leader, Bio-Energy Sciences Group Leader, 2 years at LBNL
Previous ES&H Experience:	Manager, Laboratory Health and Safety for 8 years at UC Berkeley - Industrial Hygiene, emergency response. EH&S Training Specialist for 3 years at ESR. Environmental Inspector for 2 years at Homesafe Assessment.
Other N&S Teams:	IFA Team Leader

CURRICULUM VITAE

PERSONAL:
Name: **Richard I. Schwarz**

Birth date: 4/15/47

Citizenship: USA

ADDRESS:
Residence: 6584 Chabot Road
Oakland, CA 94618
510-547-6594

Business: Lawrence Berkeley Laboratory
Family: married; three children
Berkeley, CA 94720
FAX: 510-486-5586
e-mail: rischwarz@lbl.gov

EDUCATION:

Harvard University, Ph.D., 1975; Biochemistry and Molecular Biology

University of California, Berkeley, A.B., 1968; Biophysical Chemistry

EXPERIENCE:

Staff Scientist (1984 -) Life Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA 94720

Associate Staff Scientist (1981-1983) The Jackson Laboratory, Bar Harbor, ME 04609

Visiting Scientist (1980) Imperial Cancer Research Fund, London, England

Post-doctoral fellow (1975-1979) Laboratory of Chemical Biodynamics, University of California, Berkeley, CA 94720

ACADEMIC HONORS AND FELLOWSHIPS:

A.B. degree with distinction and honors in chemistry
Phi Beta Kappa
NIH Postdoctoral Fellow (NCI)
Outstanding Performance Award (LBNL)

Michele Sundsmo

Education:
BS in Biochemistry / Biophysics
MS in Radiological Health
Certificate in Hazardous Materials Management (UCB)

Current Position:
Health Physicist for last 1.5 years at LLNL, serving as 10 CFR 835 Implementation Coordinator and conducting internal audits for 10 CFR 835

Previous ES&H Experience:
Health Physicist for 8 years at Pacific Gas & Electric supporting power plant health physics, conducting internal assessments, providing oversight for the Radiological Environmental Monitoring Lab and regulatory reports, and supporting emergency planning functions.

iv. Confirmation Team Members

CURRICULUM VITAE

Martin Blume
Deputy Director, Brookhaven National Laboratory

Education:

New York Public Schools
A.B. Princeton 1954
A.M. Harvard 1956
Ph.D. Harvard 1959 (Physics)

Appointments:

Tokyo University, Fulbright Fellow, 1959-1960
AERE, Harwell, England; Research Associate, 1960-1962
Brookhaven National Laboratory
- Associate Physicist, 1962-1965
- Physicist, 1965-1970; Permanent Tenure 1966
- Senior Physicist, 1970-
- Group Leader, Solid State Theory, 1968-1975
- Deputy Chairman, Physics Dept.; Head, Solid State Physics 1975-1978
- Synchrotron Radiation Scientific Program Head, 1979-1981
- Associate Director for Low Energy Physics and Chemistry, 1981-1984
- Chairman, National Synchrotron Light Source Department, 1983-1985
- Deputy Director, 1984-

State University of New York at Stony Brook, Professor of Physics, 1972-1980

Organizations:

Fellow, American Academy of Arts and Sciences
Fellow, American Association for the Advancement of Science
Fellow, American Physical Society
Fellow, New York Academy of Sciences

Review and Visiting Committees:

University of Georgia, Physics Department, 1974
Polytechnic Institute of New York, Physics Department, 1974, 1979
Stanford Synchrotron Radiation Laboratory Program Review Panel 1980-1983
Princeton Plasma Physics Laboratory, 1981-1985
Massachusetts Institute of Technology National Magnet Laboratory, 1983-1986
New York State Science and Technology Foundation, 1983
New York University, Physics Department, 1986
Harvard University, Division of Applied Science, 1986-1990
Chalk River Nuclear Laboratories, Condensed Matter Physics, 1987-1990
Lawrence Livermore National Laboratory, Materials Review Committee, 1988-
Rensselaer Polytechnic Institute, Department of Nuclear Engineering and Engineering Physics, 1989-1995

Rice University, Department of Physics and Astronomy, 1990-
Princeton University Materials Institute Advisory Council, Chairman, 1991-
SUNY Stony Brook, Research, Scholarly and Creative Activity Task Force, 1992-1993
Institute for Theoretical Physics, Santa Barbara, Director Search Committee, 1993-1994
MIT Center for Materials Science and Engineering, Advisory Board, 1994-
University of Missouri Research Reactor Review Committee, 1995

American Physical Society:
Nominating Committee, Division of Solid State Physics, Chairman, 1969-1970
Buckley Prize Committee, 1972, 1977; Chairman 1973
Forum Prize Committee, 1975-1977
Councillor-at-Large, 1976-1980
Executive Committee, 1978-1980
Forum on Physics and Society, Executive Committee, 1975-1978
Professional Concerns Committee, 1977-1980
Nominating Committee, 1985-1987
George Pake Prize Committee, 1986; Chairman, 1987
Panel on Public Affairs, Chairman-elect, 1988-1989; Chairman, 1989-1990
Congressional Fellow Selection Committee, 1978, 1979, 1990
Nominating Committee, Chair-elect, 1995; Chair, 1996

Editorial Boards:
Physical Review, 1965-1968
Comments on Solid State Physics (Co-Editor), 1968-1971
Nuclear Instruments and Methods in Physics Research, 1981-1992
Science'83-'86, 1983-1986
Transport Theory and Statistical Physics, 1984-1990
Encyclopedia of Applied Physics, 1988-

NAS/NAE-National Research Council Committees and Studies:
Panel on Low and Medium Energy Neutrons, 1977
Panel on High Magnetic Fields Research and Facilities, 1978
Solid State Sciences Committee, 1978; Chairman-elect 1979-1981, Chairman, 1981-1983, Past Chairman, 1983-1985
Research Briefing Panel on Materials Science, 1982
Materials Science and Engineering Study Committee, 1985-1989
Panel on Research Opportunities in Radiation Sciences (Naval Studies Board), Chairman, 1988, 1991
Committee on Alternative Applications of Atomic Vapor Laser Isotope Separation Technology, 1990-1991
Committee on Conversion of the Army Research Laboratory, 1993
Future of Space Science, Task Force on Alternate Organizations, 1994-1995

National Science Foundation Committees and Site Visits:
National Magnet Laboratory, 1978
Division of Materials Research Executive Committee, 1979
U.S.-France Materials Research Committee, Bordeaux, 1980
Cornell Materials Research Laboratory, 1982
Cornell Synchrotron Radiation Laboratory (CHESS), 1985
Institute for Theoretical Physics, Santa Barbara, Site Visit (Chairman), 1989

Workshop on Graduate Student and Postdoctoral Education and Training, 1995
National Optical Astronomy Observatories, Site Visit, 1996

Other:

Consultant, Bell Laboratories, 1963-1969
Lecturer, University of Massachusetts, 1967
Visiting Lecturer, Yale University, 1967-1969
Adjunct Professor, University of Rhode Island, 1975
Consultant, Lawrence Livermore Laboratory, 1966-1968
Lecturer, International Center for Theoretical Physics, Trieste, 1967
Advisory Committee, Conferences on Magnetism and Magnetic Materials, 1976-1979
DOE Basic Energy Sciences Laboratory Program Panel, 1977-1990
Energy Research Advisory Board Materials R&D Panel, 1983
U.S. Particle Accelerator School Steering Committee, 1986-1992
Advanced Neutron Source Steering Committee, Oak Ridge National Laboratory, 1987-1991

Superconducting Super Collider Board of Overseers, Universities Research Association, 1985-1993
Southeastern Universities Research Association (SURA) Board of Trustees, 1991-1993
Nassau/Suffolk Bicounty Commission on Peacetime Economics, 1990-1991
Stanford Linear Accelerator Center, Scientific Policy Committee, 1993-1997
Scientific Council of DESY (German Electron Synchrotron), Hamburg, 1995-1998
American Association for the Advancement of Science, Physics Section Nominating Committee, 1996-1999

Honors and Awards:

Phi Beta Kappa, Sigma Xi
Kusaka Prize in Physics, Princeton University
General Electric Fellow, Harvard University
Kennedy Travelling Fellowship, Harvard University
Fulbright Fellowship, Tokyo University, 1959-1960
NSF Grantee, 1973-1977
E.O. Lawrence Award, 1981
American Academy of Arts and Sciences, 1993

Listings

Who's Who in America
Who's Who in Science and Technology
American Men and Women of Science

Research Interests:

Theoretical solid state physics; theory of magnetism; phase transitions, slow neutron scattering; synchrotron radiation.

Lectures and seminars at more than one hundred institutions world-wide. Invited talks and presentations at numerous international conferences, Gordon Research Conferences, meetings of the American Physical Society, AAAS, American Chemical Society, etc. More than one hundred publications in scientific and technical journals and in books.

Martin Blume
Deputy Director
Brookhaven National Laboratory
Upton NY 11973
(516) 344 3735
FAX (516) 344 5803
e-mail: blume@bnl.gov

Experience and Skills:

Administration of Major Research Institutions:
Responsibility for all aspects of management at Brookhaven, including scientific research, engineering development, budgeting, personnel, computing and communications, technical information, etc. Service on Boards of Directors of several large institutions, including the Superconducting Super Collider and CEBAF. Service on advisory panels of the Lawrence Livermore National Laboratory, the Stanford Linear Accelerator Center, and the Princeton Plasma Physics Laboratory.

Management of Scientific Research:
Deputy Director of an institution devoted to research and development with 3200 employees, more than 4000 university and industrial users of research facilities, and an annual budget of more than $400 million. Previously Group Leader of Solid State Theoretical Physics, Head of Solid State Physics, Deputy Chairman of the Physics Department, Chairman of the National Synchrotron Light Source Department (at Brookhaven National Laboratory). Responsible in the Director's Office of BNL for Basic Energy Sciences programs, and later for technology, NRC reactor safety, nuclear non-proliferation, and environmental cleanup programs in the Department of Advanced Technology. Oversight of the Protein Data Bank, a structural biology database of worldwide significance.

Management of Large Scale Technological Projects:
Head of the Design Group for the National Synchrotron Light Source (now the world's largest user facility with more than 2300 users and more than $300 million invested in equipment). Former member of the Board of Overseers of the Superconducting Super Collider and of the Board of the Southeastern Universities Research Association (operator of the Continuous Electron Beam Accelerator Facility - CEBAF). Member of the Scientific Policy Committee of the Stanford Linear Accelerator Center and of DESY - the German Electron Synchrotron Laboratory - in Hamburg, Germany.

Formulation and Implementation of Science and Technology Policy:
Established policy that permitted utilization of major Department of Energy facilities by industrial scientists and engineers for research purposes. Chairman of Solid State Sciences Committee of the National Research Council - National Academy of Sciences (organized and carried out studies of research and development at university, government, and industrial laboratories, and evaluation of development programs sponsored by government agencies). Member of several committees of the National Research Council - National Academy of Sciences (see attached vita) which have played a significant role in formulating policy on advanced materials research in the U. S. Testimony on several occasions before congressional committees and NY State Legislature on research policy and on technology transfer.

Chairman of the Panel on Public Affairs of the American Physical Society, which originates and passes on policy statements of the Society and which originates studies sponsored by the Society.

Promotion of Industry - University - Government Collaboration in Scientific Research and Development:
Arranged for researchers from more than seventy industrial organizations to carry out experiments and development work at the National Synchrotron Light source at Brookhaven. Promoted the development of x-ray lithography at the Light Source by IBM, AT&T, and Motorola engineers. Arranged for collaboration between these researchers and university and National Laboratory scientists. Proposed the development of a new source of x-rays for lithography - funded by DARPA. Responsible for the Department of Advanced Technology at Brookhaven, which has many collaborative programs with industry involving technology development.

Promotion of International Scientific Collaboration:
Fulbright Fellow at Tokyo University and research fellow in England. Leader of U. S. delegation from American Physical Society to first joint European - American Physical Societies meeting (Copenhagen). Leader of U. S. delegations to Japan for joint neutron scattering program. Member of U. S. delegation to Beijing on joint U. S. - China research programs in synchrotron based materials research. Advisor to the Taiwan synchrotron radiation project. Member of the U.S. delegation to the Megascience Forum (of the Organization for Economic Cooperation and Development) Expert Meeting on large research facilities. Member of the Extended Advisory Council of DESY.

Implementation of Environment, Safety, and Health Standards at Research Institutions:
Leader of a Brookhaven Task Force to bring the Laboratory into full compliance with all environmental and occupational safety requirements. Worked with several other laboratories at their request (Lawrence Berkeley Laboratory, Stanford Linear Accelerator Center, Ames Laboratory, and Princeton Plasma Physics Laboratory) to assist them in the same effort. Chairman of the Environment, Safety, and Health Oversight Committee of the SSC Board of Overseers, and member of a similar committee at the Stanford Linear Accelerator Center.

Research in Theoretical Physics:
More than 100 research papers in theoretical physics. Recipient of the E. O. Lawrence Award for outstanding research, 1981. Fellow of the American Physical Society, Fellow of the American Association for the Advancement of Science, Fellow of the New York Academy of Sciences; elected to the American Academy of Arts and Sciences.

Education of Scientists:
Lecturer at Yale University, Professor at State University of New York at Stony Brook. Supervisor of eight theses by Ph. D. students. Supervisor of eight postdoctoral research associates. Lecturer on scientific subjects at more than 100 institutions worldwide.

Personal:
Married to Sheila B. Blume, M. D. (Medical Director of Alcoholism, Drug Abuse, and Compulsive Gambling Programs, South Oaks Hospital, and Clinical Professor of Psychiatry, SUNY at Stony Brook School of Medicine. Formerly New York

State Commissioner of Alcoholism and Alcohol Programs under Governor Hugh Carey.) Two Children, Frederick (a geophysicist in Boulder, Colorado) and Janet (Associate Professor of Engineering at Brown University).
Home: 284 Greene Ave., Sayville NY 11782 (516) 589 7853

Lewis R. Carroll
Carroll/Ramsey Associates
950 Gilman Street
Berkeley, CA 94710
'phone (510) 559-8153
fax (510) 559-8158

Professional craft skills and specialties

Specialized RF System Design
Radiation Science; Shielding , Safety, and Instrumentation
Power and Control Systems Design and Engineering
Project Management at all levels, including
design, development, implementation, installation
and commissioning.

Chronology

- Present. General Partner, Carroll/Ramsey Associates, Berkeley, CA; Consultants providing service and technical support to the community of accelerator builders and users, including leading cyclotron manufacturers, U.S. Department of Energy National Laboratories, University Research and Clinical PET imaging centers, and commercial isotope manufacturers.

- Oct. 1992--Oct 1993. Director of Cyclotron Development, CTI Cyclotron Systems, Knoxville, TN. Overall responsibility for design and development of accelerators, targetry, components, and subsystems for production of short-lived isotopes for Positron Emission Tomography (PET).

- 1991 through 1992. Manager of Research and Development, CTI Cyclotron Systems, Berkeley, CA. Conceptual, proof-of-principle, and prototype development of cyclotrons, targetry, shielding, components, and subsystems for PET. Radiation Safety Officer; responsible for radiation protection, supervision, training, and overall compliance with State and Federal regulations.

- 1984 to 1991. Manager of Systems Integration, CTI Cyclotron Systems. Responsible for radiation safety and shielding design, electrical engineering, including power, RF, and control system hardware and software design and development.

- 1975 to 1983 The Cyclotron Corporation, Berkeley, CA; System Architect and Program Manager for development of PET scanner systems.

- 1969 to 1975 The Cyclotron Corporation; Lead Engineer -- development and production engineering of precision, high-voltage, and high-current power supplies, cyclotron RF systems. NMR gaussmeter, and "Multiscan" whole-body radioisotope scanner.

Education

B.S Electrical Engineering, Wayne State University - Detroit Michigan, 1964

M.S. Electrical Engineering, Stanford University, 1966

Professional Associations

Institute of Electrical and Electronic Engineers (IEEE)
American Association for the Advancement of Science (AAAS)

Publications

Carroll LR, Hendry GO, and Currin JD: Design Criteria for Multi-Slice Positron Emission-Computed Tomography Detector Systems", IEEE Trans. Nucl. Sci. Feb 1980.

Carroll LR "Design and Performance Characteristics of a Production Model Positron Imaging System", IEEE Trans. Nucl. Sci., Feb 1978.

Hendry GO, Carroll LR, Jenkins KD: "A Pulse Selection and Shortening System for Cyclotrons". IEEE Trans. Nucl. Sci., Apr 1979.

Carroll LR "Underlying Concepts in Positron Computed Tomography System Design". Invited paper ANS International Conference, Washington, D.C., Nov 1980.

Carroll LR, Kretz PR, Orcutt: "The Orbiting Rod Source: Improving Performance in PET Transmission Scans". Presented at the 30th Annual Meeting of the Society of Nuclear Medicine, St. Louis, June 1983. Published in Emission Computed Tomography--Current Trends Society of Nuclear Medicine, New York, 1983.

Kearfott K, Carroll LR: "Performance characteristics of the Model 4600 Positron Emission Tomograph". JCAT, June 1984.

Carroll LR, Pekrul E: "Radiation Measurements in the Design and Evaluation of a Self-Shielded Accelerator for PET". Proceedings of the Twentieth Midyear Topical Symposium of the Heath Physics Society. Reno, Nevada, Feb 1987.

BIOGRAPHICAL INFORMATION

Albert E. Evans

Education: B.S. (Physics) Yale University, 1952
M.S. (Physics) Ohio State University, 1953
Ph.D., Nuclear Physics, University of Maryland, 1965

Current Position: Physicist, Energy Research Office of Basic Energy Sciences, USDOE (since 11/90)

Environment, Safety, and Health staff advisor
Member, Accelerator Safety Order Policy Committee
Member, DOE Nuclear Criticality Experiments Steering Committee

Professional Societies/ Activities
Member, American Physical Society
Member, American Nuclear Society
IEEE Affiliate, Nuclear Science & Plasma Physics
Member, Health Physics Society
Affiliate, American Board of Health Physics
Member, ANSI/HPS Writing Group N43.4 (Accelerator Safety Standard)

Previous Experience:

9/52-12/56	U.S. Air Force. Nuclear Research Officer
3/57-7/58	Martin Co. Nuclear Division. Critical Facility Engineer
8/58-5/67	U.S. Naval Ordnance Laboratory. Experimental Nuclear Physicist. Accelerator Construction, Operation, and Research
5/67-7/75	Los Alamos National Laboratory, Nuclear Safeguards Group. Nuclear Assay Measurements Development, Accelerator construction and Management.
8/75-2/86	Los Alamos National Laboratory, Advanced Nuclear Technology Group. Critical Facility Crew Chief, Nuclear Instrumentation Development.
2/86-11/90	U. S. Department of Energy, Defense Programs Office of Weapons Research, Development, & Testing. Program Staff Member

DOE TRAINING: Weapon Program Management PGM01-PGM05, Tiger Team, Conduct of Operations, Accident Investigation,

Hazardous Materials Handling, Configuration Management, Rad Worker II, others

ROSS W. FISHER, Ph. D., CIH

EDUCATION: Ph.D., Pharmaceutical Chemistry, University of California, San Francisco, 1979

B.S., Chemistry, University of California at Berkeley, 1974

REGISTRATION: Certified Industrial Hygienist Comprehensive Practice, #2862

EXPERIENCE:

Dr. Fisher is currently Safety and Health Services Area Manager in Bechtel National, Inc. Dr. Fisher is an industrial hygienist certified by the American Board of Industrial Hygiene with seventeen years experience including government compliance activity. He has performed recognition, evaluation, and control of harmful chemical, biological, and physical agents and safety hazards for field remediation and emergency response situations, as well as for employees in a diversity of construction, manufacturing, heavy industrial and service industries. He has served as a technical consultant on the Cal/OSHA AB1111 respiratory protection standard review and revision committee and has served on the American Industrial Hygiene Association, Confined Space Committee.

Dr. Fisher has prepared, implemented, and managed safety and health programs for a multitude of both private sector and government hazardous waste site characterization, remediation, and construction projects, including the number one NPL and the foremost California EPA Superfund sites. He has been responsible for administration of safety, health, and medical surveillance programs, workers compensation, and government compliance and associated record keeping to comply with DMV, DOT, OSHA, EPA, DOHS, and other local, state, and federal regulations. He has been responsible for the regulatory compliance at a permitted hazardous waste facility and has been responsible for daily management of remediation, industrial services, decontamination, site mitigation, chemical packaging/disposal, and emergency response projects. Dr. Fisher has been responsible as a safety and health officer and operations manager for on-site industrial and hazardous wastewater and sludge treatment systems and has performed safety and health inspections, training, program development and preconstruction design review for a liquid hazardous waste treatment plant.

Dr. Fisher has provided technical support for the safety, health, and loss control program for the worlds foremost construction company, an engineering consulting group, an analytical laboratory, five hazardous waste disposal/treatment facilities, a field industrial and environmental services group, four transportation groups, and an environmental emergency response service. Activities included internal audits, safety and industrial hygiene monitoring, and surveillance; provision of employee safety and health training; development and approval of emergency procedures; provision of technical support to research, development, and operations groups; and reviewing safety and health and operations plans and proposals.

As an Associate Industrial Hygienist for the State of California's Division of Occupational Safety and Health, Dr. Fisher performed industrial hygiene and safety compliance surveys and inspections in a wide spectrum of construction and general industry work settings and circumstances, conducted employee and employer occupational health training program development and presentation, and conducted meetings with professional and community groups.

BIOGRAPHICAL SKETCH
for
William S. Freeman

CURRENT POSITION:
Assistant Division Head for Environment Safety & Health - Research Division

CURRENT EMPLOYER:
Fermi National Accelerator Laboratory - MS-208
P.O. Box 500
Batavia. IL 60510

EDUCATION
B. S. - Physics - North Carolina State University (1975)
M.A. - Physics - State University of New York, Stony Brook (1976)
Ph. D. - Nuclear Physics - State University of New York, Stony Brook (1981)

PROFESSIONAL EXPERIENCE
October 1992 - present - Assistant Division Head for Environment, Safety, and Health, Fermilab Research Division; responsible for developing and implementing safety policies and procedures for the Research Division; monitoring Research Division compliance with Laboratory policies and procedures; advising other Research Division senior management personnel on ES&H matters; Senior Safety Officer for Research Division.

August, 1989, September, 1992 - Group Leader, Environment Safety and Health Department, Fermilab Research Division; responsible for supervising safety personnel in all areas of conventional and radiation safety for the Research Division; developing and implementing safety policies and procedures for the Research Division; monitoring compliance with Laboratory policies and procedures; Senior Safety Officer for Research Division.

October 1984 - August 1989 - Group Leader, Radiation Physics Group, Fermilab Safety Section; responsible for supervising the radiation physics staff, supervising the personnel dosimetry program of the Laboratory, supervising a program of specialized radiation monitoring for the Fermilab site, monitoring Laboratory compliance with DOE and Laboratory policies and procedures through a program of internal audits and appraisals in radiation safety; editor, Fermilab Radiation Guide.

June 1983 - October 1984 - Engineering Physicist, Fermilab Radiation Physics Group; responsible for radiation shielding design, specialized radiation monitoring and instrument development, and related computer software development and maintenance.

December, 1980 - June 1983 - Post-doctoral Research Associate, Physics Division, Argonne National Laboratory; basic research in experimental heavy ion nuclear physics at the ANL ATLAS accelerator.

PROFESSIONAL ACTIVITIES
Member, American Physical Society
Division of Particles and Fields
Division of Nuclear Physics
Former Member, U. S. Department of Energy Advisory Panel on Accelerator Radiation Safety
Member, ΦΚΦ Academic Honor Society
Member, SPS Physics Honor Society

Eugene W. Lau

Education:

Bachelor of Arts in Bacteriology - UC Berkeley

Professional Certification:

* Certified Industrial Hygienist, American Board of Industrial Hygienist (C.I.H.)
* Certified Safety Professional, Board of Certified Safety Professional (C.S.P.)
* Certified Hazardous Materials Manager (C.H.M.M.)
* Registered Environmental Health Specialist, State of California (R.E.H.S.)

Experience:

University of California, S.F. (Current Employer)
Program Manager - Clinical Program
Managed different health & safety programs within the Environmental Health & Safety Office in the past five years. Participate in all aspects of health and safety. Attend campus Biosafety Committee, Chemical Safety Committee, Medical Center Infection Control Committee and other committees.

Harding & Lawson Associates
Senior Industrial Hygienist - Oversaw asbestos abatement projects. Conducted phase 1 survey of commercial properties. Conducted field surveys and provided health and safety supports for field staff. Responsible for safety plan review and in-house health and safety program.

Department of Toxic Substances Control (DTSC), Cal/EPA
Regional Industrial Hygienist - Managed in-house health & safety program. Conducted training. Reviewed health and safety plans submitted by consulting companies for site cleanup. Reviewed health and safety procedures prior to DTSC inspector's field visits. Accompanied inspectors for field visits and monitored exposures as needed.

Cal/OSHA
Cal/OSHA inspector - conducted workplace inspections & accident investigations, and participated in hearings.

Department of Public Health, City & County of San Francisco
Sanitarian: Conducted health and sanitation related inspections.

Others:

Certified in Emergency Response: 40 hours Hazardous Waste Operations & Emergency Response
AHERA asbestos management trained (no longer current)

BRIEF CURRICULUM VITAE

JAMES O. JACKSON

BUSINESS ADDRESS

Lawrence Livermore National Laboratory
P.O. Box 5505, L-382
Livermore, California 94550
Phone: (510) 422-4256
Fax: (510) 422-3325

HOME ADDRESS

866 Waverly Common
Livermore, California 94550
(510) 447-5202

EDUCATION

BS Chemistry/Chemical Engineering, Detroit Institute of Technology, 1968
MS Industrial Hygiene, Wayne State University, 1970
PhD Environmental Health Sciences, The University of Michigan 1974

EMPLOYMENT

University of California, Lawrence Livermore National Laboratory, Livermore, California
- 11/93 - Present Deputy Department Head, Hazards Control Department
- 11/92 - 10/93 Health and Safety Division Leader, Hazards Control Department

Los Alamos National Laboratory, Los Alamos, New Mexico
- 03/91 - 11/92 Acting Health and Safety Division Leader
- 03/90 - 03/91 Deputy Health and Safety Division Leader for Occupational Health and Safety
- 08/80 - 03/90 Group Leader, Industrial Hygiene Group

University of Arizona, Tucson, Arizona
- 03/79 - 07/80 Associate Professor, College of Health Related Professions and College of Engineering

Gulf Oil Corporation, Pittsburgh, Pennsylvania
- 10/76 - 02/79 Director of Industrial Hygiene
- 11/74 - 09/76 Industrial Hygiene Laboratory Director

Wayne County Health Department, Detroit, Michigan
- 05/69 - 10/74 Chemist and Field Engineer

Michigan Consolidated Gas Company, Detroit Michigan
- 06/68 - 05/69 Management Trainee and Reservoir Engineer

General Motors Research Laboratories, Warren, Michigan
- 04/66 - 05/68 Chemical Technician

PROFESSIONAL ASSOCIATIONS

American Academy of Industrial Hygiene
American Chemical Society
American Conference of Governmental Industrial Hygienists
- Currently Vice-Chair: Become Chair 5/95
American Industrial Hygiene Association
American Institute of Chemical Engineers
American Society of Safety Engineers
British Occupational Hygiene Society

- Served as Member and Chair of various Committees and Task Forces for the above seven professional organizations
- Member of several Local Sections/Councils

OTHER

Certified Industrial Hygienist by the American Board of Industrial Hygiene

Fellow of the American Institute of Chemists/Chemical Engineers

Recipient, State of Michigan Public Health Fellowship

Recipient, 1st Annual Environmental Quality Award, US EPA

Member of Los Alamos Emergency Planning Council (LANL Representative)

Member, Budget and Futures Committees, Los Alamos High School Governing Council

Member, Advisory Council for the Arizona Center for Occupational Safety and Health

Member, Board of Directors, Los Alamos Retirement Center

Member, Occupational Safety and Health Advisory Council, State of New Mexico

Member, Toxic Substances Research and Teaching Program, University of California

Affiliate Faculty Member, Colorado State University

Adjunct Faculty Member, University of California at Los Angeles

Numerous presentations and publications

Consultant Practice

LARRY A. JONES, P.E.
15 Toltec Road
Santa Fe, NM 87505
hm (505) 982-1189
wk (505) 667-0142

WORK EXPERIENCE

3/94 to Present: **FSS-2, STANDARDS & COMPETENCY GROUP LEADER**, Los Alamos National Laboratory, New Mexico. Responsibilities include: (1) leading a standards document development publishing team; (2) working with other engineers outside the group to develop technical facility construction and maintenance documents; (3) working with process owners outside the Group to write FSS Division procedures; and (4) measuring division operations and process success through the collection of metrics.

2/93 to 3/94: **PROJECT DEVELOPMENT SECTION LEADER** at ENG-3, Los Alamos National Laboratory, New Mexico. Responsibilities included: (1) acting as point of contact for resources to produce conceptual design documents (CDRs, Studies) for expense, GPP and LI Projects; (2) assigning work to the Project Development Team according to work load and priorities; (3) handling personnel issues; (4) acting as a central point of contact to Civil, Structural, Surveying, Drafting and Specifications Standards; and (5) performing Group Leader activities upon his absence.

12/90 to 2/93: **CIVIL/STRUCTURAL SECTION LEADER** at ENG-3, Los Alamos National Laboratory, New Mexico. Responsibilities included: (1) acting as point of contact for resources to perform Civil and Structural design and design oversight; (2) assigning and balancing work loads to design teams in a matrix organization ; (3) setting priorities for Civil/Structural design work; (4) handling personnel issues such as hiring, training, disciplinary actions, raises and performanceevaluations; (5) acting as a central point of contact for Civil and Structural Standards, Standards Specifications and Guideline Design Criteria documents; and (6) developing techniques to ensure quality in the Civil/Structural designs.

8/89 to 12/90: **QUALITY CONTROL/VALUE ENGINEERING COORDINATOR** at ENG-3, Los Alamos National Laboratory, New Mexico. Responsibilities included: (1) performing interdisciplinary quality control reviews on ENG-3 preliminary, criteria and construction documents; (2) developing and updating guideline Conceptual Design Reports, Design Criteria and technical specification documents; (3) working closely with ENG-3 design teams, MAT-7 and Legal to coordinate construction documents acceptable to all; (4) coordinating and participating in Value Engineering studies on Line Item size projects; and (5) acting as a central resource person for guideline construction documents, QC concerns and Value Engineering.

9/76 to 3/89: **ENGINEERING SUPERVISOR/MANAGER** at DeLapp Engineering Corporation, Santa Fe, New Mexico. Responsibilities included: (1) organizing structural design teams by task assignment and overseeing and reviewing of other engineers and draftsmen; (2) scheduling numerous projects simultaneously to ensure orderly completion of jobs on schedule; (3) working as a Structural Engineering Consultant to architects and planners on all phases of building projects from the preliminary drawings through actual construction and submittal review; (4) choosing structural systems for new buildings, additions and renovations based on cost estimates and facility use; (5) performing calculations for all types of structural systems and components and sketching plan layouts and structural details; (6) writing and editing structural specifications; (7) writing reports such as system proposals, cost estimates, structural problem solutions, repair recommendations, existing structural evaluations, and construction inspection reports; (8) providing cost of services proposals; (9) direct involvement with the hiring, supervising and evaluation of office professional staff; and (10) writing structural design programs and using other engineering software.

Examples of projects completed under my direction are the **Santa Fe Capital High School**, the **Questa High School**, the **Highlands University Gymnasium Facility** in Las Vegas, the **Espanola Community College Campus** buildings, the **Natural History Museum in Albuquerque**, the **Sandoval Street Parking Garage** in Santa Fe, and the **Montoya State Office Building** in Santa Fe. These facilities incorporated all types of building materials and structural systems including concrete (cast in place, postension and prestressed), masonry, structural steel and wood.

9/74 to 4/76: **STRUCTURAL ENGINEERING DESIGNER** at Krause Engineering, Santa Fe, New Mexico. Responsibilities included: (1) working within a structural design team to produce completed structural systems and materials and using applicable building codes; (3) supplying structural sketches and instructions to draftsmen; (4) conducting on-site inspections of building projects; and (5) participating in load testing of existing structures.

Examples of projects I was directly involved in are the VIP seating area at the **University of New Mexico Football Stadium**, **Shiprock Elementary School**, **DeVargas Mall**, and the **Santa Fe High School Gymnasium**.

8/72 to 5/74: **STRUCTURAL ENGINEERING TRAINEE** for Willis Regier, A.I.A., Omaha, Nebraska. Responsibilities included: (1) working within a complete "in-house" A/E design team that contained staff from all architectural and engineering disciplines; (2) performing structural calculations for meat packing plants; and (3) conducting on-site inspections of projects under construction.

6/70 to 9/70: **SURVEY CREW** for U.S. Forest Service, Anchorage, Alaska. Responsibilities included: (1) performing field reconnaissance surveying for roads and trails; (2) participating in road layout with a survey crew; and (3) doing survey plat layout and drafting.

8/67 to 7/69: **CONSTRUCTION AND AGRICULTURE ADVISER IN THE MARSHALL ISLANDS** for Action, Peace Corps, Washington, D.C. Responsibilities included: (1) designing and supervising the construction of school and medical buildings; (2) organizing local people into cooperatives; and (3) supervising coconut grove replanting.

EDUCATION AND MISCELLANEOUS

1964 to 1966, Iowa State University, Ames, Iowa. Obtained 57 credit hours in architecture/engineering field.

1972, June, B.S. in Civil Engineering Civil Engineering, University of Nebraska, Lincoln, Nebraska.

1971, E.I.T., Nebraska #2645

1977, New Mexico Professional Engineer Registration #6449

1987, National Council of Engineering Examiners Registration #7697

Member of International Council of Building Code Officials (ICBO)

BIOGRAPHICAL INFORMATION
Michael E. Lichtenstein

SUMMARY

A seasoned professional with over twenty-nine years experience in Environmental Safety and Health program management in aerospace and electronics industries. Major strengths in leading diverse teams of technical professionals to develop and audit preventive programs, using planning, organizing and facilitating skills. Additional skills in teaching other professionals and in preparing and presenting regulatory and legislative discussion materials. A respected, thorough, well organized leader in Environmental Safety and Health.

EDUCATION

Bachelor of Science, School of Public Health, University of California at Berkeley, 1961
(Plus numerous ES/H Short Courses at NIOSH, UC Santa Cruz, etc.; guest instructor at UCB in BEHS 244)

CERTIFICATIONS & AFFILIATIONS

1977- Present	- **Registered Professional Engineer** (Safety), (#SF 1984), California **(PE)**
1974- Present	- Diplomate, American Academy of Industrial Hygiene, (#915) **(CIH)** ***(Certified in the Comprehensive Practice of Industrial Hygiene)***
1992- June 1996	- **Registered Environmental Assessor**, (# REA-04389), California **(REA)**
1973- Present	- Full member, *American Industrial Hygiene Association (and Local Sections)*
1993- Present	- Affiliate Member, *American Conference of Governmental Industrial Hygienists*
1988- 1992	- Member, American Electronics Association Environmental/ Occupational Health- California Regulatory Affairs Committee
1989 - 1993	- Member, Genetic and Toxicology Association (GETA)
1987- 1992	- Santa Clara County Manufacturing Group, Environmental Committee (Chair of *Clean Air Task Force* 1988-89)
1983- 1987	- Professional Member, American Society of Safety Engineers
1981- 1986	- Member, American Electronics Association Association, Occupational Safety and Health Committee
1981- 1988	- Member, California Manufacturers Association, Safety and Health (S/H) [steering] Committee

CURRENT POSITION

Owner and sole proprietor of ***Lichtenstein Associates,*** a matrix managed consulting business to provide expertise and assistance to organizations wishing to establish, upgrade or manage preventive Environmental Safety and Health programs. (Since July 1992)

PROFESSIONAL EXPERIENCE

1978- 1992 - ***International Business Machines [IBM] Corporation [San Jose, CA]***

1987- 92	Environmental Hygienist, IBM/ADSTAR, **Environmental Programs Department**
1982- 87	Program Manager of Occupational Safety and Health, **IBM, GPD Headquarters**
1979- 82	Manager of Industrial Hygiene, **IBM, General Products Division (GPD)**
1978- 79	Staff Industrial Hygienist, **IBM, General Products Division (GPD)**

1967 -1978 - Industrial Hygiene Engineer, ***Boeing Aerospace Company, [Seattle, WA]***

PAPERS PUBLISHED/ PUBLICATIONS

1. "Small Business and Preventive Ergonomics Programs," M.E. Lichtenstein, *Proceedings of ErgoCon95*, San Jose State University- Silicon Valley Ergonomics Institute (1995)

2. Chapter 3: General Management Principles; M.E. Lichtenstein in *Industrial Hygiene Management* (Garrett, Cralley and Cralley), John Wiley & Sons (1988)

3. "Megatrends and the Occupational Safety & Health Professional;" M.E. Lichtenstein; Guest Editorial, *American Industrial Hygiene Association Journal 45:A-17* (1984)

4. "Developing and Managing and Industrial Hygiene Program;" M.E. Lichtenstein, T.G. Buchanan and J.C. Nohrden; *American Industrial Hygiene Association Journal 44:256* (1983)

5. "Industrial Hygiene Career Planning;" C.A. Bardsley, M.E. Lichtenstein and V.A. Nusbaum; *American Industrial Hygiene Association Journal 44:256* (1983)

6. *Planning for People in Clean Rooms - A Technical Symposium*; Proceedings of 11th Corporate Contamination Control Seminar, IBM General Technology Division, East Fishkill, New York (*IBM Confidential*- 1982).

7. *Industrial Hygiene Surveying Techniques* - Course Notes, Lesson Plan and Instructor Notes; National Institute for Occupational Safety and Health. (NIOSH 68900 & 68901; prepared under contract- 1977)

8. *Hygienic Guide Series - Cobalt;* American Industrial Hygiene Association (1977)

9. "Tungsten Carbide Pulmonary Fibrosis - A Case Report," F. Bartl, MD and M.E. Lichtenstein; *American Industrial Hygiene Association Journal 37:688* (1977).

10. "Control of Cobalt Exposures During Wet Process Tungsten Carbide Grinding," M.E. Lichtenstein, F.D. Bartl, MD and R.T. Pierce; *American Industrial Hygiene Association Journal 37:879 (1975).*

ADDRESS, Etc.

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E-Mail: JRXH88A@prodigy.com

CURRICULUM VITAE
ROBERT W. M^c^KINNEY

BIRTH DATE: April 20, 1924

BIRTHPLACE: Terre Haute, Indiana, U.S.A.

MARITAL STATUS: Married

EDUCATION: 1956, Ph.D., Epidemiologic Science
University of Michigan, Ann Arbor, Michigan
1949, M.S., Microbiology, New York University, New York, New York
1947, B.S., Major Microbiology, Indiana State University, Terre Haute, Indiana

EMPLOYMENT:

1987-Present	National Institutes of Health, Bethesda, Maryland Director, Division of Safety
1980-1987	National Institutes of Health, Bethesda, Maryland Chief, Occupational Safety and Health Branch
1976-1980	Enviro Control, Rockville, Maryland Program Manager
1970-1976	Microbiological Associates, Inc., Walkersville, Maryland Director of Production
1968-1970	U.S. Army Medical Research Institute of Infectious Diseases, Ft. Detrick, Maryland Chief, Virology Division
1967-1968	9th Medical General Laboratory, Republic of Viet Nam Chief, Microbiology
1960-1967	U.S. Army Medical Research Institute of Infectious Diseases, Ft. Detrick, Maryland Chief, Virology Division
1956-1960	6th Army Medical Laboratory, Ft. Baker, California Chief, Immunology Division

1952-1953	6th Army Medical Laboratory, Ft. Baker, California Assistant Chief, Immunology Division
1952-1953	U.S. Army Hospital, Indiantown Gap, Pennsylvania Laboratory Officer
1949-1951	Maryland State Department of Health, Easton, Maryland Chief, Branch Laboratory

OTHER PROFESSIONAL ACTIVITIES

1947-1949	Teaching Fellowship, New York University
1969	Advisor to Ministries of Agriculture of Guatemala, El Salvador, Honduras, and Nicaragua
1967-1968	Member, Joint USAID Commission on Infectious Diseases, Republic of Viet Nam
1980-1985	Member, Recombinant DNA Advisory Committee National Institutes of Health
1981-1985	Co-Chairman, Large Scale Working Group, Recombinant DNA Advisory Committee National Institutes of Health
1982-1991	Adjunct Assistant Professor, School of Public Health University of North Carolina
1987-Present	Member, U.S. Environmental Protection Agency's Biotechnology Science Advisory Committee
1987-Present	Director, World Health Organization Collaborating Centre for Laboratory Safety

PROFESSIONAL AFFILIATIONS

Diplomate, American Board of Medical Virology, Public Health and Medical Virology
Tissue Culture Association
American Society Tropical Medicine and Hygiene
AAAS

HONORS

Legion of Merit
Meritorious Service Medal
Bronze Star
Commendation Medal
NIH Merit Award
NIH Director's Award

PUBLICATIONS - ROBERT W. M^cKINNEY

Berlin, B.S. and McKinney, R.W.: A simple device for making emulsified vaccines. J. Lab. Clin. Med., 52:657-658, 1958.

McKinney, R.W., England, B.L. and Froede, S.: Studies with heamadsorption virus type 1. I. Recovery from two cases of influenza-like disease in Military Personnel and related investigations. Amer. J. Hyg., 70:280-296, 1959.

McKinney, R.W., Berge, T.O., Sawyer, W.D., Tigertt, W.D., Crozier, D.: Use of an attenuated strain of Venezuelan Equine Encephalomyelitis Virus for Immunization in Man. Amer. J. Trop. Med. Hyg., 12:597-603, 1964.

French, G.R. and McKinney, R.W.: Use of Beta-Propiolactone in preparation of inactivated Arbovirus Serologic Test Antigens. J. Immunol., 92:772-778, 1964.

Smith, T.J., McKinney, R.W. and Sawyer, W.D.: Isolation of Venezuelan Equine Encephalomyelitis Virus by Bone Marrow Culture. Proc. Soc. Exp. Biol. and Med., 117:271-275, 1964.

Taber, L.E., Hogge, A.L. and McKinney, R.W.: Experimental infection of dogs with two strains of Venezuelan Equine Encephalomyelitis Virus. Amer. J. Trop. Med. Hyg., 14:647-651, 1965.

McKinney, R.W.: Arbovirus infections of laboratory worker. Science, 158:3806, 1283, 1967.

Alevizatos, C.A., McKinney, R.W. and Feigin, R.D.: Live, attenuated Venezuelan Equine Encephalomyelitis Virus Vaccine. I. Clinical effects in man. Amer. J. Trop. Med. Hyg., 16(6):762-768, 1967.

Feigin, R.D., Jaeger, R.F., McKinney, R.W. and Alevizatos, A.C.: Live, attenuated Venezuelan Equine Encephalomyelitis Virus Vaccine. II. Whole-blood aminoacid and fluorescent-antibody studies following immunization. Amer. J. Trop. Med. Hyg., 16(6):769-777, 1967.

McKinney, R.W. and Davenport, F.M.: Studies on the mechanism of action of emulsified vaccines. J. Immunol., 86:91-100, 1969.

Cole, F.E., Jr. and McKinney, R.W.: Use of hamsters for potency assay Eastern and Western Equine Encephalitis vaccines. Applied Microbiology, 17(6):927-928, 1969.

Maire, L.F., III., McKinney, R.W. and Cole, F.E., Jr.: An inactivated Eastern Equine Encephalomyelitis vaccine propagated in chick embryo cell culture. I. Production and testing. Amer. J. Trop. Med. Hyg., 19:119-122, 1970.

Calia, F.M., Bartelloni, P.J., and McKinney, R.W.: Rocky Mountain Spotted Fever: Laboratory infection in a vaccinated individual. JAMA, 211:2012-2013, 1970.

Spertzel, R.O. and McKinney, R.W.: V.E.E., A Disease on the move. Proc. 74th Ann. Mtg., U.S. Animal Health Assoc., 268-275, 1970.

Leavitt, N.H., Amsler, K.R. and McKinney, R.W.: Rapid detection of viral antibody by cellulose acetate electrophoresis. Applied Microbiology, 22(1):144-146, 1971.

Bartelloni, P.J., McKinney, R.W., Calia, F.M., Ramsburg, H.H. and Cole, F.E., Jr.: Inactivated Western Equine Encephalomyelitis vaccine propagated in chick embryo cell culture. Amer. J. Trop. Med. Hyg., 20(1):146-149, 1971.

Spertzel, R.O. and McKinney, R.W.: V.E.E. - A disease on the move. Amer. Assoc. Animal Diseases, 1971.

Leavitt, N.H., Amsler, K.R., McKinney, R.W.: Cross-protection in hamsters immunized with Group A arbovirus vaccines. Infection and immunity, 137(12):441-445, 1972.

McKinney, R.W.: Inactivated and Live V.E.E. Vaccines - A Review. Pan American Health Organization Scientific Publication No. 243, 1973.

Leavitt, N.H., Amsler, K.R., McKinney, R.W. and Robinson, D.M.: A Microprecipitation Test for the detection of Adenovirus Antibody. Life Sciences, 15:37-44, 1974.

McKinney, R.W., Pelham, V.F., and Hellman, A.: Medical Surveillance Program of the National Cancer Institute. Proceedings, Third Annual Symposium on Computer Application in Medical Care, pp. 428-429. Washington, D.C., October 14-17, 1979. Ed. R.A. Dunn. Publisher-Institute of Electronic Engineers, New York, N.Y.

McKinney, R.W.: Biological Containment - Considerations int he Design and Operation of Biological Research Facility. Canadian Research, 1979.

McKinney, R.W.: Operational Concepts and Facility Plan in Design of Biomedical Research Facilities, Cancer Research Safety Monograph Series, Volume 4, U.S. Dept. Health and Human Services, PHS, NIH, (NIH Publication No. 81-2305), 1979.

West, D.L., Twardzik, D.R., McKinney, R.W., Barkley, W.E., and Hellman, A.: Identification, Analysis and Control of Biohazards in Viral Cancer Research. Chapter 6 in Laboratory Safety, Theory and Practice. Ed. A.A. Fuscaldo, B.J. Erlick, and B. Hindman. Academic Press, New York, 1980.

Barkley, W.E., Wedum, A.G., and McKinney, R.W.: The Hazard of Infectious Agents in Microbiologic Laboratories. Chap. 31 in Disinfection, Sterilization, and Preservation. Ed. Seymour S. Block, Lea and Febriger, Philadelphia, 1983.

McKinney, R.W., Barkley, W.E., and Wedum, A.G.: The Hazard of Infectious Agents in Microbiologic Laboratories. Chap. 43 in Disinfection, Sterilization, and Preservation. Ed. Seymour S. Block, Lea and Febriger, Philadelphia, 1991

Richmond, J.Y. and McKinney, R.W. (Co-Editors): Biosafety in Microbiological and Biomedical Laboratories, 3rd. Edition, Center for Disease Control and Prevention and National Institutes of Health, PHS, USDHHS. U.S. Government Printing Office, (HHS Publication No. (CDC) 93-8395, 1993.

Resume for Joe Juetten
LBNL Work Smart Standards Convened Group

WORK HISTORY

MAY, 1990 TO PRESENT:
Director of Environment, Safety, and Health Division, DOE Oakland Office. Manages and leads a staff of about 20 professional scientists and engineers who provide technical support to DOE project and program managers in the areas of construction safety , radiation protection, fire protection, industrial health and industrial hygiene, nuclear facilities safety, and compliance with clean air, clean, water, waste management, environmental cleanup and other environmental laws.

Programs and projects supported are primarily at Lawrence Berkelely National Laboratory, Lawrence Livermore National Laboratory, and Stanford Linear Accelerator Center.

Also represents Oakland office on DOE wide activities such as developing ES&H policies and standards, defining agency roles and responsibilities, and changing ES&H systems.

MAY, 1983 TO MAY, 1990:
Branch Chief for Safety, Health, and Quality Assurance, DOE Oakland Office.

SEPT, 1970 TO MAY, 1983:
Various staff functions in the AEC then ERDA then DOE regional office. Primary function during this period was as this office's only fire protection engineer, but also served as office lead for NEPA compliance for approximately two years, as lead for oversight of conventional explosives safety and of natural phenomena (earthquake) protection.

EDUCATION:
1956-58: Marquette University; mechanical engineering. No degree
1958-61: University of North Dakota; English, general science, education. PhB.
1977-78: JFK University; School of Law. No degree.

Specialty and University extension courses in excess of 1000 hours in fire protection engineering, safety and health, environmental laws and regulations, and management.

OTHER:
- Registered Fire Protection Engineer, State of California (current).
- Certified Chairperson, DOE Accident Investigation Program.
- Current Q clearance

David Michlewicz, CHP, has over 20 years of experience in radiological safety assessment of practically all aspects of the nuclear fuel cycle.

Since March 1994, Mr. Michlewicz has been an Environment, Safety and Health (ES&H) Program Manager in the Office of Energy Research (ER), U.S. Department of Energy, responsible for oversight of ER's Multiprogram Energy Laboratories' plans and activities related to environment, safety and health. His duties include review of ES&H Management Plans, implementation plans for nuclear safety orders and related rules, Corrective Action Reports, appraisals, etc.; providing technical advice and guidance to Program and Field management; evaluation of the scope and justification of ES&H program requirements proposed by laboratory contractors; preparation of budget materials, including the Pre-Internal Review Budget (IRB), IRB, OMB and Congressional budgets; and oversight of execution of approved activities.

From 1992 to 1994, Mr. Michlewicz was assigned to the Environmental and Regulatory Support Division, Office of Engineering and Operations Support, Defense Programs, where he was responsible for providing technical support related to radiological safety and environmental protection to Headquarters line management for all Defense Programs facilities. His responsibilities included technical consultation and advice to assure that DP facilities are operated in accordance with Department of Energy radiation protection requirements; providing expert technical guidance to program and field management in establishing and implementing radiation protection programs; conducting technical appraisals in coordination with DP Program Offices; coordination with other DOE elements on matters involving radiation protection and safety and keeping DP management aware of activities that may affect DP programs. He was the Radiological Control Program Advisor for Defense Programs and represented DP on the Radiological Control Coordinating Committee established pursuant to Article 155 of the DOE Radiological Control Manual.

Prior to that assignment, since joining DOE in 1992, Mr. Michlewicz was responsible for providing technical and programmatic oversight of the radiological safety and environmental protection aspects of reactor restart at the Savannah River Site.

Before joining DOE, Mr. Michlewicz was Manager, Performance and Safety Assessment Section, in the Weston Technical Support Team to DOE's Office of Civilian Radioactive Waste Management (OCRWM). During the five years on the Technical Support Team, Mr. Michlewicz provided support to OCRWM in the area of performance and safety assessment. This included review of regulations, orders, technical positions, etc., pertinent to the

performance/safety aspects of the program, development of performance/safety assessment plans, preparation of programmatic documents, providing technical guidance and oversight of performance assessment studies, and preparation and presentation of relevant materials at public meetings.

During the previous nine years with Ebasco Services Inc., Mr. Michlewicz directed or was involved in numerous studies of the radiological impacts of various nuclear facilities, including approximately ten nuclear power reactors, a prospective geologic repository and contaminated sites. For two years before that, Mr. Michlewicz was with the U.S. Environmental Protection Agency, responsible for review of environmental impact statements, development of Agency guidance for radiological emergency preparedness, and assessment of technologically enhanced sources of radiation

Mr. Michlewicz holds B.S. and M.S. degrees in Nuclear Engineering from Columbia University and is certified by the American Board of Health Physics. He is a member of the American Nuclear Society and the Health Physics Society.

JOHN NEAVE

Education:	BS in Civil/Environmental Engineering, Virginia Tech Post-grad coursework in environmental compliance, waste management, and program management.
Current Position:	Team Leader, AL/OK team, Office of Waste Mangement, (EM-34), Environmental Management Program, DOE-HQ.
Previous Experience:	Over ten years experience with U.S. Department of Defense in systems research, development, and acquisition, including 5 years as project engineer and test officer. Five years experience with U.S. Department of Energy in radioactive and hazardous waste management, including environmental compliance oversight. Previous team leader for the INEL ICPP Calciner DNFSB 90-2 team, which developed EM's first Requirements Identification Document (SRID); similar to the N&S process.

EXPERIENCE and QUALIFICATIONS SUMMARY:
Ferdinand LoRay (Ray) Schwartz.

EXPERIENCE SUMMARY:
Twenty-three years experience in the nuclear power industry with management and engineering responsibilities for numerous unusual and one-of-a-kind projects and activities. This broad technical background includes both commercial and government responsibilities in:

- Management of R&D and Technology Transfer
- Lead licensing, reactor core evaluation, and test engineering
- Supervision of plant startup, test, operations, and quality assurance work.
- Consultant to management on plant operation, safety, and construction modifications.

CURRENT POSITION:
Nuclear/General engineer - Office of Environment, Safety and Health Technical Support within the Office of Energy Research, US Department of Energy, Washington, DC 20585.

Lead responsibility for defining and advising on ER programs for Facility Safety Analysis Reports (SARs), Conduct of Operations (CO), Nuclear Safety Rule implementation, and Lessons Learned (LL). Participated in headquarters and field office led management evaluations of multipurpose research laboratories. Set up and led workshops on current DOE issues regarding SARs, Rules, CO, and LL. Represent ER as part of various groups working to develop policy on current issues and activities within the DOE such as: Nuclear Safety Rules and their enforcement, natural phenomena hazards, necessary and sufficient safety requirements, fusion technology, various DOE orders and standards (including SAR, TSR, nuclear criticality, NPH, CO).

PREVIOUS PROJECTS:

- Three Mile Island (EPRI Site Representative - technology transfer role, e.g. decontamination, robotics, radiation detection).
- Clinch River Breeder Reactor (Licensing Area).
- Beaver Valley Nuclear Power Station (Licensing, Engineering).
- Westinghouse Bettis Laboratory (Safety role and reactor physics test role in refuelings and overhauls of submarines. Worked on reactor core design, procurements, and expended core examinations).
- Military: Worked on developmental weapons at Field Artillery School.
- Served in Vietnam - Battery Commander, Liaison Officer.

EDUCATION:

- US Military Academy, West Point, NY, B.S. Degree 1967.
- George Washington University, Washington DC, Engineering Management Graduate Program enrollment (18 credits to date).

Other Professional Qualifications and Training:

- Member of American Nuclear Society, includes local ANS.
- Professional Engineer (Pennsylvania).

- Westinghouse Bettis Nuclear Power School - 1974 Idaho National Engineerin Laboratory, Idaho Falls, Idaho
- Qualified Reactor Plant Test Engineer (1974-1980) Westinghouse Bettis Atomic Power Laboratory, Pittsburgh, Pennsylvania
- Qualified Reactor Startup and Physics Acceptance Test Engineer (1978-1980)

DOE Courses and Training Completed:

- MORT Based Root Cause Analysis
- Personnel Management Supervision
- Cost and Schedule Control Systems Criteria
- Conduct of Operations, Readiness Review, Management Assessment Training, Safety Analysis Reports and Technical Safety Requirements Preparation

PUBLICATIONS:

1. F.L. Schwartz. Robotics Program Development: Applicable Lessons Learned From TMI-2, EPRI NP-6521. September 1989.
2. F.L. Schwartz, S. Owrutsky. TMI-2 Technology Transfer Progress Report, EPRI NP-5821. May 1988.
3. "TMI-2 Cleanup Techniques Applicable to Decommissioning," F.L. Schwartz, R. D. Meininger. CONF-871018-Vol. 2: Proceedings: 1987 International Decommissioning Symposium, October 1987.
4. "TMI-2 Experience with Remote Operations," F.L. Schwartz, R.D. Meininger CONF-871018-Vol. 2: Proceedings: 1987 International Decommissionin Symposium, October 1987.
5. "Three Mile Island Recovery: Technology Transfer to the Nuclear Power Industry," F.L. Schwartz, D. E. Owen. Technology Transfer Society International Symposium Proceedings 1987, June 1987.
6. F.L. Schwartz. TMI-2 Technology Transfer Progress Report, EPRI NP-4788. September 1986.
7. "TMI-2 Technology Transfer for U.S. Utilities," F.L. Schwartz, W. W. Bixby, J. T. A. Roberts. Proceedings: 1986 Joint ASME/ANS Nuclear Power Conference, July 1986.

1996

Resume

Name: Leonard R. Smith

Current Positions: Radiation Protection Consultant, E. I. DuPont, NEN Products.
10 CFR 20 Issue Manager, E. I. DuPont.
Vice Chairman Council on Radionuclides and Radiopharmaceuticals

Education (each equivalent to MS in USA):

B.Sc. Special Honours, Experimental Physics, 1967, University of Reading, UK.
Advanced Radiation Protection, 1968, Atomic Energy Research Establishment. Post Graduate Education Center, Harwell, UK.
Post Graduate Diploma, Educational Technology, 1976, Plymouth Polytechnic Institute, UK.

Awards & Professional Accreditations:

Over twenty corporate and professional society awards for accomplishments in radiation protection, regulatory analysis, education, marketing and business including:

Graduate of the Institute of Physics, UK, 1968.
Comprehensive Certified Health Physicist, 1986, American Board of Health Physics.
Engineering Excellence Award, 1995, E. I. DuPont.
Environmental Excellence Award, 1995, E. I. DuPont.

Mission:

To promote the safe use of radioactive materials of vital benefit to society while assuring the protection of our environment.

Work Experience:

Total 30 years professional experience including:

23 years in radiation protection R&D, consulting and management.
7 years in environmental surveillance and protection expedition leadership.
4 years director at the Countil of Radionuclides and Radiopharmaceuticals, Inc.

Work Highlights Include:

1. Established radiation protection programs and safety controls for world's first cyclotron (1970) and proton linear accelerator (1979) for commercial radionuclides production.

2. Inventions include methyl iodide air sampling system, tritium contamination frisker (patent issued 1994) and various process monitoring systems and spectrometry applications.

3. Developed new models for internal dosimetry, skin dosimetry for absorbed contamination and radiological assessment in urban environments.

4. Established comprehensive programs for facility decommissioning, radiological emergency response, incident investigation, document control and radiation protection training.

5. Cofounder of the Council on Radionuclides and Radiopharmaceuticals.

6. Serve on over 80 professional societies, national, state and industry working committees addressing radiation protection issues.

Publications:

Over 250 publications and pubic presentations including:

1. "New England Nuclear Corporation's Industrial Health Physics Technologist Certification Program", HPS Mid-Year Symposium, 1979.

2. "Radionuclide Handling Precautions Series, DuPont, NEN Products, 1980-1994.

3. "New England Nuclear Corporation's Program for Reducing Occupational Dose in Commercial Cyclotron Radionuclide Production Operations". HPS Mid-Year Symposium, 1982.

4. "NELRAD Comments on USNRC 10 CFR 61 Proposed Rule Making an Land Disposal of Low Level Radioactive Waste". NELRAD, Boston, 1982.

5. "Human Excretion Patterns Following Occupational Update of ^{3}H-, ^{14}C- and ^{35}S-Labeled Compounds". HP, Vol. 44, No. 3, 1983.

6. "Intake and Subsequent Fate of a Ceramic Particle Containing 2.85 μCi ^{241}Am: A Case Study". HP, Vol. 44, No. 4, 1983.

7. "New England Nuclear Corporation's Comments on USNRC Standards for Protection Against Radiation". Boston, 1983.

8. "DuPont Comments on USNRC Draft Regulatory Guide, Test and Calibration of Radiation Protection Instrumentation". Boston, 1984.

9. "Bioassay Techniques and Strategies" NEC Health Physics Society Workshop, 1985.

10. The DuPont Response Series on Radiation Protection for Research Facilities. Boston, 1985-1993.

11. The DuPont Safety Education Program for Nuclear Medicine Series. Billerica, MA, 1987.

12. "DuPont Comments on USNRC Proposed Rule, Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees". Boston, 1987.

13. U.S. Council on Energy Awareness Radionuclides and Radiopharmaceuticals Committee Position Paper on Regulatory Control of NARM. Washington, DC, 1989.

14. "Radiation Protection Standards and Controls for Particle Accelerators", Massachusetts Department of Public Health Advisory Committee on Accelerator Regulations". Boston, 1989.

15. "U.S. Council on Energy Awareness Radionuclides and Radiopharmaceuticals Committee Comments on U.S. EPA National Emission Standards for Hazardous Air Pollutants; Radionuclides, Subpart I". Washington, DC 1990.

16. "An Evaluation of the Effectiveness of the EPA COMPLY Code to Demonstrate Compliance with Radionuclide Emission Standards at Three Manufacturing Facilities". HPS Mid-Year Symposium, 1990.

17. "Potential Consequences of BEIR V", Tufts University, 1990.

18. "Radiation Protection for Large Industrial Sources", Harvard University, 1990.

19. "Changes in 10 CFR 20" Massachusetts Governor's Advisory Council on Radiation Protection. Boston, 1991.

20. "The Radiation Standard Setting Procedure" Massachusetts Advisory Committee on Emission Standards for Nuclear Power Stations. Boston, 1991.

21. U.S. Council on Energy Awareness Committee on Radionuclides and Radiopharmaceuticals "Position Paper on Skin Contamination Dose Limits". Washington, DC, 1991.

22. "DuPont Comments on the Compatibility of Agreement State's Programs with the U.S. NRC Regulatory Programs". Boston, 1992.

23. "U.S. Council on Energy Awareness Comments on Support of the American College of Nuclear Medicine Petition on Patient Care". Washington, DC, 1992.

24. "U.S. Council on Energy Awareness Comments on the U.S. Nuclear Regulatory Commissions Proposed Method for Regulating Major Materials Licensees, NUREG-1324". Washington, DC, 1992.

25. "Council on Radionuclide and Radiopharmaceuticals Position Paper on Low Level Radioactive Waste". Boston, 1993.

26. "DuPont, DuPont Merck Pharmaceutical Company Comments on U.S. Nuclear Regulatory Commission Draft Radiological Criteria for Decommissioning". Boston, 1994.

27. "Council on Radionuclides and Radiopharmaceuticals Comments on Nuclear Regulatory Commission Proposal for Disposal of Radioactive Material by Release into Sanitary Sewer Systems". Boston, 1994.

28. "Regulatory Update: Radioactive Waste Minimization in the Research Laboratory". Biotech News, Boston, 1994.

29. "DuPont Comments on U.S. Nuclear Regulatory Commission's Enforcement Policy". Boston, 1994.

30. "DuPont Comments on Health Physics Society Internal Dosimetry Programs for Tritium Exposure-Minimum Requirements". Boston, 1994.

31. "Council on Radionuclides and Radiopharmaceuticals Comments on Draft NRC Regulatory Guide DG-8012, Instructions Concerning Risks From Occupational Radiation Exposure". Boston, 1995.

32. "Council on Radionuclides and Radiopharmaceuticals Comments on U.S. Environmental Protection Agency Proposed Federal Radiation Protection Guidance for Exposure of the General Public". Boston, 1995.

33. "Council on Radionuclides and Radiopharmaceuticals Comments to the National Council on Radiation Protection and Measurement on Application of the ALARA Principle". Boston, 1995.

34. "Guidance Needed in Use of Models" Health Physic Society Newsletter special edition on radiation risk models. June, 1995.

35. "Council on Radionuclides and Radiopharmaceuticals Position Paper on the Need for a Federal Radiation Standard Setting Agency". Boston, 1995.

36. "A Manufacturer's Perspective on Low-Level Mixed Waste Treatment, Storage and Disposal", Proceedings of the Third Biennial Symposium on Mixed Waste Baltimore, 1995.

37. "DuPont Comments on the U.S. Nuclear Regulatory Commission's Proposed Constraints for Air Effluents for Licensees Other than Power Reactors". Boston, 1996.

38. "DuPont Comments on the U.S. Nuclear Regulatory Commission's Proposed Reporting Requirements for Unauthorized Use of Licensed Radioactive Material" Boston, 1996.

39. "Council on Radionuclides and Radiopharmaceuticals Comments on the U.S. Environmental Protection Agencies Proposed Hazardous Waste Management System: Identification and Listing of Hazardous Waste: Hazardous Waste Identification Rule." Boston, 1996.

40. "Council on Radionuclides and Radiopharmaceuticals Comments to the National Council on Radiation Protection and Measurement on Operational Radiation Safety Program." Boston, 1996.

SUSAN L. SPENCER
DIRECTOR
OFFICE OF ENVIRONMENT, HEALTH AND SAFETY
UNIVERSITY OF CALIFORNIA, BERKELEY
BERKELEY, CA 94720
(510) 643-8965

SUMMARY:

Over fifteen years experience in addressing environmental issues. Direct and lead an integrated environmental, health and safety program. Managed a major Superfund site in California. Conducted research in waste-water and hazardous waste treatment.

EXPERIENCE:

1993-present: **University of California, Berkeley**
Office of Environment, Health and Safety
Director

- Provide innovative and strategic leadership in all activities related to campus compliance with environmental, health and safety legal requirements and in the management of comprehensive health, safety, and environmental protection programs.

- Create an office environment focused on serving the campus community (students, faculty and staff) and preventing pollution, fires and injuries.

1990-1993: **University of California, Berkeley**
Office of Environment, Health and Safety
Associate Director

- Developed, implemented and managed campus compliance with local and State hazardous materials requirements. Activities included working with the ca community and regulators to develop a chemical inventory system which me needs of the campus and the regulators.

- Revised and updated the campus hazardous waste program which result improved compliance, better campus service and less cost.

1988-1990: **Chevron U.S.A. Inc.**
Government Affairs
Representative-Sacramento

- Lobby State Legislators and Regulators on proposed environmental legislatio regulations. Activities included building coalitions of interested parties negotiating compromises.

Susan L. Spencer, Director
Office of Environment, Health and Safety
University of California, Berkeley

EXPERIENCE (continue):

1986-1988: **Chevron U.S.A. Inc.**
Western Region Production
Project Specialist

- Managed a major Superfund site in California.

- Coordinated Western Region's waste minimization program.

1984-1986: **Chevron Corporation**
Health, Environment and Loss Prevention
Environmental Specialist

- Analyzed, prepared comments, and negotiated agreements with State and Federal regulators on hazardous waste and waste-water discharge requirements. Wrote compliance guidelines for new hazardous material legislation including SARA Title III and California hazardous material legislation.

- Chaired the American Petroleum Institute Task Force on Site Remediation. Prepared comments on proposed regulations, developed position papers, and managed consultants. Worked with representatives from the Department of Health Services and the State Water Resources Control Board on the development of their site remediation policies including the "Site Mitigation Decision Tree".

1979-1984: **Chevron Research Company**
Research Engineer

- Process development of waste-water treatment systems, including laboratory bench experiments and pilot plant demonstrations. Characterization of hazardous waste and evaluation of land treatment options for oil bearing wastes.

ACADEMIC AND PROFESSIONAL DISTINCTIONS:

Air and Waste Management Association
American Institute of Chemical Engineers
California Campus Environmental Health and Safety Association
California Conference of Directors of Environmental Health

EDUCATION:

Michigan Technological University
B.S. Chemical Engineering with High Honor

Ara Tahmassian
3202 Benavente Ave
Fremont, Ca 94539-3002
(510) 770 -0713 (h)
(415) 476-5869 (O)

Professional Experience

University of California, San Francisco **1988 -Present**

Acting Director, Environmental Health and Safety
September 1993 - Present

Responsible for the restructuring and operation of a broad scope Environmental Health and Safety program for a major University with three Medical Centers. The functions include management of 50 FTEs and annual budget of approximately $5,000,000.00. The technical aspects of the Program includes all elements of radiological, biological, chemical, physical, fire, asbestos safety. The Program is developed and operated in accordance with Federal State of California and Local County Regulatory requirements as well as those of the Joint Commission for the Accreditation of Health Care Organizations.

Included are review of regulations and determination of their applicability, development of procedures for implementation, consolidated audit programs, preparation of environmental data for environmental impact reviews (EIR), collaboration in the programs related to California Environmental Quality Act (CEQA) for new and modification of existing facilities, development of mitigation measures, comprehensive air monitoring programs for personnel and environmental sampling, compilation and submission of chemical inventories, management of a 24 hour emergency response program.
The administrative responsibilities include development of annual budget, negotiation of financial agreements for EH&S services, development of recharge rates, establishment of financial tracking systems, design and implementation of a comprehensive computerized record keeping system (financial and technical), management of the staff.

Radiation Safety Officer & Program Manager
January 1988 - September 1993

As the Radiation Safety Program Manger Environmental Health and Safety, develop, manage and direct and comprehensive Radiation Safety Program for a major University with three Medical Centers and a comprehensive Bio-Medical Research Program.

The responsibilities include compliance with the terms of UCSF's Type a Broad Scope Radioactive Materials License, Radiation Producing Machine Registration and various Federal and Sate Regulatory requirements. The Program consists of approximately 300 internal authorizations covering the uses of radioactive materials in 800 laboratories by approximately 2,500 individuals.

Veterans Administration Medical Center,

Clement Street,
San Francisco, CA 91421 1984 - 1987

As the Radiation Safety Office and the Chief of Environmental Health and Safety Section I was responsible for the operation the health and safety program for a major Medical and Biomedical research center. The overall duties were similar to those above.

Allied Technology Group,
National Safety Consultants Division **1982 - 1984 &**
3500 Yale Way, Fremont, CA 94538 **1987 - 1988**

As the Vice President of Operation, developed, managed and operated a major consulting program in areas of radiation safety, asbestos safety, site mitigation and general environmental assessment for a variety of national and international clients.

National Radiological Protection Board
Chilton, Oxon
England **1980 - 1981**

As a Scientific Officer responsible for general radiological safety and protection activities. NRPB is responsible for oversight of the regulatory requirements governing uses of radioactive materials and sources of radiation throughout the United Kingdom.

Education

Ph.D., Health Physics,University of London (Queen Mary College) / Columbia Pacific University [External Student], San Rafael, California
MSc., Radiological Health and Safety, Salford University, Salford (UK)
Council for National Academic Awards, Post Graduate Diploma, Heat Exchanger Design and Technology, Middlessex Polytechnic, Middlessex (UK)
BSc., Nuclear Engineering, London University, Queen Mary College (UK)

Certifications

Diplomate of American Board of Sciences in Nuclear Medicine
EPA, Supervisory Certificate in Asbestos Abatement
State of Indiana Certified Health Physicist (#192)
State of California Qualified Mammography Equipment QA Expert (#MQA-0060)

Other Courses Attended

CDC Certificate- Epidemiology and Prevention of Vaccine-Preventable Diseases (August 1995)
Completed WACUBO's Executive Leadership & Management Institute held at Stanford University (July 1991)
Post Graduate Radiological Protection Course, sponsored by NRPB and Atomic Energy Research Establishment, UK (April-May 1980)
Industrial Hygiene, Engineering Training Center, Veterans Administration, Little Rock, Ak (1986)

Membership

N. Calif. Health Physics Society (1982-)
The Society of Nuclear Medicine (1983-)
American Public Health Association (1982-)

Other Information

Faculty, Occupational and Environmental Medicine, University of California, San Francisco
Developing an Environmental Research and Management Center under the auspices of American University of Armenia (An Affiliate of University of California) in Yerevan, Armenia.
Recipient of Superior Performance Award (1995) and Directors Commendation (1997), VA Medical Center, San Francisco.

Publications

Environmental Health & Safety Compliance, A practical guide for Health Care, Medical & Laboratory Facilities, California health Care Association, (1996), Advisory Board Member.

Occupational Health and Safety, National Safety Council, Edited by Joseph LaDou, M.D., 2nd Edition, 1994, Chapter on Radiation Safety.

Jill Eveloff, Howard Tisdale and Ara Tahmassian,Vagaries of Wipe Testing Data, Liquid Scintillation Counting and Organic Scintillators, Lewis Publishers, Inc., 1991, Edited by Ross, Noakes and Spaulding.

Ara Tahmassian, Jill Eveloff and Howard Tisdale, Liquid Scintillation Waste, Liquid Scintillation Counting and Organic Scintillators, Lewis Publishers, Inc., 1991, Edited by Ross, Noakes and Spaulding.

Roger Sit, Ara Tahmassian,Carl Sorneson, Atmospheric Emissions of Volatile I-1125 from Research Activities, Conference on Environmental Issues and Public policy, Las Vegas, Nevada, 1990.

NAME:
Christopher Nohrden

EDUCATION:
University of California, Berkeley, M.P.H., 1977
University of California, Davis, B.S., 1972

CERTIFICATIONS:
Certified Industrial Hygienist, American Board of Industrial Hygiene
Certified Safety Professional, Am. Board of Certified Safety Profess.

CURRENT POSITION:
Advisory Industrial Hygienist
IBM Storage Systems Division
San Jose, California, 1993 - present

PREVIOUS PROFESSIONAL EXPERIENCE:
Program Manager of Health and Safety
IBM Latin America Headquarters
N. Tarrytown, New York - 1988 - 1993

Program Manager of Industrial Hygiene and Safety
IBM Asia Pacific Headquarters
Tokyo, Japan, 1986-1988

Manager of Industrial Hygiene and Safety
IBM Thomas J. Watson Research Center
Yorktown Heights, New York, 1983-1986

Staff Industrial Hygienist
IBM General Products Division
San Jose, California, 1979-1983

Health and Safety Engineer
Rockwell International
Anaheim, California, 1977-1979

CURRICULUM VITAE

Name:	John E. Scott
Education:	U.S. Naval Academy, BS Aerospace Engineering
Certification:	Certified Safety Professional (Comprehensive Practice)
Current Position:	Industrial Safety Engineer (Electrical Safety) TSPD Division, Hazards Control Department Lawrence Livermore National Laboratory
Experience:	1992-1995: LLNL ES&H Team Industrial Safety Engineer 1971-1991: U.S. Navy, Commanding Officer, Executive Officer, Safety Manager, Nuclear Safety Officer, NAVOSH Audit Team Leader.

v. Technical and Process Experts

Ken Barat
Laser Safety Officer, Nonionizing Radiaotion Safety Officer at Lawrence Berkeley National Laboratory
Laser and Nonionizing credentials:

- Elected Fellow of Laser Institute of America[LIA]
- Member of ANSI Z136.5 Educational Standard sub committee
- Member International T-28 Laser Light Show Standard committee
- Developed, and implemented Arizona Radiation Regulatory Agency Nonionizing Radiation program, chapter 14 title 12 AZ Admin. code.
- ICALEO 1993 medical laser safety panel member
- Published in Journal of Laser Applications (1990, 94, 96)
- Member of LIA Safety Committee
- Contributing editor on LIA Eye Wear Selection Guide
- Co-developer and instructor of LIA Applied Laser Safety Course
- Elected to LIA board of Directors, second 3 year term
- Founder and chairman of DOE Laser Safety Working Group
- Founder of Bay Area Laser Safety Officers organization
- Presented Laser papers at:

  1st International Conference on Laser Safety (invited speaker)

  CRCPD (Conference of Radiation Control Program Directors) Annual meeting

  DOE (Dept. of Energy) Occupational Safety Conference 3rd annual

  SPIE, Jan. meeting 1992 & 1993

  ICALEO 93, 95
- Servied on CRCPD Laser Inspection Task Force
- Served on and now advisor to CRCPD committee on Suggested State Regulations NIR
- Instructor on laser safety for:
  - SPIE,
  - OPTCON
  - HPS
  - LIA
  - Motorola University
  - Hewlett Packard
- Co-chairman Laser certification committee
- Chairman & speaker at first LBL NIR Semiar
- Laser Safety Consultant
- Member ANSI C95.1 RF committee

BIOGRAPHICAL SKETCHES

NAME	POSITION TITLE
Don Bell	Leader, General Science and Operations Support Group Lawrence Berkeley National Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of Richmond, Virginia	BA	1969	Psychology

PROFESSIONAL CREDENTIALS:

None

PROFESSIONAL EXPERIENCE:

1992 - Present Lawrence Berkeley National Laboratory
Manage a wide variety of worker health and safety compliance and emergency preparedness programs for the Laboratory.

1990 - 1992 Contra Costa County Office of Emergency Services
Managed the county radiological protection program.

NAME	POSITION TITLE
Steven Black	Environmental Engineer US Department of Energy, Oakland Operations Office

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
Washington State University	BS	1982	Chemical Engineering

PROFESSIONAL CREDENTIALS:

Certificate in Environmental Auditing (in progress), University of California, Davis

PROFESSIONAL EXPERIENCE:

1991 - Present — US Department of Energy, Oakland Operations Office
Provide water quality oversight and technical support to projects involving discharges to surface water, ground water and sanitary sewers and coordinate preparation of Site Environmental Reports.

1989 - 1991 — Alton Geoscience
Provide environmental engineering consulting services on soil and groundwater remediation projects, including project management, sampling, report writing, obtaining regulatory permits, and budget estimation and tracking.

1982 - 1989 — Mare Island Naval Shipyard
Provided technical support for implementing radiological control and monitoring systems.

NAME	POSITION TITLE
Susan Fields	Project Manager, Environmental Restoration Division US Department of Energy

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
Purdue University	BSCE	1983	Environmental Engineering

PROFESSIONAL CREDENTIALS:

Registered Engineer-In-Training, State of Indiana, 1983

PROFESSIONAL EXPERIENCE:

1994 - Present — US Department of Energy, Oakland Operations Office
DOE Environmental Restoration Project Manager for the Stanford Linear Accelerat
Center, Lawrence Berkeley National Laboratory and the Laboratory for Energy-R
Health Research.

1992 - 1994 — Provost & Pritchard, Inc.
Designed and managed construction of subsurface drainage and erosion control systems throughout Napa and Sonoma Counties.

1983 -1989 — US Environmental Protection Agency.
Provided technical support and oversight of investigation and cleanup activities at environmental emergencies and hazardous waste sites .

NAME	POSITION TITLE
Robert Fox	Environmental Protection Specialist Lawrence Berkeley National Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of California, Berkeley	BA	1983	Chemistry

PROFESSIONAL CREDENTIALS:

Certificate in Hazardous Materials Management, University of California Extension, Berkeley 1994

PROFESSIONAL EXPERIENCE:

1993 - Present — Lawrence Berkeley National Laboratory, EH&S Professional
Develop and implement environmental protection compliance programs for manageme of hazardous materials in above ground tanks and for the treatement of hazardous wastes.

1989 - 1993 — Thermo Analytical, Program Manager
Manage projects for organic, inorganic, radiochemical, mixed waste, industrial hygie and air source testing.

1988 -1989 — Curtis & Tomkins, Organic Chemist
Analyze soil and water samples for volatile organic compounds. Analyze environmental and waste samples.

1986 -1988 — Liquid Carbonic Specialty Gas, Operations Manager.
Responsible for daily operations of production and distribution of high purity gases a for all facility EH&S issues.

NAME	POSITION TITLE
Trang Ha	Environmental Engineer US Department of Energy

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
San Jose State University	BSIE	1984	Industrial Engineering

PROFESSIONAL CREDENTIALS:

Engineer-In-Training, State of California, 1984

PROFESSIONAL EXPERIENCE:

1992 - present — US Department of Energy, Oakland Operations Office, Environmetal Engineer
Provide technical support in UST management and environmental restoration areas.

1991- 1992 — US Navy, Western Division Engineering Field Command, Environmental Engineer
Project manager for restoration projects at Treasure Island and the Navy Alameda Scrapyard

1989 - 1991 — US Navy, Western Division Engineering Field Command, Environmental Engineer
Provided technical support in the air quality management and underground storage tank management areas to various Navy bases in the Bay Area. Also served as project manager for several air compliance upgrade projects and UST removal/cleanup projects.

1985 - 1989 — US Navy, Western Division Engineering Field Command, Industrial Engineer
Provided technical support to public works department at various Navy bases in the western United States.

NAME	POSITION TITLE
Carol Kielusiak	NEPA/CEQA Program Manager Lawrence Berkeley National Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
California State University, Sacramento	MA	1982	Anthropology
San Diego State University	BA	1974	Anthropology

PROFESSIONAL CREDENTIALS:

None

PROFESSIONAL EXPERIENCE:

1992 - Present — Lawrence Berkeley National Laboratory
Managed preparation of Environmental Impact Statements and Reports, Environment: Assessments, Initial Studies and Mitigation Monitoring Plans with respect to the NEPA/CEQA.

1985 - 1993 — TENERA, L.P., Senior Environmental Analyst
Broad array of efforts related to regulatory compliance, particularly as related to hazardous wastes and hazardous materials.

NAME	POSITION TITLE
Ginny Lackner	Manager, Water Quality Protection Programs Lawrence Berkeley National Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of California, Berkeley	MPH	1975	Industrial Hygiene
University of California, Davis	BS	1973	Biological Sciences

PROFESSIONAL CREDENTIALS:

- Certified Hazardous Materials Manager, Academy of Certified Hazardous Materials management, No. 5310
- Registered Environmental Assessor, California, No. 02028

PROFESSIONAL EXPERIENCE:

1993 - Present Lawrence Berkeley National Laboratory
Manage a wide variety of environmental compliance and monitoring programs for the Laboratory.

1985 - 1993 TENERA, L.P., Senior Environmental Analyst
Broad array of efforts related to regulatory compliance, particularly as related to hazardous wastes and hazardous materials.

NAME	POSITION TITLE
Steven Lasell	Nuclear Engineer US Department of Energy

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
Iowa State University	BS	1983	Industrial Engineering

PROFESSIONAL CREDENTIALS:

Certificate in Environmental Management and Auditing, University of California, Davis

PROFESSIONAL EXPERIENCE:

1991 - Present US Department of Energy, Oakland Operations Office
Provide environmental radiation protection oversight and technical support to environmental projects and contracts associated with DOE research and development projects.

1984 - 1991 Mare Island Naval Shipyard
Review and oversight of all aspects of radiological controls associated with the overhaul and refueling of nuclear submarines.

NAME	POSITION TITLE
Ron Pauer	Leader, Environmental Protection Group Lawrence Berkeley National Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of California, Berkeley	MPH	1975	Industrial Hygiene
University of California, Davis	BS	1973	Biological Sciences

PROFESSIONAL CREDENTIALS:

Certified Industrial Hygienist, American Board of Industrial Hygiene, No. 4993

PROFESSIONAL EXPERIENCE:

1975 - Present Lawrence Berkeley National Laboratory
Manage a wide variety of environmental compliance and monitoring programs for the Laboratory.

NAME	POSITION TITLE
Nancy Shepard	Environmental Counsel Lawrence Berkeley National Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of California, Los Angeles, School of Law	JD	1984	Law
Yale University	BS	1980	Psychobiology

PROFESSIONAL CREDENTIALS:

State Bar of California, Environmental Law Section, No. 116327,

PROFESSIONAL EXPERIENCE:

1992 - Present Lawrence Berkeley National Laboratory
Provide legal advise and assistance to Berkeley Lab management and staff on environmental, health, and safety issues.

1989 -1992 Landels, Ripley and Diamond, Associate and Partner, Environmental Department
Advise business, industry, and municipal redevelopment agencies on compliance witl federal and state laws.

1987 -1988 Schnader, Harrison, Segal-Lewis, Litigation Associate
Commercial and environmental litigation practice.

NAME	POSITION TITLE
Charles Smith	Environmental Protection Specialist Lawrence Berkeley National Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
Vista College, Berkeley	AS	1985	Solid and Hazardous Waste Management
University of California, Davis	BA	1984	Biological Sciences
Los Medanos College, Pittsburg	AS	1976	Biological Sciences

PROFESSIONAL CREDENTIALS:

Certified Hazardous Materials Manager, Master Level, Institute of Hazardous Materials Manager, No. 608, 1995

PROFESSIONAL EXPERIENCE:

1980 - Present Lawrence Berkeley National Laboratory, EH&S Professional
Develop and implement environmental compliance programs for regulatory issues wi respect to air quality protection, water quality protection, toxic materails, and hazardo waste.

NAME	POSITION TITLE
Stan Terusaki	Environmental Analyst Lawrence Livermore National Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of California, Los Angeles	BS	1981	Geological Sciences

PROFESSIONAL CREDENTIALS:

None.

PROFESSIONAL EXPERIENCE:

1991 - Present — Lawrence Livermore National Laboratory, Environmental Analyst
Develop and implement environmental protection compliance programs for the management of hazardous, low level and mixed low level wastes and for the use of polychlorinated biphenyls. In addition, lead the environmental subteam for the LLNI Necessary and Sufficient Pilot Project for radioactive wastes.

1990 -1991 — United States Pipe and Foundry Company, Environmental Engineer
Managed all environmental compliance activities of the facility.

1987 -1990 — Waste Management of North America
Performed field technician duties and provided technical support for permit and complaince activities.

NAME	POSITION TITLE
Henry Tran	Environmental Protection Health Physicist Lawrence Berkeley National Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of California, Berkeley	MS	1986	Nuclear Engineering
University of California, Berkeley	BS	1985	Nuclear Engineering

PROFESSIONAL CREDENTIALS:

- Certified NESHAPs Inspections and Stack Sampling, 1994
- Certified Neutron Therapy Medicine Surveys, State of California

PROFESSIONAL EXPERIENCE:

1993 - Present — Lawrence Berkeley National Laboratory, Environmental Protection Health Physicist
Develop and implement radiological NESHAP compliance program, perform radiological dose assessments, and oversee environmental monitoring activities.

1991 -1993 — Stanford Linear Accelerator Center, Environmental Health Physicist
Develop and implement radiological NESHAP compliance program, perform radiochemical analysis and accelerator surveys, oversee environmental monitoring activities.

1989 -1991 — University of California, San Francisco, EH&S Health Physicist
Develop and implement radiation worker safety control and radiological NESHAP compliance programs.

1988 -1989 — Bechtel National Inc., Nuclear Engineer
Provide project support regarding radiation shielding design and criticality safety analysis..

NAME	POSITION TITLE
V. David Tudor	Hazard Assessment Program Manager Lawrence Berkeley National Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of Washington, Seattle	M. Arch.	1976	Architecture
University of Colorado, Boulder	B.A.	1961	Social Science

PROFESSIONAL CREDENTIALS:

- Certificate in Hazardous Materials Management, 1992
- Registered Architect, State of California, Certificate No. 10213, 1979

PROFESSIONAL EXPERIENCE:

1992 - present	Lawrence Berkeley National Laboratory, Hazard Assessment Program Manager
1989 - 1992	Lawrence Berkeley National Laboratory, Management of Design and Construction of Research Facilities.
1976 - 1989	Professional design of facilities containing hazardous materials in private industry.

NAME	POSITION TITLE
Tim Wan	Waste Management Compliance Specialist Lawrence Berkeley National Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of California, Hastings College of the Law	JD	1986	Law
University of California, Berkeley	BA	1976	Biophysics

PROFESSIONAL CREDENTIALS:

- Certified Hazardous Materials Manager, Academy of Certified Hazardous Materials Management, No 5053.
- Registered Environmental Assessor, California, No 05718
- State Bar of California, No 139747

PROFESSIONAL EXPERIENCE:

1992 - Present Lawrence Berkeley National Laboratory, EH&S Professional
Analyze legislation and regulations on hazardous waste.

1988 - 1992 University of California, Santa Cruz, Hazardous Waste Management Program Manag
Designed and implemented a comprehensive hazardous waste disposal program.

1987 - 1988 Training Institute, Fort Ord, Hazardous Waste Handling Course Director
Taught classes on hazardous waste laws and regulations.

HARVEY D. GRASSO

BS Chemical Engineering, UC Davis
Health and Safety Masters Program 9/81-4/83, Univ. of Wash

Certified Industrial Hygienist, American Board of Industrial Hygiene

US. DOE (6/92-Present), Industrial Hygienist:
Past Chair, DOE Industrial Hygiene Coordinating Committee
OAK Representative, DOE Chemical Safety Management Working Group
Trained Accident Investigator (MORT system)
Process Safety Management Training
Q Clearance

US. Navy (10/90-6/92), Industrial Hygienist

URS Consultants (10/89-10/90), Health & Safety Manager

US. Navy (7/74-11/89), Industrial Hygienist

ROBERT KONG

B.S. Mechanical Engineering
Enrolled in Certificate Program for Hazardous Materials Management at UCB

DOE/OAK Waste Management Division, Assistant Program Manager for Waste Management Operations at Lawrence Berkeley National Laboratory. Responsibilities include oversight of Waste Management operations at LBNL; monthly safety walk-throughs; monitoring technical, schedule, and funding baselines; and support for Lead Program Manager.

Other DOE and other experience
WMD Representative at 1995 ES&H Pilot Appraisal for Radioactive Waste Operations at LBNL.
Assistant Program Manager for Waste Management Operations at Stanford Linear Accelerator Center (SLAC).
Contracting Officer's Technical Representative (COR) for subcontract at SLAC.
Baseline Manager for OAK/WMD.

Previously:
Naval Weapons Station, Concord: Eight years, project leader for RMA analyses on U.S. Navy surface combatants.
Pacific Gas & Electric Company: Two years summer internship, energy management representative.

BIOGRAPHICAL SKETCH

NAME	POSITION TITLE
Anthony W. Yuen, P.E.	Fire Protection Engineer - Technical Lead Lawrence Berkeley National Laboratory

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of California, Berkeley	BS	1981	Mechanical Engineering with course work in Fire Protection Engineering

PROFESSIONAL CREDENTIALS:

Registered Fire Protection Engineer, State of California, Certificate No. FP1234
Registered Mechanical Engineer, State of California, Certificate No. M26420

PROFESSIONAL EXPERIENCE:

06/90-present **Lawrence Berkeley National Laboratory,**
Lead Fire Protection Engineer (EH&S): Responsible for the development, implementation and maintenance of the Laboratory-wide Fire Protection Program.

Fire Protection Engineer (Facilities Department): Responsible for Laboratory-wide buildings and facilities are designed and constructed to meet the fire and life safety requirements as prescribed in the applicable codes and standards.

04/88-6/90 **FPC Sierra, Inc.,**
Senior Fire Protection Engineer: Responsible for business development, engineering and conducting fire and life safety surveys of high-rise buildings, hotels, petro-chemical facilities, public utility facilities, industrial facilities, and residential townhouses/condominiums.

03/80 - 03/88 **Bechtel Inc.,**
Loss Prevention Engineer: Responsible for detail design and procurement of fire protection and safety equipment for offshore drilling and production platforms.

PROFESSIONAL AFFILIATIONS:

Member of Society of Fire Protection Association (SFPE)
Member of Northern California and Nevada Chapter of SFPE
Member of National Fire Protection Association (NFPA)

SPECIAL TRAINING AND SKILL:

Hazardous Materials First Responder Certificate (CSTI)
Advanced Fire Protection Engineering Seminar (Factory Mutual)
Advanced Fire Protection Products (3M)
Trained as an auxiliary fire fighter

Narrative IFA Reports

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Environment, Safety, and Health

INTEGRATED HAZARD APPRAISAL

of

BERKELEY LAB

ACCELERATOR AND FUSION RESEARCH DIVISION

August 28, 1996

for
Work Definition and Hazards Identification

ACCELERATOR AND FUSION RESEARCH DIVISION

August 28, 1996

INTRODUCTION

This report initially identifies the work activities and hazards that are present in the E. O. Lawrence Berkeley National Lab (Berkeley Lab or LBNL) Accelerator and Fusion Research Division (AFRD) as part of the Integrated Hazard Assessment (IHA) process. Activities and hazards were identified in preparation for:

Definition of the Necessary and Sufficient (N&S), or Work Smart, set of standards, and Direction of additional future Environmental Health, and Safety (EH&S) integrated functional appraisals.

In late June 1996, a multi-disciplinary team of research and EH&S representatives from Berkeley Lab, Department of Energy (DOE) Oakland Operations, and Lawrence Livermore National Laboratory (LLNL) was identified (note team listing below). Team members and contributors met to review available work activity and hazard information, identify hazards related to activities, field-check findings, and complete identification worksheets. Identification worksheet information was then entered into the IHA information management system and reviewed for quality. Identification worksheets were generally grouped by operations and research areas. Worksheets are available on the Berkeley Lab website.

The body of this report summarizes the IHA team participants, project time-line, AFRD organization and management, ES&H performance expectations and objectives, AFRD actions to be performed, AFRD physical conditions within which the work will be performed, AFRD materials and conditions that could cause adverse consequences, uncertainties about the work, EH&S resource availability and constraints, and stakeholder concerns.

INTEGRATED HAZARD ASSESSMENT TEAM

Participant	Technical Specialty
Ken Barat	LBNL Laser Safety Officer
Cristine Celata	AFRD Deputy Director and Safety Coordinator
Dick Dicely	AFRD ES&H Administrator
Keith Gershon	LBNL Safety Engineer and Team Leader
Harvey Grasso	DOE Industrial Hygiene
Mark Lasartemay	LBNL Waste Management
Steve Leeds	LLNL Fire Prevention
Edwin Njouko	DOE Health Physics
Henry Rutkowski	AFRD Divisional Representative
Pat Thorsen	LBNL Environmental Protection

PROJECT TIME-LINE

Date	Activity
7/24/96	Preview meeting with AFRD program reps. Hazard survey forms distributed.
7/24/96	Establish Team Members
8/5/96	Collect and Review Information
8/6/96	Hazards Identification & Grouping
8/14/96	Field-Check Hazards Identification, Bldgs 58, 16
8/20/96	Field-Check Hazards Identification, Bldgs 6, 71
8/22/96	Completion and Data Entry of Worksheets
8/28/96	Summary Report Draft

ORGANIZATION AND MANAGEMENT

In order to ensure a broad-based employee involvement and an orderly flow of information, the AFRD ES&H program makes use of a committee structure that is organized into three functional levels:

a) The AFRD Environment, Safety and Health Committee
b) The Program Environment, Safety and Health Committees
c) QUEST Teams and/or Supervisor/Employee Safety Circles (SESCs)

Involvement of line management is assured through the appropriate selection of committee chairs and memberships. The AFRD ES&H Committee is chaired by the Division Director, and membership includes all AFRD Program Heads. The active and visible support of all Program Heads is a major factor in the overall success of AFRD's Environment, Safety and Health Program. Each Program-level ES&H Committee is chaired by the Program Head, and a designated Program ES&H Coordinator is included in its membership.

In addition, there is an ES&H Operations Subcommittee, chaired by the Division Deputy, that reports to the parent AFRD ES&H Committee and provides operational oversight of the Division ES&H program. There are also Division Self-Assessment Teams, appointed by the Division Director, that serve as staff to the AFRD ES&H Committee and that play a key role in the Division's Self-Assessment Implementation Plan.

PERFORMANCE EXPECTATIONS AND OBJECTIVES

Research Program Management Responsibility for Safety

Line Management is responsible for the protection of the public, the workers, and the environment.

At the Berkeley Laboratory the following documents establish the policy and provide the implementation guidance that makes line management effectively accountable for protection of workers, the public, and the environment:

Operations Assurance Plan, OAP (1996)
Self Assessment Manual (1992) and Supplement (1996)
Publication 3000, Environment Health and Safety Manual (1995)
Chemical Hygiene and Safety Plan (1992)
Waste Generator Guidelines (1996)
Employee Performance/Progress Review, Section III (1996)

Clear Roles and Responsibilities

Clear and unambiguous lines of authority and responsibility for ensuring safety are established and maintained at all organizational levels within the Division and its contractors.

Each Division making up the Berkeley Laboratory has clearly defined lines of responsibility down to the working level. Each division designates a research investigator to represent its views and concerns on the Laboratory Safety Review Committee and a full time employee to act as the ES&H Coordinator. This Coordinator acts as the interface between ES&H concerns, compliance in the workplace, and the EH&S technical professionals. Organizational information is updated routinely and is retained in the Functional/Facility Notebooks as appropriate (see OAP).

Competence Commensurate with Responsibilities

Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

Job assignments, including hires, are reviewed by line management and by the compensation group within Human Resources to ensure that the requirements and responsibilities of a job are matched by the experience, knowledge, and skills of individuals selected for assignment. Performance expectations for managers and supervisors in the Division match the talents, knowledge, and skills of staff to work assignments and responsibilities.

The Laboratory's training program ensures that each staff member, including participating guests, is adequately trained to participate safely in Laboratory activities. Staff, with supervisor participation, fill out the Jobs Hazards Questionnaire (JHQ) describing the hazards associated with their job assignment and work area. Evaluation of the responses by the Training Coordinator and the cognizant supervisor determines the training regimen needed to carry out work in a manner that protects the employee, co-workers, the public, and the environment.

Balanced Priorities

Resources are effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment is a priority whenever activities are planned and performed.

All environment, safety, and health activities in the Laboratory are described in technical terms with budgetary information included. Each year this information is updated, reviewed and prioritized on the basis of risk to workers, public, and the environment by a Laboratory-wide committee selected to represent programmatic line management and ES&H professionals. This document is utilized by Laboratory Senior Management in strategically planning the immediate focus and long-term goals of the environment, safety, and health program at the Laboratory.

Hazard Controls Tailored to Work Being Performed

Administrative and engineering controls to prevent and mitigate hazards are tailored to the work and associated hazards being performed.

Chapter 6 of the Environment, Health, and Safety Manual clearly defines the steps for each line manager to develop the appropriate engineering and administrative controls to mitigate hazards in the workplace. The Laboratory's Self-Assessment Program, including Functional Appraisals by ES&H professionals, and the UC/DOE Contract 98 Performance Measures provide assurance that implementation of hazards control is adequate to protect the worker, the public, and the environment.

Identification of Safety Standards and Requirements

Before work is performed, the associated hazards are evaluated and an agreed-upon set of safety standards and requirements are established which, if properly implemented, provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.

The Laboratory is dedicated to following the Necessary and Sufficient Closure Process (DOE 450.3) on an iterative basis at all levels of activities in the Laboratory to ensure the Safety Standards are adequate to provide protection to workers, the public, and the environment. This process is completed by commencement of work in those situations where current work is significantly modified, new work is proposed, or substantial facility modifications are being made (Chapter 6, Environment Health and Safety Manual).

Operations Authorization

The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed-upon.

Conditions and requirements for facilities determined to be of higher risk based on the Integrated Hazards Analysis are contained in a Safety Analysis Document. Activity Hazard Documents are the basis for meeting this requirement for specific operations and activities falling into the higher risk category at the Berkeley Laboratory. Internal Agreements describing the performance expectations by each party are used for operations between two functional areas where the quality of performance might adversely impact the Laboratory's ability to meet its responsibility to protect workers, the public, and the environment.

ACTIONS TO BE PERFORMED

AFRD's mission is to study and apply the physics of beams — beams of ions, electrons, and light — and to advance the related technologies. To do this, AFRD works closely with other LBNL organizations, notably the Engineering Division. The resulting ideas and technologies serve users worldwide in fields as diverse as surface science and structural biology. AFRD is divided into six program areas:

Fusion Energy Research. This program furthers the inertial fusion energy option, primarily through R&D on heavy-ion induction accelerators.

Advanced Light Source. This state-of-the-art synchrotron-radiation facility serves to provide intense, laserlike ultraviolet and x-ray beams to scientists in fields as diverse as surface science, structural biology, semiconductor inspection and materials analysis.

Center for Beam Physics. This group applies theoretical and practical capabilities to AFRD's programmatic needs while working on possible future projects.

The PEP-II B Factory. This electron-positron collider, is being built at the Stanford Linear Accelerator Center by a multi-institutional collaboration.

Superconducting Magnets. The complete "melt-to-magnet" capabilities of this program (that is, everything from materials science through magnet design and fabrication) help provide the technical foundations for the next generation of high-energy-physics accelerators.

Ion Beam Technology. This group applies accelerator science and technology to problems as diverse as cancer treatment and the manufacture of next-generation flat-panel displays. Much of the work is done in cooperation with other laboratories and with industry.

PHYSICAL CONDITIONS WITHIN WHICH THE WORK WILL BE PERFORMED

AFRD employees work in a wide range of physical environments, ranging from conventional offices to machine shops to high energy laboratories. Those involved in physical science and technology experimentation tend to have their activities localized. Therefore there is a high degree of familiarity of employees to their specific workplaces.

MATERIALS AND CONDITIONS THAT COULD CAUSE ADVERSE CONSEQUENCES

Most industrial hazards exist in AFRD activities at least to a small extent. The following list comprises the most prevalent conditions which have the potential to be considered hazardous.

1. Corrosives.

The IHA team verified that small amounts of corrosives are used in B 58 and 58A, 80, 10, 2, and 6

2. Flammable gases.

Torch cutting is performed in some shops.
There is a flammable gas storage cabinet in B10.
Hydrogen is used in B16 and 5.
Other flammables are used in B 53, 71A, and 6.

3. Flammable liquids can be found in most AFRD non-office areas.

These are primarily solvents used in cleaning processes, e.g., alcohol, benzene, acetone. B10 has a chemical storage room with flammable liquid storage cabinets.

4. Cryogens.

Liquid nitrogen (LN) is used extensively in AFRD activities. Volume varies, but is most commonly encountered in small dewars. Cryogens are encountered in pipes and tubing assemblies and in cold traps.

5. Toxic Materials.

All laboratories and areas associated with accelerators use toxic chemicals to some extent, although the quantities are generally very small.

Building 71 has an experiment in progress which uses a 5% mixture of Fluorine in Krypton.

6. Laser system.

High powered lasers (Cl 3b, 4) are used in many AFRD operations, and are located in 58, 58a, 2, 5, 71, 6

7. Bridge cranes.

Located in most areas where there are accelerators, and some related areas: 58, 46, 80, 10, 16, 53, 64, 51, 6.

8. Electrical, including high voltage, high current, custom built apparatus, capacitors.

Encountered in most research areas. This is one of the most prevalent conditions in AFRD.

9. Forklifts.

B80, 27, 46, 64, 51, 6, 58.

10. Heat tapes.

Used to heat metal vessels to enhance evacuation. Found in all accelerator processes.

11. Ergonomics/repetitive motion/manual lifting.

This grouping is pervasive in the division, and is the most common potentially hazardous condition. It affects office workers, researchers, and technical support staff.

12. Pressurized cylinders and vessels.

Very common in all AFRD science processes. Found in B 58, 46, 80, 27, 10, 2, 16, 53, 5, 71, 6.

13. RF sources.

Associated with most AFRD science processes. Found in 71, 16, 5, 6, 27.

14. Rotating Equipment.

Found in all shops, and in many of the scientific areas, primarily belt driven pumps.

15. Shop Equipment.

All shops: B 58, 46, 80, 27, 16, 53.

16. Seismic.

All AFRD spaces have tall and/or expensive equipment which is seismically secured.

17. Vacuum equipment.

Vacuum vessels are always used in accelerator areas, and in most AFRD science functions.

18. X-ray, gamma ray.

In high voltage operations, e.g., B58, 53, 71, 6, there is production of incidental X-rays.

19. AHD renewal/ modification.

All major experiments in AFRD are covered by AHD's.

Accelerators and Radiation Sources

Accelerators exist in buildings 6, 5, and 16. The accelerators in 5 and 16 are low energy (<10kV). The entire ALS facility, Bldg. 6, is primarily dedicated to the use of a large accelerator. An electron beam that has been accelerated to 1.5 billion electron volts circulates in the storage ring for several hours, guided and focused by hundreds of precision electromagnets. Undulator and wiggler magnetic "insertion" devices that are also in the ring, produce synchrotron radiation at the soft X-ray and extreme ultraviolet wavelengths.

The radiation produced in an accelerator is characterized as "prompt," that is, the radiation only exists when the machine is actually operating. Employee and guest exposure to radiation is controlled via concrete shielding and redundantly interlocked access controls.

UNCERTAINTIES ABOUT THE WORK

There are no unique uncertainties which will impact hazard identification and selection of applicable and appropriate standards and requirements.

RESOURCE AVAILABILITY AND CONSTRAINTS

No significant changes in AFRD resources devoted to ES&H activities are planned.

STAKEHOLDER CONCERNS

There are no stakeholder concerns unique to AFRD. AFRD has managed, controlled, and permitted (as required) air, water, hazardous, and solid waste streams.

Environment, Safety, and Health

INTEGRATED HAZARD APPRAISAL

of

BERKELEY LAB

CHEMICAL SCIENCES DIVISION

August 23, 1996

for
Work Definition and Hazards Identification

INTRODUCTION

IDENTIFICATION TEAM

Team Member	Technical Specialty
Norm Edelstein	CSD Division Deputy/Chairman, Safety Committee
Jerry Bucher	CSD Research Representative
Linda Maio	CSD Division Safety Administrator
Phil Roebuck	Department of Energy Representative
Dave Tudor	LBNL Team Leader, Safety Analysis
Rick Kelly	LBNL Industrial Hygiene
Harvey Grasso	DOE Industrial Hygiene
Glen Garabedian	LBNL Radiation Assessment

Other ES&H Contributors	Technical Specialty
Steve Lee	LBNL Fire Protection
Pat Thorson	LBNL Environmental Protection
Henry Stauffer	LBNL Health Services
Trang Na	DOE Waste Management
Edwin Njouko	DOE Radiation Assessment

Additional Research Contacts	Building
Harvey Gould	71
Mike Prior	88
Stephen Su	62

PROJECT TIME-LINE

Date	Activity
7/12/96 - 8/9/96	Perform Desktop and Field Check Activities
8/19//96	Summary Report

ORGANIZATION AND MANAGEMENT

CSD EH&S Committee: The committee is managed by Norman Edelstein (Chair, and Division Deputy) and assisted by Linda Maio (Division Safety Administrator). The chair reports directly to the Chemical

Sciences Division Director. Membership includes representatives from each research group. Each investigator appoints a group safety representative, who is the on-site contact person in the LBNL group work areas in matters related to Environmental Health and Safety (EH&S). Group safety representatives are part of the CSD EH&S organization, along with the Division Safety Administrator (Linda Maio) and the Division Safety Coordinator (Norman Edelstein). The representative directs questions for clarification and guidance of a technical nature to the Division Safety Coordinator and, in his absence, to the appropriate contact within the LBNL. EH&S organization. The representative interfaces with the Division and EH&S on behalf of the group and carries out the day-to-day safety program of the group on behalf of the investigator. This person organizes and holds group safety meetings as needed, keeps current the general EH&S files of the group, keeps the investigator and the group members informed of all essential EH&S activities, and is knowledgeable regarding the state of corrective actions. The representative attends the Division Safety Committee meetings.

For purposes of this hazard analysis, the activities of the Division were grouped into the following organizational units

1. Actinide Chemistry
2. Evaluation of chelating ligands for removing uranium/plutonium deposited in bone and kidneys
3. High Energy Atomic Physics
4. Atomic Physics
5. Characterization of the Li-Electyrolyte Interface
6. Superconducting Properties of High Temperature Oxides
7. Chemical Dynamics
8. Catalytic Conversion of C1 Compounds

The Chemical Sciences Division has approximately 190 total employees and guests. Approximately 75% are located on the University of California Berkeley (UCB) campus. Campus activities are located in the following buildings: Hildebrand, Lewis, Latimer, Gilman, Giauque and Birge. Future activities will also be included in Tam Hall. Research activities are also conducted at other locations such as Brookhaven and Stanford.

Principal investigators (PI) report directly to the Division Director (Charles B. Harris) and are accountable for the scientific excellence, relevance to the DOE mission, and fiscal integrity of their programs, as well as adherence to all administrative and regulatory requirements.

PERFORMANCE EXPECTATIONS AND OBJECTIVES

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Competence Commensurate with Responsibilities

Personnel posses the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

Job assignments, including hires, are reviewed by line management and by the compensation group within Human Resources to ensure that the requirements and responsibilities of a job are matched by the experience, knowledge and skills of individuals selected for assignment. A performance expectation for managers and supervisors in the Division of Environment, Health and Safety is how well the talents, knowledge and skills of staff are matched to work assignments and responsibilities

The Laboratory's training program ensures that each staff member, including participating guests, is adequately trained to do participate safely in Laboratory activities. Staff, with supervisor participation, fill out the Jobs Hazards Questionnaire (JHQ) describing the hazards associated with their job assignment and work area. Evaluation of the responses by the Training Coordinator and the cognizant supervisor determines the training regimen needed to carry out work in a manner that protects the employee, co-workers, the public, and the environment.

Balanced Priorities

Resources are effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment is a priority whenever activities are planned and performed.

All environment, safety and health activities in the Laboratory are described in technical terms with budgetary information included. Each year this information is updated, reviewed and prioritized on the basis of risk to workers, public, and the environment by a Laboratory wide committee selected to represent programmatic line management and ES & H professionals. This document is utilized by Laboratory Senior Management in strategically planning the immediate focus and long term goals of the environment, safety and health program at the Laboratory.

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Before work is performed, the associated hazards are evaluated and an agreed-upon set of safety standards and requirements are established which, if properly implemented, provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.

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Operations Authorization

The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed-upon.

Conditions and requirements for facilities determined to be of higher risk based on the Preliminary Hazards Analysis are contained in a Safety Analysis Document. Activity Hazard Documents are the basis for meeting this requirement for specific operations and activities falling into the higher risk category at the Berkeley Laboratory. Internal Agreements describing the performance expectations by each party are used for

operations between two functional areas where the quality of performance might adversely impact the Laboratory's ability to meet its responsibility to protect workers, the public, and the environment.

ACTIONS TO BE PERFORMED

The Chemical Sciences Division conducts basic research in chemical physics and the dynamics of chemical reactions, catalysis, electron spectroscopy, photochemistry, atomic photochemistry, theoretical chemistry, atomic physics, and the chemistry of actinide elements. Its mission is: to continue excellence in research ensured by rigorous peer reviews and the highest caliber scientific staff, to conduct and pursue research which is consistent with the National Energy Strategy, and to engage and instruct the next generation of scientists as a part of the Division's research mission.

1. **Actinide Chemistry:** Development of new technologies for the use, safe handling, storage, and disposal of actinide materials relies on further understanding of basic actinide chemistry and the availability of trained personnel. This research program is a comprehensive, multifaceted approach to actinide chemistry, and to the training of students to address issues in the future. Research efforts include synthetic chemistry to develop new chemical reagents and actinide materials, their chemical and physical elucidation through characterization techniques, and thermodynamic/kinetic studies for evaluation of complex formation. One aspect is the development of complexing agents that specifically sequester actinide ions for the decorporation of actinides in humans and for the separation of actinides in the environment. Extensive studies are underway to prepare organometallic and coordination compounds of the f-block elements showing the differences and similarities among the f-elements and between the f- and d-transition series elements. Optical and magnetic studies on actinides as isolated ions in ionic solids, and in molecules, give information about electronic properties as a function of atomic number. Synchrotron radiation investigations at the Stanford Synchrotron Radiation Laboratory and at the Advanced Light Source provide oxidation state and structural information on actinide material systems of environmental interest.

2. **Evaluation of chelating ligands for removing uranium/plutonium deposited in bone and kidneys.** Research includes the study of the potency of new chelating agents for promoting excretion of internal deposited actinides and related heavy metals.

3. **High Energy Atomic Physics:** The goals of this program are (1) to achieve an understanding of the physics of electron-positron pair production and heavy particle capture from pair production, using theory and experiment and (2) to search for a charge-parity violating permanent electric dipole moment (EDM) of the electron as small as 10-30 e-cm (thousands of times smaller than the present limit). Recent results include the discovery of a new atomic collision process, electron capture from pair production. In this process, an electron-positron pair is produced by the transient electromagnetic field of a relativistic ion-atom collision, and the electron from the pair emerges from the collision bound to the projectile ion. Capture from pair production is predicted to be an important beam loss mechanism at the Relativistic Heavy Ion Collider. Present activities include (1) extending the measurement of electron capture from pair production to 10 GeV/nucleon collision energies and the capture of particles heavier than electrons, (2) performing calculations of capture from pair production using parallel computing, and (3) constructing a new experiment to search for an electron EDM using laser trapping and cooling.

4. **Atomic Physics:** Studies of the structure and interactions of atomic systems are conducted to provide the most detailed description of their behavior and to stimulate theoretical understanding of the observed phenomena. The approach to this work emphasizes research topics that are best addressed with unique tools and expertise available at Lawrence Berkeley Laboratory (LBNL). Currently the program exploits the ability of two state-of-the-art, electron cyclotron resonance (ECR) ion sources at LBNL to produce intense, highly charged beams for the conduct of low-energy ($v < 1.0$ au) ion-atom collision studies. Current emphasis is on multiple electron transfer to bare, one, and two electron ions. This includes measurement of magnetic substrates populated in double electron capture, and the production of low-energy (<20 eV) continuum electrons accompanied by transfer to bound projectile states in collisions with He and more complex targets. Auger electron spectra, and photon spectra from multiply charged ion-atom collisions are used to gain insight into population mechanisms and the structure of highly excited states. The program benefits substantially from collaborative efforts with colleagues from outside LBNL.

5. **Characterization of the Li-Electyrolyte Interface:** A detailed understanding of the reactions that occur between metallic Li and the individual molecular constituents of electrolytes used in Li batteries will be developed. Ultrahigh vacuum (UHV) deposition methods are used to prepare ultraclean Li surfaces of preferred orientation. Molecular films of solvent and/or solute molecules are deposited onto the clean surfaces in UHV at a very low temperature. The reaction between Li and the molecular films is followed using a combination of UHV surface analytical techniques, including Auger electron spectroscopy (AES), secondary ionization mass spectroscopy (SIMS), vacuum UV and X-ray photoelectron spectroscopy (UPES and XPS), and the recently developed variant of XPS termed photoelectron diffraction. The connection between films formed on Li in UHV and films formed at ambient temperature and pressure on Li in liquid electrolyte is made by the use of a common spectroscopy, ellipsometry. Using the fingerprint method, the ellipsometric signatures obtained in UHV for different surface layers having various known structures and compositions are used to identify the structure and composition of the film formed on the Li electrode in liquid electrolyte.

6. **Superconducting Properties of High Temperature Oxides:** Theoretical studies: correlation between structure and properties, electromagnetic and transport properties, doping and non-adiabaticity, vortex structure. Applications are: transmission lines, microwave losses, interface phenomena, and proximity effect.

7. **Chemical Dynamics:** The objectives of this program are to develop the basic knowledge and understanding of the mechanisms and dynamics of elementary chemical reactions that have a major impact on combustion and advanced energy production technologies. Recent emphasis has been to determine the structure and chemical behavior of free radicals, unusual transient species, clusters, and highly-excited polyatomic molecules, and to provide microscopic details of primary dissociation and bimolecular processes. These objectives are achieved with a strongly coupled experimental and theoretical-computational approach, using emerging technologies. Dynamical studies use advanced molecular beam and laser techniques, photofragmentation translational spectroscopy, and ion imaging. Kinetics studies employ IR laser flash kinetic spectroscopy and high-resolution UV-VUV laser spectroscopy. New theoretical methods and models are developed, both to provide insight into chemical reactivity and the dynamics of reactive processes and also to allow one to carry out

forefront calculations to guide and model several of these experimental studies. There are several significant recent advances: lifetime measurements of high-n Rydberg states of NO and Xe reveal the dependence of these lifetimes on collisions and weak electric fields that mix some high-l character with the prepared state. These studies for the first time place the widely used Zero-Electron Kinetic Energy (ZEKE) photoelectron spectroscopy technique on a firm ground. The photodissociation of ozone at 193 nm revealed a range of excited products, and a substantial yield of highly excited ground electronic state O2 was observed, recently suggested to play an important role in the stratospheric ozone budget. Photochemistry of numerous radical systems have been studied using flash pyrolysis and fast beam techniques; these include methoxy, methyl, acetyl, and allyl radicals; the results yield new information on thermochemistry and dissociation dynamics for these important combustion intermediates. Combined theoretical and experimental studies have been used to probe the properties of the transition state in ketene dissociation, providing a strong test of the basic tenets of unimolecular reaction theories. Theoretical methods continue to be advanced, allowing efficient calculation of the rate of a chemical reaction directly and without approximation. Theoretical and experimental approaches have been combined in an investigation of energy transfer processes in collisions of electronically excited hydrogen molecules. New studies in the coming years will take advantage of the Chemical Dynamics Beamline soon to be commissioned at the Advanced Light Source. This beamline will be a national User Facility promising a new era in the study of primary photochemistry, spectroscopy, and reaction dynamics, making use of the intense ultraviolet light provided by the ALS. The Chemical Dynamics Beamline comprises several dedicated molecular beam machines, a specially developed high-intensity laser.

8. **Catalytic Conversion of C1 Compounds:** The purpose of this program is to develop an understanding of the fundamental processes involved in the catalytic conversion of C1 compounds such as CO, CO_2, and CH_4 to fuels and chemicals. The effects of metal oxides on the Fischer-Tropsch activity of metals such as Ru and Rh have been investigated. Electron microscopy together with 1H nuclear magnetic resonance (NMR) reveal that metal oxide promoters decorate the surface of the metal. Cationic vacancies at the perimeter of the oxide islands interact with oxygen atoms in either CO or $H_X CO$ facilitating their further reaction to products. Promoter effectiveness correlates with the Lewis acidity of the cations in the metal oxide. In situ IR studies show that the hydrogenation of CO_2 to methane

proceeds via the dissociation of CO_2 to produce CO. The higher rate of methane formation from CO_2 than CO under identical partial pressures of H_2 and CO_X is attributable to the lower coverage of the catalyst surface by adsorbed CO in the former case. Methane is activated on Ru at low temperatures (623 K) to produce CH_X and C_2H_X species. These species can be polymerized to produce higher molecular weight hydrocarbons or used to alkylate other organic compounds.

PHYSICAL CONDITIONS WITHIN WHICH THE WORK WILL BE PERFORMED

Building 2: One laboratory on the 1st Floor contains experiments supported by the Characterization of the Li-Electrolyte Interface program of CSD. Safety of the laboratory is managed by the Materials Sciences Division and was included in the IHA evaluation of that division. Also, the Chemical Dynamics program occupies space on 3rd Floor. Research activities in the area have stopped and the equipment is being moved to Building 6.

Building 6: The Chemical Dynamics program has research activities on one of the beamlines in the ALS. Safety of the activities is managed by the ALS staff and was included in the IHA evaluation of the ALS.

Building 62: The Superconducting Properties of High Temperature Oxides program occupies office space on the 3rd Floor. All of the research activities are computer analysis and there are no ES&H issues except ergonomics. Also, The Catalytic Conversion of C1 Compounds program occupies space on the 3rd Floor. The program is moving to Tam Hall on the UCB campus. Safety of the program was reviewed in the Material Sciences Division IHA.

Building 70A: The Actinide Chemistry program occupies space on the 1st and 2nd Floors. Also, the Evaluation of Chelating Ligands for Removing Uranium/Plutonium Deposited in Bone and Kidney occupies space on the 2nd Floor.

Building 71: The High Energy Atomic Physics program occupies space in Building 71.

Building 74: The Evaluation of Chelating Ligands for Removing Uranium/Plutonium Deposited in Bone and Kidney program jointly uses one lab on the 3rd floor with the Life Science Division.

Building 88: The Atomic Physics group conducts experiments in Building 88. A Memorandum of Understanding is in place between the Nuclear Science Division and the Chemical Science Division which establishes safety responsibility for research activities with NSD.

UCB Campus activities are located in the following buildings: Hildebrand, Lewis, Latimer, Gilman, Giauque and Birge. Future activities will also be included in Tam Hall. Research activities and hazards in UCB facilities are similar to hazards on the LBNL site. Research activities are also conducted at other locations such as Brookhaven and Stanford. The safety of activities at Brookhaven and Stanford are covered by ES&H requirements of those institutions

MATERIALS AND CONDITIONS THAT COULD CAUSE ADVERSE CONSEQUENCES

General: Most of the laboratories use potentially hazardous chemicals and radionuclides. Several of the laboratories make use of non-ionizing radiation sources, cryogens, lasers and magnetic fields. Biohazardous materials are not used. Small vacuum systems and compressed gases (including toxic gases) are used in several laboratories.

Electrical and Mechanical Hazards: A limited array of electrical and mechanical hazards are present in the CSD. These include high voltage electrical systems, high current electrical systems, repetitive trauma associated with office work, a few small vacuum systems, some pressurized gas systems, belt driven equipment and ovens.

Electrical Hazards

- The overall level of concern associated with high voltage/high current equipment is low.
- High voltage power supplies are also associated with a laser system (Building 70A, Room 1159 and Building 71, Room 117) and two X-ray machines (Rooms 1145 and 1159).

- There are few high amperage systems in CSD. High current is provided to the EPR magnet system in Room 1159, Building 70A. There is also a NMR magnet in 70A-2215.

Pressure and Vacuum Hazards

- The overall level of concern associated with pressure and vacuum systems in CSD is low.
- The main pressure hazards are the compressed gas cylinders, mostly nitrogen, argon and carbon dioxide.
- Toxic gas cylinders are also used (see section on health hazard gases).
- Vacuum systems are present in Building 70A-1165, 71-226 and 71-146R. A glass bell jar with an expanded metal shield is located in 71-146R. A steel vacuum chamber (COW) is located in 71-226.
- There are a few glass vacuum and inert atmosphere systems that are filled from a compressed gas cylinder (Rooms 2217 and 2211 of Building 70A).
- Several vacuum pumps have exposed belt drives.

Ovens

- The overall level of concern associated with the use of ovens in CSD is low.
- A high temperature oven is located in Building 71, Cave R.
- Low temperature (<100 degrees C) ovens are widely used in CSD.

Repetitive Mechanical Trauma

- Office operations include the usual array of ergonomic issues, notably those associated with the use of computers and workstations.

Chemical Hazards: A variety of toxic, flammable, corrosive, reactive or otherwise dangerous chemicals are used in the CSD. In almost all cases, the quantities used at any time are quite small, consistent with typical laboratory operations. Examples of hazardous chemicals in use in CSD are provided below.

Flammable Gases:

- The level of concern relating to the use of flammable gases in CSD is low.
- Flammable gases are used in several labs.
- Flammable gases include hydrogen, deuterium, methane and butylene.

Flammable Liquids:

- The level of concern associated with the use of flammable liquids in CSD is low to moderate overall.
- Flammable liquids are used throughout CSD in small quantities.
- Three rooms were identified as having a moderate level of concern associated with flammable liquids, in all cases because the quantities in storage were unusually large.
- Typical flammable liquids include toluene, THF, diethyl ether, and hexane.

Inert Cryogens:

- The level of concern associated with the use of inert cryogens is low.
- Liquid helium is used in 70A-1151 and 1159 in dewers.

Corrosives:

- The level of concern associated with the use of corrosives in CSD is low overall, with two labs identified as representing a "moderate" level of concern.
- Most of the CSD laboratories store or use small amounts of corrosive materials.
- Common corrosives include lithium hydroxide, glacial acetic acid, nitric acid, and ammonium hydroxide.

Reactives:

- The level of concern associated with the use of reactives in CSD is low overall, with only one lab identified as representing a moderate level of concern.
- Although a large number of reactive chemicals are used, in most cases they are used in only very small quantities.
- Small amounts of reactive chemicals are used in most of the laboratories in CSD.
- Common reactive chemicals include magnesium perchlorate, phosphorous pentachloride, lithium, hydrazine, perchloric acid, and glacial acetic acid.

Reproductive Toxins:

- The overall level of concern associated with the use of reproductive toxins in CSD is low.
- No labs were identified with a level of concern of moderate or high.
- Common reproductive toxins include lead compounds and toluene.

Carcinogens:

- The overall level of concern associated with the use of carcinogens in CSD is low.
- One lab was identified as representing a moderate level of concern with respect to carcinogens (Building 70A, Room 2217).
- Small quantities of organic carcinogens such as methylene chloride, chloroform, benzene, and carbon tetrachloride are used.
- Similarly, small quantities of inorganic carcinogens such as nickel are present.

Pyrophorics:

- The overall level of concern associated with the use of pyrophorics in CSD is low.
- Only very small quantities of pyrophoric materials are present. A variety of powdered, potentially pyrophoric metals are present, including alkali metals.

Toxic Materials:

- The overall level of concern associated with the use of toxic and extremely toxic materials in CSD is low.
- No labs were identified as having a moderate or high level of concern associated with the use or storage of toxic materials.
- Typical highly toxic chemicals include cyanide salts.

Health Hazard Gases:

- The overall level of concern associated with health hazard gases in CSD is low.
- Toxic gases were identified in five laboratories.
- Toxic gases in use include anhydrous ammonia, and trimethyl amine and carbon monoxide.

Oxidizers:

- The overall level of concern associated with the use of oxidizers in CSD is low.
- No laboratories were identified as having a moderate level of concern associated with oxidizers.
- Approximately 1/4 of the laboratories store or use oxidizers.
- Typical oxidizers include potassium permanganate, hydrazine, and nitric acid,

Physical Agents: Physical agents present in CSD include ultraviolet radiation, lasers, magnetic fields and microwave radiation. Each of these is discussed below.

Ultraviolet Radiation

- The overall level of concern associated with the use of ultraviolet radiation in CSD is low.
- No facilities were identified where the level of concern is judged to be moderate.
- Only one lab uses a UV source, and it is an unmodified commercial product.

Radiofrequency/Microwave Radiation

- The overall level of concern associated with the use of radiofrequency/microwave radiation in CSD is low.
- CSD uses several small home-built RF induction heaters.
- There is an RF source associated with the EPR facility in Room 1159, of Building 70A, and with the NMR facility in 2215.

Lasers

- The overall level of concern associated with the use of lasers in CSD is low.
- Two lasers are located in Building 71, Room 117.
- There are a number of lasers in Room 1159 of Building 70A.

Magnetic Fields

- The overall level of concern associated with the use of magnetic fields in CSD is low. Strong DC magnetic fields are present in only two places, Rooms 1151, 1159, and 2215 of Building 70A.

Infectious/Biohazardous Agents: The CSD does not use biohazardous agents.

Accelerators and Radiation: Accelerator activities are conducted offsite at Stanford or Brookhaven except for the Atomic Physics activities at Building 88. Hazard and safety information for Building 88 is covered in the Nuclear Science Division report. Below is a description of activities on the LBNL site with respect to radionuclides.

Actinide Chemistry: Experimental activities with radionuclides include: Stabilization of Radioactive Waste; Magnetic Measurements on Uranium Compounds; Actinide Spectroscopy: measurement of fluorescence or absorption spectra of various actinides; Preparation of Plutonium, Thorium, Neptunium and Curium for various experiments; synthesis and characterization of inorganic and organometalic compounds containing uranium, thorium and group IVA transition metals; Electron Spectroscopy of Actinides (Synchrotron radiation investigation of oxidation state and structural information on actinide material systems of environmental interest).

Evaluation of Chelating Ligands for Removing Uranium/Plutonium deposited in Bone and Kidneys. Experimental activities with radionuclides include studies of the potency of new chelating agents for promoting excretion of internally deposited actinides and related heavy metals, through injection of mice with actinides.

High Energy Atomic Physics: Experimental activities with radionuclides include: laser trapping and cooling of Francium and Cesium and relativistic atom collisions.

UNCERTAINTIES ABOUT THE WORK

There are no unique uncertainties which will impact hazard identification and selection of applicable and appropriate standards and requirements.

RESOURCE AVAILABILITY AND CONSTRAINTS

No significant changes in CSD resources dedicated to ES&H activities are planned.

Representatives of the CSD offered the following evaluation of the EH&S Division past and future resources and support:

- The need for EH&S resources and support for the coming year should be roughly the same as last year, except that laboratories in B70A which are currently being remodeled will be put back in service. Additional monitoring will be required in the next year to support those laboratories.

The following concerns were raised by CSD:

- Additional coverage of monitors for handling radionuclides is needed to improve research activity efficiency. For activities that need monitors, it is difficult to arrange support in a timely manner because of the monitor's workload.

Suggestions for improvements:

- The Job Hazards Questionnaire needs to be further streamlined. Required training should be offered in a variety of forms, in addition to courses (mentoring, videos, etc.), and alternatives should be created to verify competency, such as verifying adequate competency via challenge exams.

STAKEHOLDER CONCERNS

There are no stakeholder concerns unique to CSD. CSD has managed, controlled, and permitted (as required) air, water, hazardous, and solid waste streams.

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Environment, Safety, and Health

INTEGRATED HAZARD APPRAISAL

of

BERKELEY LAB

COMPUTER SCIENCES DIRECTORATE

August 23, 1996

for
Work Definition and Hazards Identification

Computer Sciences

HAZARDS IDENTIFICATION TEAM

Team Member:

Paul Davis	Industrial Hygiene
Keith Gershon	Electrical Safety Engineer
Dick Dicely	Division Safety Coordinator
Paul Johnson	Safety Engineer and Team Leader
David Stevens	Assistant to Division Director
Tony Yuen	Fire Protection
Pat Thorson	Environmental Protection
Phil Roebuck	DOE Site Office

PROJECT TIME LINE

Activity:

Brief Division EH&S Committee	6/28/96
Identify Team Members	6/28/96
Collect & Review Information	7/3/96-7/17/96
Overview of Division	8/2/96
Initial Hazards Identification & Grouping	8/7/96
Field Validation	8/13/96
Finalize Risk Survey Sheets	8/15/96
Summary Report Draft	8/16/96

Organization, Management

The Computing Sciences Directorate consists of two divisions, Information and Computing Sciences (ICSD) and the National Energy Research Scientific Computing Center (NERSC); and three departments, Networking and Telecommunications (ESNet), Center for Computing Sciences and Engineering (CCSE), and Mathematics; that provide resources and activities that support Associate Laboratory Director, C. William McCurdy.

ICSD, headed by Stewart C. Loken, is further divided into three departments, Information Systems and Services (ISS), Technical and Electronic Information (TEID), and Computer Science Research (CSRD). NERSC, under the direction of Horst Simon, is divided into two departments, Future Technologies and High Performance Computing (HPCAC).

The divisions and departments listed above are responsible for the dual mission of the directorate:

1. To pursue computer science research in areas of interest to the Laboratory and DOE.

2. To provide infrastructure and support services for administrative and scientific computing, archiving and record keeping, computer networking, the LBNL libraries, technical and electronic information, telecommunications, and videoconferencing.

The NERSC Facility Manager, Dick Dicely, is charged with oversight of EH&S activities for the entire Directorate. The Facility Manager reports to the Department Head for High Performance Computing who in turn reports to the NERSC Division Director. The EH&S Committee meets once per quarter and provides guidance to the Division Directors and Department Heads with regard to EH&S concerns. The EH&S Committee is composed of representatives from all Departments.

The Computing Sciences Directorate is responsible for operations in the following buildings: 1, 10A, 17A, 46, 50A, 50B, 50C, 50D, 50E, 50F, 69, 70E, 70G, 90, 938, and 965.

PERFORMANCE EXPECTATIONS AND OBJECTIVES

Program Management Responsibility for Safety

Line Management is responsible for the protection of the public, the workers, and the environment.

At the Berkeley Laboratory the following documents establish the policy and provide the implementation guidance that makes line management effectively accountable for protection of the workers, the public and the environment:

- Operations Assurance Plan, OAP 1996
- Self Assessment Manual (1992) and Supplement (1996)
- Publication 3000, Environment Health and Safety Manual (1995)
- Chemical Hygiene and Safety Plan (1992)
- Waste Generator Guidelines (1996)
- Employee Performance/Progress Review, Section III 1996

Clear Roles And Responsibilities

Clear and unambiguous lines of authority and responsibility for ensuring safety are established and maintained at all organizational levels within the Department and its contractor.

Each Division making up the Berkeley Laboratory has clearly defined lines of responsibility down to the working level. Each division designates a research

investigator to represent its views and concerns on the Laboratory Safety Review Committee and a full time employee to act as the EH&S Coordinator. This Coordinator acts as the interface between EH&S concerns and compliance in the workplace and the EH&S technical professionals.

Roles and responsibilites are delineated in organizational/facility notebooks as appropriate (see OAP).

Competence Commensurate With Responsibilities

Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

Job assignments, including hires , are reviewed by line management and by the compensation group within Human Resources to ensure that the requirements and responsibilities of a job are matched by the experience, knowledge and skills of individuals selected for assignment. A performance expectation for managers and supervisors at the Laboratory is how well the talents, knowledge, and skill of their employees are matched to work assignments and responsibilities.

The Laboratory's training program ensures that each staff member, including participating guests, is adequately trained to participate safely in Laboratory activities. Staff, with supervisor participation, fill out the Jobs Hazards Questionnaire (JHQ) deciding the hazards associated with their job assignment and work area. Evaluation of the responses by the Training Coordinator and cognizant supervisor identifies the training necessary to carry out work in a manner that protects the employee, co-workers, the public, and the environment.

Balanced Priorities

Resources are effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment is a priority whenever activities are planned and performed.

All environment, safety and health activities in the Laboratory are described in technical terms with budgetary information included. Each year this information is updated, reviewed and prioritized on the basis of risk to workers, public, and the environment by a Laboratory wide committee selected to represent programmatic line management and EH&S professionals. This document is utilized by Laboratory Senior Management in strategically planning the immediate focus and long term goals of the environment, safety and health program at the Laboratory.

Hazard Controls Tailored to Work Being Performed

Administrative and engineering controls to prevent and mitigate hazards are tailored to the work and associated hazards being performed.

Chapter 6 of the Environment, Health and Safety Manual clearly defines the steps for each line manager to develop the appropriate engineering and administrative controls to mitigate hazards in the workplace. The Laboratory's Self Assessment Program, including Functional Appraisals by ES&H professionals, and the UC/DOE Contract 98 Performance Measures provide assurance that implementation of hazards control is adequate to protect the worker, the public, and the environment.

Identification of Safety Standards and Requirements

Before work is performed, the associated hazards are evaluated and an agreed-upon set of safety standards and requirements are established which, if properly implemented, provide adequate assurance that the public, the workers, and environment are protected from adverse consequences.

The Laboratory is dedicated to following the Necessary and Sufficient Closure Process (DOE 450.3) on an iterative basis at all levels of activities in the Laboratory, to ensure the Safety Standards are adequate to provide protection to workers, the public, and the environment. This process is completed by commencement of work in those situations where current work is significantly modified, new work is proposed, or substantial facility modifications are being made (Chapter 6, Environment, Health and Safety Manual).

Operations Authorizations

The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed-upon.

Conditions and requirements for facilities determined to be of higher risk based on the Preliminary Hazards Analysis are contained in a Safety Analysis Document. Activity Hazard Documents are the basis for meeting this requirement for specific operations and activities falling into the higher risk category at the Berkeley Laboratory. Internal agreements describing the performance expectations by each party are used for operations between two functional areas where the quality of performance might adversely impact the Laboratory's ability to meet its responsibility to protect workers, the public, and the environment.

ACTIONS TO BE PERFORMED

The mission of the Computing Science Directorate is to (1) provide LBNL and the Energy Research community with an integrated facility for computational science supported by powerful intellectual, computing and networking resources, and (2) support the LBNL business and administrative infrastructure with the most modern methods and technology.

PHYSICAL CONDITIONS WITHIN WHICH THE WORK WILL BE PERFORMED

Computer Science Division is primarily located in the 50 complex but also occupies or has rooms in the following buildings: 46, 51, 69, 90, 70E, 17A, 938, 965, 70G.

The types of rooms this Division occupies range from primarily office/computer to a small electrical/machine shop in 50A, to a computer repair shop in building 46.

MATERIAL AND CONDITIONS THAT COULD CAUSE ADVERSE CONSEQUENCES

NERSC Computer Room Underfloor Halon System. This area is located in 50B-1275 and consists of eight cylinders, each containing 255 pounds of halon in a fixed system with three levels of high-sensitivity fail-safe system. (The cylinders themselves are located in 50B-0258.)

Level 1 (lowest sensitivity)
Page Operator, Investigate signal to Fire Dept. Blue flashing strobe 1275 ceiling pulsating horn 1275.

Level 2 (moderate sensitivity, indicates a significant considerations) Fire Alarm Signal to Fire Dept. Yellow flashing strobe 1275 ceiling. Shutdown blowers 25&26 50B (fan room 0243).

Level 3 (highest sensitivity indicates significant quantity of smoke for significant duration) Trip off re-circulating ACU's. Trip EPO-! (1275 panel shunt trips) & EPO-3 (0248-MG substation switch gear trips).

Even if the high-sensitivity system attains Level 3, a second standard detector (heat or smoke) trip is required before the halon release countdown (30 second delay) is activated. Clearly marked manual abort buttons are located at all exits, and by the alarm annunicator panel.

This area is rated low-hazard because of the above description, but could become a moderate-high hazard if system fails being that halon is ozone depleting, There are no known systems failure at this time, Will follow with LLNL, NASA who have utilized this type of system.

Above Floor Halon Systems

These areas are located in Buildings 10A, 50A-1156, 50B-2265, and 62B. These systems contain lesser quantities of halon, ranging from 50 to 70 pounds, with the exception of the system in 50A-1156 which contains 2 cylinders at 294 pounds each.

The system in 50A-1156 requires two detector trips to activate and includes a manual abort button. The systems in 50B-2265 consist of bottles located directly on top of each of the six tape storage silos and also contains manual abort buttons. A release of halon in 50B-2265 would be contained entirely within the affected storage silo.

Network And Telecommunications Battery Banks

There are four locations used to support all the telephones and network for the Laboratory. Locations are Buildings 10, Donner attic, 66 basement of 50 complex between 50A and 50B, (largest unit). This unit is completely enclosed with shielding to preclude inadvertent contact. This area should be identified as "Battery Bank" and "Authorized Personnel Only."

Bldg 50A-1156

Telephone room, switching, and networking. Small battery bank does not have the proper shielding and identification. Two Halon 1301 tanks in the room for fire suppression.

Bldg. 50E-0022 Small battery room in this area should be monitored for adequate ventilation.

Bldg. 50B-0248 NERSC This room contains the halon cylinders which provide underfloor protection in 50B-1275.

Bldg. 50B-2265, Mass Storage Silos. The six silos in this room each contain one cylinder of halon stored on top of the silo.

Bldg 46-132,134

This shop is run by Tom Viola, primary function is maintenance repair of computer and electronic components. Small quantities of Acetone, Isopropyl Alcohol. Location also has 2 Satellite Accumulation Area(SAA). Small quantities of freon and other spray cans containing compounds regulated by BAAQMD.

Bldg 50F Illustration Room

Small quantities Alcohols and Adhesives may be subject BAAQMD permitting and operating regulations, appears to be low-volume use area.

Division Wide

Ergonomic hazards associated with the use of computers are the most common hazard in office areas of the division. Employees are encouraged to have their worksations evaluated and the proper chairs and keyboards accessories purchased.

UNCERTAINTIES ABOUT THE WORK

Present funding and DOE approval levels indicate the ability to continue to aggresively pursue the mission of the Directorate. While anticipated growth of the Directorate may create a shortage of office/computer room space, the types of operations and hazards present today will not change nor will the overall hazard level of Directorate operations increase as a result of this growth.

RESOURCE AVAILABILITY AND CONSTRAINTS

Current indications are that adequate funding will be available to address mission and ES&H concerns in the coming years.

STAKEHOLDER CONCERNS

None identified.

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Environment, Safety, and Health

INTEGRATED HAZARD APPRAISAL

of

BERKELEY LAB

DIRECTORATE/OPERATIONS OFFICES

August 30, 1996

for
Work Definition and Hazards Identification

DIRECTORATE/OPERATIONS OFFICES

August 30, 1996

HAZARDS IDENTIFICATION TEAM

Team Member	Technical Specialty
Paul Davis	Industrial Hygiene and Team Leader
Connie Grondona	Health Services
Irene Kan	Directorate/Operations ES&H Coordinator
Karl Olson	Directorate/Operations
Carl Schwab	Environmental Protection - Site Office
Tony Yuen	Fire Protection

PROJECT TIME-LINE

Activity	Date
Collect and Review Information	8/1/96 - 8/8/96
Establish Team Members	8/9/96
Initial Hazards Identification & Grouping	8/12/96
Field Check Spaces	8/14/96
Finalize Risk Survey Sheets	8/15/96
Summary Report Draft	8/16/96
Final Draft Report	8/30/96

ORGANIZATION AND MANAGEMENT

The Directorate/Operations (Ops) Offices consists of offices of the Laboratory Director, the Deputy Director for Research, the Deputy Director for Operations, the Chief Financial Officer (CFO), and Human Resources. These offices perform management and administrative functions. Unit heads within these offices are responsible for their employees' safety and health. The Directorate/Ops Offices ES&H coordinator (Irene Kan) is charged with oversight pertaining to environment, safety, and health (ES&H) matters. The ES&H Coordinator reports ES&H activities to Karl Olson, Office of Contract Management. An ES&H Committee meets

periodically and provides guidance to the Deputy Directors with regard to ES&H concerns. The ES&H Committee is chaired by the ES&H Coordinator and is composed of representatives from each of the units in the Directorate and Ops offices.

PERFORMANCE EXPECTATIONS AND OBJECTIVES

Research Program Management Responsibility for Safety

Line management is responsible for the protection of the workers and for ensuring that its operations do not impact public health or the environment.

At the Berkeley Laboratory, the following documents establish the policy and provide the implementation guidance that makes line management effectively accountable for protection of workers, the public, and the environment:

Operating and Assurance Plan, Pub-3111 (1996),
Self Assessment Manual, Pub-5344 (1996)
Environment Health and Safety Manual, Pub-3000 (1995)
Chemical Hygiene and Safety Plan, Pub-5341 (1992)
Waste Generator Guidelines, Pub-3092 (1996)
Employee Performance/Progress Review (Section III), RPM Pub-201 (1996)

Clear Roles and Responsibilities

Clear and unambiguous lines of authority and responsibility for ensuring safety are established and maintained at all organizational levels within the Directorate and Operations Offices.

Each division making up the Berkeley Laboratory has clearly defined lines of responsibility down to the working level. Each division designates a research investigator to represent its views and concerns on the Laboratory Safety Review Committee and a full-time employee to act as the ES&H Coordinator. This Coordinator acts as the interface between ES&H concerns and compliance in the workplace and the EH&S technical professionals.

Competence Commensurate with Responsibilities

Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

Job assignments, including hires, are reviewed by line management and by the compensation group within Human Resources to ensure that the requirements and responsibilities of a job are matched by the experience, knowledge and skills of individuals selected for assignment. A performance expectation for managers and supervisors in the Directorate/Ops Offices is how well the talents, knowledge, and skills of staff are matched to work assignments and responsibilities.

The Laboratory's training program ensures that each staff member, including participating guests, is adequately trained to participate safely in Laboratory activities. Staff, with supervisor participation, fill out the Jobs Hazards Questionnaire (JHQ) describing the hazards associated with their job assignment and work area. Evaluation of the responses by the Directorate/Ops

ES&H Coordinator and the cognizant supervisor determines the training regimen needed to carry out work in a manner that protects the employee, co-workers, the public and the environment.

Balanced Priorities

Resources are effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment is a priority whenever activities are planned and performed.

All environment, safety and health activities in the Laboratory are described in technical terms, with budgetary information included. Each year, this information is updated, reviewed and prioritized on the basis of risk to workers, public, and the environment by a Laboratory-wide committee selected to represent programmatic line management and ES&H professionals. This document is utilized by Laboratory Senior Management in strategically planning the immediate focus and long term goals of the environment, safety and health program at the Laboratory.

Hazard Controls Tailored to Work Being Performed

Administrative and engineering controls to prevent and mitigate hazards are tailored to the work and associated hazards being performed.

Chapter 6 of the Environment, Health and Safety Manual clearly defines the steps for each line manager to develop the appropriate engineering and administrative controls to mitigate hazards in the workplace. The Laboratory's ES&H Self-Assessment Program, including Functional Appraisals by ES&H professionals, and the UC/DOE Contract 98 Performance Measures provide assurance that implementation of hazards control is adequate to protect the worker, the public, and the environment.

Identification of Safety Standards and Requirements

Before work is performed, the associated hazards are evaluated and an agreed-upon set of safety standards and requirements are established which, if properly implemented, provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.

The Laboratory is dedicated to following the Necessary and Sufficient Closure Process (DOE 450.3) on an iterative basis at all levels of activities in the Laboratory to ensure that Safety Standards are adequate to provide protection to workers, the public and the environment. This process is completed by reevaluation of work in those situations where current work is significantly modified, new work is proposed, or substantial facility modifications are being made (Chapter 6, Environment Health and Safety Manual).

Operations Authorization

The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed-upon.

Conditions and requirements for facilities determined to be of higher risk, based on the Preliminary Hazards Analysis, are contained in a Safety Analysis Document. Activity Hazard Documents are the basis for meeting this requirement for specific operations and activities

falling into the higher risk category at the Berkeley Laboratory. Internal Agreements, describing the performance expectations by each party, are used for operations between two functional areas where the quality of performance might adversely impact the Laboratory's ability to meet its responsibility to protect workers, the public, and the environment.

ACTIONS TO BE PERFORMED

The primary mission of the Directorate/Operations Offices is to manage Berkeley Laboratory.

PHYSICAL CONDITIONS WITHIN WHICH THE WORK WILL BE PERFORMED

The Directorate/Operations Offices is primarily office-oriented; although there are visiting students that participate in programs sponsored by the Center for Science and Engineering (CSEE). Management and Administrative personnel occupy the following buildings: 65, 65A, 65B and 936. In addition to these buildings, rooms are occupied in Buildings 7, 50, 50A, 51, 69, 70A, 90, 90B, and 938. CSEE sponsored students may work in any of the buildings at LBNL.

MATERIALS AND CONDITIONS THAT COULD CAUSE ADVERSE CONSEQUENCES

Ergonomic hazards associated with the use of computers are the primary occupational hazard for management and administrative personnel. There is a pro-active workstation evaluation program which developed an evaluation form and a computer database for recordkeeping. During the upcoming year most workstations in this division will be evaluated.

CSEE sponsored students may be potentially exposed to chemical, biological, and physical hazards. The CSEE safety policy is for mentors to evaluate hazards with the student before work begins in the laboratory, as well as to provide formal classroom and on-the-job training. Mentor supervision is an important means for ensuring a safe work environment.

UNCERTAINTIES ABOUT THE WORK

No changes in the type or amount of work are anticipated in this organization.

RESOURCE AVAILABILITY AND CONSTRAINTS

No significant changes in Directorate/Operations Offices resources devoted to ES&H activities are planned.

ES&H representatives (Irene Kan and Karl Olson) offered the following evaluation of the EH&S Division past and future resources and support:

The need for EH&S resources and support for the coming year should be the same as last year.
Directorate/Operations is satisfied with EH&S support during the past year.
Directorate/Operations is highly confident that EH&S will meet its needs in the coming year.
Suggestions for improvements: None submitted.

STAKEHOLDER CONCERNS

Certain units of this organization have extensive contact with Berkeley Lab employees and members of the public, such as vendors and job applicants. It is important to the functioning and reputation of Berkeley Laboratory that tasks are carried out in an efficient and courteous manner.

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Environment, Safety, and Health

INTEGRATED HAZARD APPRAISAL

of

BERKELEY LAB

EARTH SCIENCES DIVISION

July 19, 1996

for
Work Definition and Hazards Identification

EARTH SCIENCES DIVISION

INTRODUCTION

This report initially identifies the work activities and hazards that are present in the Ernest Orlando Lawrence Berkeley National Laboratory (Berkeley Lab or LBNL) Earth Science Division (ESD) as part of the Integrated Hazard Assessment (IHA) process. Activities and hazards were identified in preparation for:

- Definition of the Necessary and Sufficient (N&S), or Work Smart, set of standards, and
- Direction of additional future Environment, Health, and Safety (EH&S) integrated functional appraisals.

In early August 1996, a multidisciplinary team of research and EH&S representatives from Berkeley Lab and Department of Energy (DOE) Oakland Operations was identified (note team listing below). Team members and contributors met two or more times to review available work activity and hazard information, identify hazards related to activities, field-check findings, and complete identification worksheets. Identification worksheet information was then entered into the IHA information management system and reviewed for quality. Identification worksheets are enclosed and are grouped by floors in Buildings 14, 31, 51, 70, 70A, and 90. Building floor plans that show the layout of ESD operations are presented in the Attachment.

The body of this report lists the IHA team participants and gives a project time-line. Summaries of ESD organization and management, ES&H performance expectations and objectives, ESD actions to be performed, ESD physical conditions within which the work will be performed, ESD materials and conditions that could cause adverse consequences, uncertainties about the work, EH&S resource availability and constraints, and stakeholder concerns follow.

IHA TEAM

Team Member	Technical Specialty
Norm Goldstein	ESD Safety Coordinator
Paul Blodgett	LBNL Industrial Hygiene and Team Leader
Steve McConnell	LLNL Occupational Safety
Lisa Snow	LBNL Health Services
Ken Barat	LBNL Radiation Protection
Brian Smith	LBNL Waste Management
Ginny Lackner	LBNL Environmental Protection
June Schwabe	DOE Waste Management
Phil Roebuck	DOE Operations

Other Contributors	Technical Specialty
James Chwang	DOE Fire Protection
Harvey Grasso	DOE Industrial Hygiene
Rich Haddock	DOE Occupational Safety
Judy Kody	LBNL Health Services
Peter Persoff	ESD Researcher
Dave Tudor	LBNL Hazard Assessment

Henry Stauffer LBNL Health Services

PROJECT TIME-LINE

Date	Activity
7/16/96 - 7/23/96	Collect and Review Information
7/19/96 - 7/26/96	Establish Team Members
7/31/96 - 8/06/96	Hazards Identification & Grouping
8/02/96 - 8/09/96	Field-Check Hazards Identification
8/14/96 - 8/16/96	Completion and Data Entry of Worksheets
8/16/96 - 8/19/96	Summary Report Draft
8/20/96 - 8/21/96	ESD Review

ORGANIZATION AND MANAGEMENT

In ESD, each major program is organized as a department or a center with a department/center head.

The departments include:

- Resource Development
- Environmental Remediation Technology
- Nuclear Waste
- Subsurface Geosciences

Each department is staffed either by researchers and support staff working on parts of either a single large, multidisciplinary project, or by staff, sometimes matrixed from other departments, working on a collection of separate but scientifically related projects. The research activities, including the lab facilities under each department, have a strong customer orientation; i.e., are closely aligned to DOE programs and Program Offices. Shifting DOE priorities and organizational changes over time may therefore lead to future changes in the ESD Departmental structure.

The centers include:

- Center for Computational Seismology
- Center of Isotope Geochemistry
- Center for Environmental Technology
- Geoscience Measurements Center

Centers differ from departments in that they have unique scientific focus, represent a distinct laboratory core competency, may serve more than one DOE or other federal sponsor, and include staff and projects from more than one Berkeley Lab Division, as well as one or more UC Berkeley Campus departments.

Principal investigators (PIs) report directly through department or center heads to the Division Director (Sally Benson), and are accountable for the scientific excellence, relevance to the DOE mission, and fiscal integrity of their programs, as well as for adherence to all administrative and regulatory requirements. The Division Director is ultimately responsible for meeting the

requirements of applicable health, safety, and environmental regulations and policy. The Division Safety Coordinator (Norm Goldstein) is charged with oversight of all matters pertaining to environmental quality and health and safety of both employees and the public. An ES&H committee assists in this effort by encouraging a high level of EH&S awareness and evaluating EH&S compliance throughout the division. Each facility within ESD is headed by a Facility Head who is responsible for day-to-day operations, and with the general health and safety, as well as the safety training of everyone working in the facility, including guests and students.

PERFORMANCE EXPECTATIONS AND OBJECTIVES

Research Program Management Responsibility for Safety

Line management is responsible for the protection of the public, the workers, and the environment.

At the Berkeley Laboratory, the following documents establish the policy and provide the implementation guidance that makes line management effectively accountable for protection of workers, the public, and the environment:

- Operations Assurance Plan, OAP (1996)
- Self-Assessment Manual (1992) and Supplement (1996)
- Publication 3000, Environment Health and Safety Manual (1995)
- Chemical Hygiene and Safety Plan (1992)
- Waste Generator Guidelines (1996)
- Employee Performance/Progress Review, Section III (1996)

Clear Roles and Responsibilities

Clear and unambiguous lines of authority and responsibility for ensuring safety are established and maintained at all organizational levels within the department and its contractors.

Each division in the Berkeley Laboratory has clearly defined lines of responsibility down to the working level. Each division designates a research investigator to represent its views and concerns on the Laboratory Safety Review Committee and an employee to act as the ES&H Coordinator. This Coordinator acts as the interface between ES&H concerns and compliance in the workplace and the EH&S technical professionals. The organizational information is updated every 60 days and is retained in the Functional/Facility Notebooks as appropriate (see OAP).

Competence Commensurate with Responsibilities

Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

Job assignments, including hires, are reviewed by line management, and by the compensation group within Human Resources, to ensure that the requirements and responsibilities of a job are matched by the experience, knowledge, and skills of individuals selected for assignment. A performance expectation for managers and supervisors in the Division of Environment, Health and Safety is how well the talents, knowledge, and skills of staff are matched to work assignments and responsibilities

The Laboratory's training program ensures that each staff member, including participating guests, is adequately trained to participate safely in Laboratory activities. Staff, with supervisor participation,

fill out the Jobs Hazards Questionnaire (JHQ) describing the hazards associated with their job assignment and work area. Evaluation of the responses by the Training Coordinator and the cognizant supervisor determines the training regimen needed to carry out work in a manner that protects the employee, co-workers, the public, and the environment.

Balanced Priorities

Resources are effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment is a priority whenever activities are planned and performed.

All environment, safety and health activities in the Laboratory are described in technical terms with budgetary information included. Each year this information is updated, reviewed and prioritized on the basis of risk to workers, the public, and the environment by a Laboratory-wide committee selected to represent programmatic line management and ES & H professionals. This document is utilized by Laboratory senior management in strategically planning the immediate focus and long term goals of the environment, safety, and health program at the Laboratory.

Hazard Controls Tailored to Work Being Performed

Administrative and engineering controls to prevent and mitigate hazards are tailored to the work and associated hazards being performed.

Chapter 6 of the Environment, Health and Safety Manual clearly defines the steps for each line manager to develop the appropriate engineering and administrative controls to mitigate hazards in the workplace. The Laboratory's Self-Assessment Program, including Functional Appraisals by ES&H professionals, and the UC/DOE Contract 98 Performance Measures, provides assurance that implementation of hazards control is adequate to protection workers, the public, and the environment.

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Before work is performed, the associated hazards are evaluated and an agreed-upon set of safety standards and requirements are established, which, if properly implemented, provide adequate assurance that workers, the public, and the environment are protected from adverse consequences.

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risk category at the Berkeley Laboratory. Internal Agreements, describing the performance expectations for each party, are used for operations between two functional areas where the quality of performance might adversely impact the Laboratory's ability to meet its responsibility to protect workers, the public, and the environment.

ACTIONS TO BE PERFORMED

Earth Science's mission is to perform leading multidisciplinary research on geoscience topics of national importance and on engineering development of geotechnical instruments and analysis methods. Research and development activities reflect the division's special emphasis on properties of crustal rocks and fluids, subsurface transport processes, geophysical imaging, and the dynamic behavior of fractured media. These efforts build on the division's foundation of broad strength in fundamental geosciences, with special capabilities to measure, model, and predict subsurface conditions and processes. Continuing excellence will be ensured by the division's commitment to excellence, peer reviews of all divisional projects and work products, and a divisional quality assurance program.

PHYSICAL CONDITIONS WITHIN WHICH THE WORK WILL BE PERFORMED

Building 14

Building 14 is a single-story building, occupied solely by ESD; note the attached floor plan of Building 14 operations. Functional space consists of: a chem lab, a soils lab, a dry lab, seven office spaces, and storage areas for field work operations. The chem lab contains a ventilated enclosure for silicon molding, and the soils lab has a non-ventilated glovebox, freeze dryer, and centrifuge.

Building 31

Building 31 is a single story building which is shared with Facilities gardeners and laborers. Note the attached floor plan of Building 31 operations The space that ESD occupies consists of a shop area, a field work staging area, and an office.

Building 51 and 51B

Building 51 is the decommissioned Bevatron. In Building 51, ESD occupies a chem lab with two fume hoods and a ventilated storage cabinet for waste chemicals. In the attached Building 51B floor plan, ESD only occupies office space in the 51N section.

Building 70

Building 70 is a three-story building. ESD occupies seven laboratory-type rooms on the first floor and a chemistry lab on the second floor. (Note the attached floor plans for Building 70 operations.) The chem labs have a total of five fume hoods and one non-exhausted biosafety cabinet. Analytical instrumentation includes ventilated atomic adsorption and inductively coupled plasma instruments, and gas chromatographs with flame ionization, electron capture, and mass spectroscopy detectors.

Building 70A

Building 70A is a five-story building. ESD occupies 6 laboratory-type rooms; one on the second floor, and the remainder on the fourth floor (the Center for Isotope Geochemistry). (Note the attached floor plans for Building 70A operations.) There are two fume hoods for general chemical use; two perchloric acid hoods with water wash-down systems connected to the acid neutralization system; three positively pressurized, inert gloveboxes (exhausted); an exhausted biosafety cabinet; a gas storage cabinet; a clean room; and a mass spectrometer.

There are also approximately 25 office spaces occupied on Floors 2 through 4.

Building 90 and 90P

Building 90 is a four-story administrative building. ESD occupies approximately 60 offices on the first and second floors, and several rooms for storage, supplies, telecommunication, and conferencing. Building 90P is a two-story temporary building with office space, which ESD solely occupies.

Other Berkeley Lab Locations

ESD has shared research operations with the Accelerator and Fusion Research Department (AFRD) at the Advanced Light Source (ALS) and Life Science Division (LSD) in Building 70A on the fourth floor. The specific hazards are addressed in the other respective divisions' reports.

University of California at Berkeley

Berkeley Lab employees who have affiliation with the Berkeley campus also work in Appendix J space as defined by the memorandum of understanding (MOU) between the Berkeley Lab and the University of California. Buildings in which work is conducted include: Hearst Mining, Evans, Davis, and McCone Halls.

Off-Site Work

ESD conducts fieldwork throughout United States and on occasion internationally. Examples of some of the 1996 field projects include:

Project Name	Site	Location	EH&S Oversight
Very Early Time Electromagnetics (VETEM)	INEL- Cold Test Site	Idaho	Lockheed Idaho Technologies Company (LITCO)
Intermediate Scale Experiments	Mappsville & Oyster	Virginia	LBNL
Lance Water Injection Test	Savannah River	South Carolina	Westinghouse
Algal Bacterial Treatment for Se & N Removal	Panoche Water District	Los Banos, California	LBNL
Analog Site for Fractured Rock Characterization	Box Canyon	Idaho	LITCO
Savannah River Crosswell Seismic Geophysics	Savannah River	Aiken, South Carolina	Westinghouse
Thermal Testing, Exploratory Studies Facility, Yucca Mountain	Nevada Test Site	Nevada	TRW

MATERIALS AND CONDITIONS THAT COULD CAUSE ADVERSE CONSEQUENCES

Examples (not summaries) of typical materials and conditions that could cause adverse consequences if not controlled are listed below. These examples are first listed by Necessary and Sufficient requirements identification topic areas, and then by floors within buildings.

Labs

Chemical Hazards:

Solid, liquid, and gaseous inert and hazardous materials are used typically in small quantities throughout many labs and some shops in all ESD-occupied buildings. Hazardous materials include flammable gases, flammable liquids, inert cryogens, corrosives, reactive or explosives, reproductive toxins, carcinogens, toxic materials, health hazardous gases, and oxidizers. Hazardous materials are commonly used inside high-integrity, closed-systems (e.g., vacuum chambers and gas systems). Hazardous materials that may become significantly airborne are typically handled inside hoods. Personal protective equipment and administrative procedures are used as needed. Given the level of controls used, the overall level of concern for acute or chronic chemical exposure at any one operation is "low." Examples of hazardous materials uses include:

Flammable Gases:

- A few locations use compressed flammable gases in quantities less than two large cylinders (200 CF) typically in association with analytical equipment. Level of concern is "low."

Flammable Liquids:

- Flammable liquids are used throughout ESD in small quantities and are typically organic solvents. Level of concern is "low."

Inert Cryogens:

- Liquid nitrogen is dispensed from large tanks outside Buildings 70 and 51 into 2 liter dewars for transfer to lab areas. Level of concern is "low."
- Cold traps are used in analytical work, "cryofocusing" (Building 70-158). Level of concern is "low."

Corrosives:

- A wide variety of acids are used throughout various ESD labs to digest soils.
- Large volumes, i.e., liters/week, of hydrofluoric and perchloric are used. The level of concern is "moderate."

Reactives or Explosives:

- Heated perchloric acid is used in two hoods (Building 70A-4419 & 4429 with water wash-down systems. Level of concern is "moderate."

Reproductive Toxins:

- Toluene is used in small quantities as a solvent (Building 70-166). Level of concern is "low."
- Lead and mercury are used as a standards in Atomic Adsorption analysis (B70-108). Level of concern is "low."

Carcinogens:

- Small quantities (< 10 g or 10 ml) of chemicals such as chloroform, dichloromethane, and benzene, are used inside hoods (Building 70-166). The level of concern is "low."
- Airborne silica dust is present at the Yucca Mountain field site. Employees have been fit-tested and issued half-mask respirators with HEPA filters. The level of concern is "low."

Toxic and Highly Toxic Materials:

- Generally in ESD handling of these chemicals is frequent but in small quantities per use. The level of concern is "low."
- Metals and unknown VOCs may be present at the Idaho field site. The level of concern is "moderate."

Health Hazard Gases:

- A small quantity cylinder of bromine pentafluoride is dispensed into vacuum system (Building 70A-4431). There is a written AHD for this operation. The level of concern is "low."

Oxidizers:

- Oxidizing acids (e.g., nitric acid) and gases (e.g., oxygen) are used. The level of concern is "low."

Electrical Hazards:

- There is an Inductively Coupled Plasma (ICP) analyzer with a power supply greater than 600 Volts (Building 70-108). The level of concern is "low."
- A 22 kV high pulse generator (Building 51). Level of concern is "low."
- A high voltage power supply on lasers (Building 70A-4431). Level of concern is "low."
- Repair of electrical equipment less than and greater than 120 volts is done in Building 31. The level of concern is "moderate."

- A 45 kV transformer (Building 70-108). The level of concern is "low."
- A 100 amp rock-melting furnace. The level of concern is "moderate."
- One of the well-logging trucks in the field has a 30 kV source for piezoelectrics. The level of concern is "low."
- Mass spectrometers have power supplies greater than 600 volts (Building 70A-4421). The level of concern is "moderate."

Hydraulic Systems:

- Hydraulic systems are used to conduct fatigue testing on materials (Building 51). The level of concern is "low."
- Hydraulic systems on water pumping trucks in the field. The level of concern is "moderate."

Mechanical Equipment:

- Lightweight metal machining is conducted in the Building 31 shop. Level of concern is "low."
- A motor-driven winch at the Savannah River Site. The level of concern is "low."

Lasers:

- There is a CO_2 laser present in Building 70A-4431 but is not in use. Lasers are controlled as specified in Pub 3000 and there is a written AHD. Level of concern is "low."
- Medical monitoring includes laser eye exams for laser users.

Non-Ionizing Radiation:

- There is a UV light in a hood in Building 70-2275. Level of concern is "low."
- An inductively coupled Plasma (ICP) has radio frequency (RF) and magnetic fields (Building 70-108). Level of concern is "low."
- The sun is a UV source for field workers. The level of concern is "moderate."

Pressure and Vacuum Hazards:

- Small to large cylinders of inert and hazardous gases are used throughout ESD with regulators and appropriate gas system components. The level of concern is "low."
- A 50 psi sterilizer is used in Building 70-158 for drying glass ware. The level of concern is "low."
- Bore hole packers in the field can be pressurized to 100 psig. The level of concern is "low."

Biological Hazards:

- Naturally occurring soil microorganisms are used in ESD research. No Class 3 or 4 infectious agents are used. Level of concern is very "low."
- There is a potential for Hanta virus, biting and stinging insects, and poison oak in most of the field sites. The level of concern is "moderate."

Ovens and Furnaces

- Drying ovens are commonly used. Level of concern generally "low."

Unattended Operations

- Research experiments and apparatuses are sometimes run in an unattended mode, especially during the daytime, but the consequences of failure yield a general "low" level of concern. Generally, more evaluation of this item is needed to identify any potential concerns.

Satellite Accumulation Areas (SAA):

- There are approximately 14 SAAs in ESD. The level of concern is "moderate to low."

Facilities

Shop Equipment, Welding/Soldering:

- Rotating and cutting equipment is kept in small machine shop (Building 31-105/107). The level of concern is "moderate."
- Welding operations are done at Building 31. The level of concern is: "low."
- An ox-acetylene torch is used for glass bending (Building 70-4419). The level of concern is "low."

Cranes or Hoists:

- There is a monorail crane in Building 70-108 that is locked out of service. The level of concern is "low."

Personnel Falls/Platforms/Lifts:

- An elevated platform is located in Building 31-100. The level of concern is "low."
- Well heads are at field sites. The level of concern is "moderate."

Seismic Hazards:

- Tall and/or valuable lab research equipment is typically secured in labs. The overall concern is "low."
- Evaluation of seismic bracing for the Atomic Adsorption instruments in Building 70A-158 needs to be conducted. The level of concern is "moderate."
- There is an issue with tall and expensive equipment in Building 70-2275. The level of concern is "moderate."

Noise:

- A soil crusher (Building 14-106) has been evaluated for noise. Sound levels are 75 dBA. Level of concern is "low."
- Noise is monitored in the Exploratory Studies Facility at Yucca Mountain. Noise levels are known to exceed 95 dBA near mining machinery and all workers are required to wear hearing protection.

Heat/Cold Stress

- Heat and cold stress are considerations for field work at all sites. The level of concern is "moderate."

Accelerators and Radiation Sources

Class 1 Radiological work

- Radio-labeled carbon 14 is used in Building 70-166. The level of concern is "low."
- Radio-labeled cesium 137, plutonium 239, and neptunium 237 are used in Building 70-2275. The level of concern is "low."
- Medical surveillance for this work includes dosimetry.

Sealed Sources:

- A scintillation counter is used in Building 70-166. Level of concern is "low."
- A cesium 137 source is used in sighting equipment in the field. The level of concern is "low."

Environment

- EBMUD general site permit. Level of concern is "low."
- Building 70A acid waste drain and treatment system. Level of concern is "moderate."
- The need for RWQCB permit for the water treatment plant at the Los Banos site needs further evaluation. The level of concern is "moderate."

Core

Repetitive Motion:

- Office work at video display terminals at all locations may lead to cumulative trauma injuries. The level of concern that some injury may occur is estimated to be "moderate." A few cumulative trauma injuries in offices have been reported in ESD in the last year. There are approximately 100 offices in ESD.

Fieldwork

- Fieldwork is an important part of ESD research and typically consists of lowering various types of sensors into bore holes to collect data, conducting pump tests in wells, or collecting rock, soil, or water samples. Pre-existing wells are generally used. Some project have involved drilling new wells or conducting excavations. Nuclear waste studies involve site characterization, actinide geochemistry, and participation in international programs.

Vehicles:

- An on-site motor vehicle is used by ESD personnel. The level of concern is "moderate."
- Incidental fork lift use at Building 31. The level of concern is "moderate."
- 4-wheel drive and large vehicle (construction) use in the field at many sites. The level of concern is "moderate."

UNCERTAINTIES ABOUT THE WORK

There are no unique uncertainties (e.g., research projects) that will impact hazard identification and selection of applicable and appropriate standards and requirements.

RESOURCE AVAILABILITY AND CONSTRAINTS

The following questionnaire was filled out with input from the ESD Safety Coordinator.

Are resources and support expected and/or needed from EH&S in the coming year?

Yes - Ongoing support is needed for the following areas: consultation, design review, self-assessment , waste generator assistance, etc.

- Now that you have evaluated EH&S support during the past year and determined the expectations for the coming year, describe your level of satisfaction in EH&S meeting the needs of your division in the current year:

High - Continue to provide quality service to the Division.

- What is your level of confidence that EH&S can meet divisional needs in the coming year?

Moderate to High

- What would it take to increase this rating?

a) Training/JHQ - Remove training requirements for researchers on campus who work at Berkeley Lab and have similar training but are required to take Berkeley Lab EH&S Classes.

b) Training - Deletions of retired employees from the inventory.

c) Chemical Inventory - Training of employees in removing empty containers from the inventory.

STAKEHOLDER CONCERNS

There are no stakeholder concerns unique to ESD. ESD has managed, controlled, and permitted (as required) air, water, hazardous, and solid waste streams.

Environment, Safety, and Health

INTEGRATED HAZARD APPRAISAL

of

BERKELEY LAB

ENERGY & ENVIRONMENT DIVISION

September 26, 1996

for
Work and Hazards Identification
to
Define the Necessary and Sufficient Standards Set
and
Direct Appraisal Efforts

INTRODUCTION

This report initially identifies the work activities and hazards that are present in the Ernest Orlando Lawrence Berkeley National Lab (Berkeley Lab or LBNL) Energy and Environment Division (E&E) as part of the Integrated Hazard Assessment (IHA) process. Activities and hazards were identified in preparation for:

- Definition of the Necessary and Sufficient (N&S), or Work Smart, set of standards, and
- Direction of additional future Environment, Health, and Safety (EH&S) integrated functional appraisals.

In late July 1996, a multi-disciplinary team of research and EH&S representatives from Berkeley Lab, Department of Energy (DOE) Oakland Operations, and Lawrence Livermore National Laboratory (LLNL) was identified (note team listing below). Team members and contributors met four or more times to review available work activity and hazard information, identify hazards related to activities, field-check findings, and complete IHA worksheets. IHA worksheet information was then entered into the IHA information management system and reviewed for quality.

The E&E Division activities were divided into 28 areas of similar work activities or research objectives. Facility Notebooks were previously developed for most of these 28 areas. A list of these 28 areas is attached. One IHA worksheet was completed for each of the 28 areas. The first 27 worksheets cover E&E research activities; the last worksheet covers all E&E office areas. Worksheets are available on the Berkeley Lab website. Building floor plans that show E&E spaces are attached to hard copies of this report.

The body of this report summarizes the IHA team participants, project time-line, E&E organization and management, Environment, Safety, and Health performance expectations and objectives, E&E actions to be performed, E&E physical conditions within which the work will be performed, E&E materials and conditions that could cause adverse consequences, uncertainties about the work, EH&S resource availability and constraints, and stakeholder concerns.

INTEGRATED HAZARD ASSESSMENT TEAM

Participant	Technical Specialty
Ken Barat	LBNL EH&S Division Liaison, Laser Safety, & X-ray Safety
Brad Bingham	LBNL E&E Division Safety Coordinator
Richard Haddock	DOE Occupational Safety
Al Hodgson	LBNL E&E Research Representative
Bruce King	LBNL Team Leader, Industrial Hygiene
Ginny Lackner	LBNL Environmental Protection
Steve Leeds	LLNL Fire Protection
Ken Rivera	DOE Site Office
Carl Schwab	DOE Environmental Protection
Brian Smith	LBNL Hazardous Waste Management

PROJECT TIME-LINE

Date	Activity
7/22/96 – 8/05/96	Collect and Review Information
7/31/96 – 8/05/96	Establish Team Members
7/29/96 – 8/02/96	Identify Operational Grouping
8/04/96 – 8/06/96	Hazards Identification from Available Information
8/08/96 – 8/09/96	Field-Check Hazards Identification
8/12/96 – 8/23/96	Completion (done 8/12) and Data Entry of Worksheets
8/16/96 – 8/16/96	Summary Report Draft, Revision 1
8/16/96 – 9/26/96	Summary Report Final, with minor revisions

ORGANIZATION AND MANAGEMENT

The Energy & Environment (E&E) Division is made up of five research programs, three coordinating centers, one research unit, and a Washington, D.C. office. The E&E Division organization charts are attached to hard copies of this report. The five Research Programs are:

- Building Technologies
- Energy Analysis
- Indoor Environment
- Environmental Research
- Energy Conversion and Storage

The three coordinating centers are:

- Berkeley Electrochemical Research Center
- Center for Atmospheric and Biospheric Effects of Technology
- Center for Building Science

The University of California Research Unit is The California Institute for Energy Efficiency.

On-site operations are located in Berkeley Lab Buildings 2, 46, 53, 62, 63, B67B, B67C, B67E, 70, 90, 73, and 934. Major locations of E&E personnel and research activities are located in Buildings 70 and 90. Building floor plans that note E&E research operation ownership are attached.

The E&E Division has approximately 366 personnel in the following categories: 119 scientific staff, 100 technical staff, 50 administrative staff, 50 UCB Facility/staff, and 47 graduate student Research Assistants.

The E&E Division Principal Investigators report to one of five Program Heads, who in turn report to the E&E Division Council and Division Director's office. The division also has three Coordinating Center Heads, a Research Unit Head, and a Washington Office Head, who report to the Division Director's office. These organizations coordinate interdisciplinary research within the division and foster partnerships with outside agencies.

The Principal Investigators are accountable for the scientific excellence, relevance to the DOE mission, and fiscal integrity of their programs, as well as adherence to regulatory requirements.

The Division Safety Committee Chairperson, Al Hodgson, is charged with disseminating safety information, lab-wide safety programs, and OAA programs. To aid the committee, Brad Bingham serves as Division Safety Coordinator.

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ACTIONS TO BE PERFORMED

The following are brief summaries of the functions and missions of each E&E Division Research Program, Coordinating Center, and Research Unit.

Building Technologies Research Program

The Building Technologies Program focuses on two major systems in buildings: windows and lighting. The program also has a goal to create advanced simulation and design tools that enable building professionals to fully integrate energy efficient technologies into new and existing buildings, and to extend the market penetration of these technologies. This program consists of four sub-programs: Windows & Daylighting, Simulation Research, Lighting Systems, and Advanced Building Systems.

Energy Analysis Research Program

The Energy Analysis Program focuses on energy use rather than energy extraction or conversion. The program develops and uses an array of simulation models for estimating the impacts of energy-efficient technologies in buildings, appliances, urban environments, and utility resource plans. This sub-program consists of six sub-programs: Building Energy Analysis, Utility Planning and Policy, International Energy Studies, Global Energy/Environmental Issues, Energy Conservation Policy, and Technology Policy Assessment.

Indoor Environment Research Program

The Indoor Environment Program conducts integrated research on ventilation, indoor air quality, and efficient energy use in buildings. This includes infiltration and thermal distribution systems, and human exposure to indoor air pollutants. The program consists of five subprograms: Performance of Buildings, Indoor Chemistry, Indoor Radon, Exposure and Risk Analysis, and Indoor Air Quality Studies.

Environmental Research Program

The Environmental Research Program's goal is to understand and mitigate anthropogenic effects on the environment. Researchers investigate and develop efficient and environmentally benign combustion, methods of pollution abatement, destruction of toxic pollutants, and novel methods of detection and analysis of criteria and noncriteria pollutants. This program consists of four sub-programs: Combustion Process, Ecological Systems, Atmospheric Processes, and Flue-Gas Chemistry.

Energy Conversion and Storage Research Program

The Energy Conversion & Storage Program is developing new processes and materials for more efficient environmentally benign energy conversion and storage technologies. Projects focus on transport-process principles, chemical kinetics, thermodynamics, separation processes, organic and physical chemistry, novel materials and advanced methods of analysis. The program is made up of three sub-programs: Material Applications, Chemical Applications, and Electrochemistry.

Coordinating Centers

The Center for Atmospheric & Biospheric Effects of Technology, Center for Building Science, and Berkeley Electrochemical Research Center coordinate interdisciplinary research within the division.

California Institute for Energy Efficiency Research Unit

The California Institute for Energy Efficiency is a UC-organized research & development partnership of utilities, energy agencies, and research facilities.

PHYSICAL CONDITIONS WITHIN WHICH THE WORK WILL BE PERFORMED

On-site operations are located in Berkeley Lab Buildings 2, 46, 53, 62, B63, 67B, B67C, B67E, 70, 90, 73, and 934. Major locations of E&E personnel and research activities are located in Buiildings 70 and 90. Building floor plans that note E&E research operation ownership are attached.

Building 2

Building 2 is a late-1980s vintage, four-story laboratory and office building. Note the attached floor plans of Building 2 E&E operations. Only four of the approximately 65 research lab rooms in Building 2 belong to E&E. These four labs belong to two different E&E groups: Thin Films and X-Ray Spectroscopy.

Building 46

Building 46 is an older, long, two-story metal-siding building. The E&E Lighting Systems facility occupies work and lighting systems testing areas on the first and second floors of a portion of the building.

Building 53

Building 53 is an older, metal-siding building with the ground floor at different elevations. The Infrared Thermography facility occupies only four research areas in this building.

Building 62

Building 62 is a concrete-structure, three-story lab and office building. Only three or four of the 31 lab rooms in B62 belong to E&E. Note the attached floor plans of Building 62 operations. These areas belong to two different E&E groups: Electrochromics and Materials Applications. Electrochromics operations utilize inert-atmosphere gloveboxes. Lab hoods are present.

Building 63

Building 63 is a small, high, one-story metal structure with some interior wood-stud and sheetrock rooms. The Indoor Environment Program occupies two-thirds of the building with standard-room-construction environmental chambers. The Building Technologies Program occupies one-third of the building and includes a scanning radiometer.

Buildings 67B, 67C, and 67E

Buildings B67B, B67C, and B67E are trailers in the Blackberry Canyon parking lot that house offices and two E&E research facilities: Building Technologies Mowitt Operations and Indoor Environment Air Leakage.

Building 70

Building 70 is an older, concrete-structure, large, two-story lab and office building. Labs typically have lab hoods exhausted to single blowers on the roof. Note the attached floor plans of Building 70 E&E operations. The E&E Division occupies roughly two-thirds of the lab space in Building 70. Sixteen of the 27 E&E Research "Facilities" are contained in Building 70.

Building 73

Building 73, The Aerosol Research Building, is located in Strawberry Canyon, and is accessible via Centennial Drive. Building 73 is a single-story, two-level, wood-frame building with three or four lab spaces, offices, and a very small shop. Building 73 is only occupied by one E&E facility: Atmospheric Processes. Two labs hoods are present.

Building 934

Building 934 is a large, single-story rented lab and office building located adjacent to Berkeley Aquatic Park near Interstate 880. Only one Life Science and environmental research-oriented E&E facility is located at Building 934. All other labs at Building 934 belong to the Life Science Division.

University of California Berkeley

Operations on the University of California Berkeley (UCB) campus are primarily located in Gilman, Lewis, and Wurster Halls.

MATERIALS AND CONDITIONS THAT COULD CAUSE ADVERSE CONSEQUENCES

Typical materials and conditions that could cause adverse consequences if not controlled are listed below. These examples are first listed by Necessary and Sufficient requirements identification topic areas, and then by hazard categories. Typical levels of concern (LOC) are also shown based on the estimated level of control that is implemented or achievable. The typical LOC throughout E&E for the hazards that were identified is "low" (L). Levels of concern noted as "moderate" (M) may need additional future evaluation to verify this level of concern and adequacy of controls.

Labs

Chemical Hazards:

Solid, liquid, and gaseous inert and hazardous materials are used typically in smaller quantities throughout many labs and some shops in all E&E-occupied buildings. Hazardous materials include flammable gases, flammable liquids, inert cryogens, corrosives, reactives or explosives,

reproductive toxins, carcinogens, toxic materials, health hazard gases, and oxidizers. Hazardous materials that may become significantly airborne are typically handled inside hoods. Personal protective equipment and administrative procedures are used as needed. Given the level of controls used, the overall level of concern for acute or chronic chemical exposure at any one operation is "low." Examples of hazardous materials uses include:

- General:
  - General wet chemistry is common throughout E&E.

- Flammable Gases:
  - Many locations use compressed flammable gases in quantities less than two large cylinders (200 cf). LOC=L.
  - The combustion lab (Building 70, Room 141) has systems to burn flammable gas and an AHD. Total gas quantities are limited. LOC=L.

- Flammable Liquids:
  - Flammable liquids are used throughout E&E in smaller quantities and are typically organic solvents.
  - Flammable and combustible liquids are the only primary chemical hazard for some E&E labs (Building 53 Windows and Daylighting)

- Inert Cryogens:
  - A cryostat is in use (Building 6, Room 250)
  - A 160L LN2 dewar is in use (Building 7, Room 274)
  - LN2 is used in spectroscopy (Building 7, Room 133)
  - Cell storage in LN2 (Building 93, Room 32)
  - Small LN2 dewar in use (Building 62, Room 220)

- Corrosives:
  - A wide variety of common corrosive solutions are used throughout various E&E labs.

- Reactives or Explosives:
  - Use of highly-reactive, flammable-solid, lithium metal in inert atmosphere gloveboxes (Building 62, Rooms 220, 246, and 350; Building 70, Room 218). AHDs are developed. LOC=M due to past lithium fires at Berkeley Lab and E&E.
  - Other solids or liquids that can be reactive are sometimes present in E&E labs. LOC=L.

- Carcinogens and Reproductive Toxins:
  - Carcinogen and reproductive toxins' presence were noted on the following worksheets: Building 70 Ecological Systems (Building 70, Rooms 129, 260, and 264; Batteries and Fuel Cells (Buildings 62 and 70), Indoor Chemistry (Building 70), Chemical Remediation Pollution Prevention (Building 70, Rooms 269, and 274), Energy Conversion and Storage Chemical & Material Applications (Building 70, Rooms 123, 157, 215, 114, and 220), Windows and Daylighting (Building 2, Rooms 308, 362; Building B67B). LOC=L.
  - Laser dye solutions are mixed inside lab hoods.

- Health Hazard Gases:
  - Carbon monoxide, sulfur dioxide, hydrogen sulfide are in use in metal and glass apparatuses in hoods and AHDs are approved (Building 70, Rooms 269 and 274). LOC=L.
  - Fluorine and hydrogen chloride gases are used in excimer lasers (Building 70, Rooms 163 and 291). LOC=L in Building 70, Room 263. LOC=M in Building 70, Room 291 because

laser exhaust systems are not adequate and gases (chlorine and hydrogen sulfide) that are on the chemical inventory are not included in the AHD.
  - Carbon monoxide (appears to be low concentration mix) is used (Building 70, Room 217). LOC=L.
  - Ammonia, hydrogen chloride, and boron trifluoride are used in lab hoods with an AHD (Building 70, Room 123). LOC=L.
  - Health hazard gases are present, but not currently used, at Building 73 for aerosol research.
  - An ammonia gas cylinder is present outside a hood. Use was not determined. LOC=M and needs further evaluation.

- Oxidizers:
  - Oxidizing acids (e.g., nitric acid) and gases (e.g., oxygen) are commonly used. LOC=L.
  - Strong oxidizing agents are present at some locations: bromine (Building 62, Room 250). LOC=L.
  - Oxygen gas is commonly dispensed from cylinders.

Electrical Hazards:
- Custom-built electrical equipment (Building 70, Rooms 103, 133, 134; Building 62, Room 250; Buildings B67B&C) and maintenance/repair of electrical equipment (Buildings 62, Room 250; Buildings B67B&C, and 64). LOC=L.
- Research battery charging and discharging (Building 70, Room 299). LOC=L.
- Lasers have power supplies (Building 2, Room 335, Building 70, Rooms 163, 141, 157, 269, 291). LOC=L.
- Electrophoresis (Building 934). LOC=L.

Mechanical Equipment:
- Lab centrifuges are in use (Building 70, Rooms 129, 208, 260, and 264; Building 934, Room 32). LOC=L.
- Small vacuum pumps with belts are used in various labs. LOC=L.
- Some ventilation blowers with belts or moving blades may be used in indoor environment research (Building 70, Room 174). LOC=L.

Lasers:
- The following approximate number of Class 3b or 4 laser labs are present: Building 2 (2), Building 62 (1), and Building 70 (4). Lasers are controlled as specified in PUB-3000. LOC=M due to potential for eye injury.
- Medical monitoring includes laser eye exams for laser users.

Non-Ionizing Radiation:
- A user-modified ultraviolet light (UVb) source is used in the Ecological Systems group, in an enclosure to kill or measure the effect on small marine organisms. Reportedly personal protective equipment is used if personnel must reach inside the enclosure. LOC=L.
- Ultraviolet light is emitted from lasers at (Building 70, Room 291). AHD is present. LOC=L.
- Low-power magnetic and microwave fields are present on an electron spin resonance spectrometer (Building 70, Room 129). LOC=L.
- An RF sputtering system is used (Building 2, Room 322). LOC=L.
- An UV spectrometer is used (Building 2, room 308). LOC=L.
- A sodium vapor light may reportedly be an UV light source (Building 46 Lighting Group). LOC=L.

Pressure and Vacuum Hazards:
- Small to large cylinders of inert and hazardous gases are used throughout E&E with regulators and appropriate gas system components. LOC=L.
- Autoclaves are in use (Building 70, Room 264A and Building 934). LOC=L.
- Health hazard gases are flowed through glass apparatuses inside lab hoods with an AHD (Building 70, Room 269). LOC=L.
- Vacuum chambers greater than 10 cf are present (Building 70, Room 291).
- Manual hydraulic ram (Building 70, Room 123). LOC=L.
- Supercritical Extraction Vessel, pressure vessel with stored energy and heaters (Building 70, Room 114). AHD developed. LOC=M.
- Brittle 3-foot vacuum line and vacuum equipment backfilled from a pressure source (Building 62, Room 220). LOC=M.
- Vacuum equipment with windows greater than 4 inches (Building 2, Room 362; Building 70, Rooms 163 and 157) and backfilled from a pressure source, in addition to LN2 cold traps and pipes, are used (Building 2, Room 362).

Biological Hazards:
- Non-infectious human cell waste (Building 934, Room 32). LOC=L.
- Very small samples of human blood are exposed to cigarette smoke and then analyzed with a spectrometer (Building 70, Room 129). LOC=L.
- No Class 3 or 4 infectious agents are used.

Ovens and Furnaces
- Several locations have ovens (Building 70, Rooms 108, 264A, 123, 215, 134/138; Building 62, Room 350)

Unattended Operations
- Research experiments and apparatuses are often run in an unattended mode, especially during the day, but the consequences of failure yields LOC=L. Generally, more evaluation of this item is needed to identify any potential concerns. Examples: Building 70 battery testing bank.

Satellite Accumulation Areas (SAA):
- There are approximately 30 SAAs in E&E. LOC=L. LOC exception: Lithium metal disposal in several operations, LOC=M, due to two fires at Berkeley Lab in recent years due to improper handling of lithium waste. Lithium operations have AHDs.

Field Work:
- Indoor and outdoor environmental sampling is conducted by The Indoor Environment and Environmental Research Programs.
  - Indoor and outdoor environmental air sampling is conducted by Indoor Chemistry personnel. LOC=L.
  - MOWITT (mobile window test facility) is located at the Nevada Test Site and is visited periodically by personnel located in Reno. LOL=L.
  - The Ecological Systems group does field work that involves use of an inflatable boat and/or waders in S.F. Bay in water 2 to 25 feet deep. LOC=L, but additional evaluation may be needed

Facilities

Shop Equipment:
- E&E has several small shops with shop equipment: LOC=L.
  - The Windows and Daylighting Group shop has a table saw, mill, lathe, and portable power tools at Building 53.
  - A very small shop is present at B73 including some fixed and portable power tools.
  - Fixed and portable power and belt shop equipment (drill and sander) is used at Building B67C.
- Portable power tools are used in some E&E operations (Building 62, Room 250; Building 70, Rooms 108, 134,138). LOC=L.
- Diamond saw for cutting glass (Building 70–Materials Applications/aerogels). LOC=L.

Cranes or Hoists:
- Manual hoist used (Building B67B). LOC=L.
- A 1.5 ton monorail crane is present, but not in use by occupants (Building 70, Room 163)

Personnel Falls/Platforms/Lifts:
- The Windows and Daylighting Group has a mezzanine storage attic area with a personnel rail. LOC=L.

Seismic Hazards:
- Tall and/or valuable lab research equipment should typically be secured in labs (e.g., electronic racks). LOC=L

Noise:
- Ear-muffs are present in a small lab space in Building 70, Room 134. Use was not determined and needs evaluation. Portable power tools (drills) are present. LOC=L.

Accelerators and Radiation Sources

"X-Ray Machines"
- Only two E&E machines have enough potential for X-ray emission to be on the EH&S "X-ray Machine" list. These machines are: (3) X-ray machines/spectroscopy in B70-133.

Radiation Work Authorization
- Class 1 RWA (Building 70, Room 108C). Neutron activated mineral samples are present. One sealed source custodian (F. Asaro) is listed. Radiation dosimetry is conducted. LOC=L.
- Class 1 RWA (Building 934, Rooms 45 and 46). Radiation use includes 5mCi of benzo(a)pyrene in use; other small quantities of inherited radioactive materials not in use; and radiation and mixed waste.

X-Ray Spectroscopy:
- X-ray hazards are shielded by the metal vacuum chamber (Building 2, Room 335) and only incidental x-rays are produced LOC=L.

Sealed Sources:
- The EH&S inventory of radiation sealed sources only lists eight sealed source custodians in E&E. LOC=L.

Environment

- EBMUD general site permit applies to all lab sink drains. LOC=M because of the potential for solvents or metals to be discharged to drains and a violation last year by improper use of a rotary evaporator at Building 62.
- EBMUD fixed treatment unit permit applies to the neutralization system for select drains in Building 70. LOC=M.
- BAAQMD general solvent-wipe permit. LOC=M.
- Ozone Depleting Substances: Small quantities of carbon tetrachloride (Building 70, Rooms 218, 223, 269, 291), freons (Building 70, Rooms 114, 220, 223, 138; Buildings B67B&C; Building 73, Rooms 001/002), TCA (Building 70, Rooms 223 and 291; Building 73, Rooms 001/002), chlorodifluoromethane (Building 73, Rooms 001/002) are present in various locations. Refrigerators are common and may contain ODSs. LOC=L.

Core

Ergonomics:
- Office work at video display terminals at all locations may lead to cumulative trauma injuries. The LOC=M that some injury may occur. Several cumulative trauma injuries in offices have been reported in E&E in the past. There are approximately 366 people in E&E, many of which work at VDTs.
- Pipetting in the Building 70 Ecological Systems group was reported to be a potential repetitive motion hazard. LOC=L.
- Window frames are manually lifted at Building 53. LOC=L.

Vehicles:
- Some vehicles are non-routinely used by E&E personnel. LOC=L.

Field Work:
- Note the "Labs, Field Work" section above.

UNCERTAINTIES ABOUT THE WORK

There are no unique uncertainties which will impact hazard identification and selection of applicable and appropriate standards and requirements. The potential changes in E&E facilities will not significantly alter the overall hazards or requirements.

The E&E Division anticipates that research funding in some areas will decline in the future, and funding will be greatly impacted by any changes in the United States political environment.

RESOURCE AVAILABILITY AND CONSTRAINTS

No significant changes in E&E Division resources devoted to ES&H activities are planned.

Brad Bingham, E&E Division Safety Coordinator, offered the following evaluation of the EH&S Division past and future resources and support:

- E&E would like more EH&S service per unit of research that is occurring, but the amount of E&E research in the future is anticipated to decline. The E&E Division would like more direct assistance from EH&S personnel in getting things done (e.g., self-assessments, waste generator assistance, etc.), so that researchers can focus more on research.
- E&E is "moderately" satisfied with EH&S support during the past year.
- E&E is "moderately" confident that EH&S will meet E&E needs in the coming year.

STAKEHOLDER CONCERNS

There are no stakeholder concerns unique to E&E. The E&E Division has managed, controlled, and permitted (as required) air, water, hazardous, and solid waste streams.

ATTACHMENTS & IHA WORKSHEETS

The following items are attached to this summary report:

- List of E&E IHA Worksheet Operational Groupings
- E&E organization charts (hard-copy only)
- E&E operations floor plans (hard-copy only)

IHA worksheets for E&E operations that were completed as part of this project are available at Berkeley Lab on the web site at http://www.lbl.gov/Workplace/NS-Program/

ATTACHMENT

ENERGY AND ENVIRONMENT DIVISION
INTEGRATED HAZARD ASSESSMENT WORKSHEET OPERATIONAL GROUPINGS

FACILITY & IHA WORKSHEET NUMBER	BUILDING(S) & LAB ROOMS	PRINCIPAL INVESTIGATOR	FACILITY MANAGER	RESEARCH PROGRAM
#1 ECOLOGICAL SYSTEMS	70-208, 258, 260, 264, 264a, 264b	Anderson	Anderson	Environment
#2 INFRARED THERMOGRAPHY	53-101, 103, 103B, 103C	Arasteh	Arasteh	Building Technologies
#3 MATERIAL APPLICATIONS	62-250	Berdahl	Berdahl	Energy Conversion & Storage
#4 ELECTROCHEMISTRY	70-206, 218, 295/297, 299, 62-238, 246	Cairns, McLarnon, Kinoshita	McLarnon	Energy Conversion & Storage
#5 FLUE GAS CHEMISTRY	70-269, 274	Chang, Littlejohn	Littlejohn	Environment
#6 COMBUSTION RESEARCH	70-141, 291/293	Cheng, Lucas	Cheng	Environment
#7 X-RAY SPECTROSCOPY	70-133(Half)	Giaugue	Giaugue	Environment
#8 HIGH PRECISION NEUTRON ACTIVATION ANALYSIS	70-103, 108C, 133(Half)	Asaro	Asaro	Environment
#9 BIOLOGICAL X-RAY SPECTROSCOPY	2-335, 355	Cramer	Cramer	Energy Conversion & Storage
#10 INDOOR ENVIRONMENT CHEMISTRY: ENVIRONMENTAL CHAMBER & MASS SPECTROMETER	70-223, 221, 217, 289	Hodgson	Hodgson	Indoor Environment
#11 INDOOR ENVIRONMENT CHEMISTRY: PREPARATION & CHROMATOGRAPHY	70-201, 103(Half)	Gundel	Gundel	Indoor Environment
#12 UNTITLED	934 (DYMO) - future move to Bldg 70 pending	Goth-Goldstein	Goth-Goldstein	Environment
#13 ORGANOMETALLIC CHEMISTRY	70-213, 215, 123	Fish	Fish	Energy Conversion & Storage
#14 INDOOR AIR QUALITY CONTROLS	70-134, 138	Fisk	Fisk	Indoor Environment
#15 INDOOR RADON RESEARCH	70-278, 63-101, Santa Cruz	Sextro	Sextro	Indoor Environment

ATTACHMENT

ENERGY AND ENVIRONMENT DIVISION
INTEGRATED HAZARD ASSESSMENT WORKSHEET OPERATIONAL GROUPINGS
(Continued)

FACILITY & IHA WORKSHEET NUMBER	BUILDING(S) & LAB ROOMS	PRINCIPAL INVESTIGATOR	FACILITY MANAGER	RESEARCH PROGRAM
#16 MICROSTRUCTURED MATERIALS & PROCESSES	70-220, 226, 249, 114(Half)	Hunt	Hunt	Energy Conversion & Storage
#17 MOWITT OPERATIONS	B67B, E, Nevada Test Site	Klems	Klems	Building Technologies
#18 SCANNING RADIOMETER	63-103	Klems	Klems	Building Technologies
#19 ELECTROCHROMICS	62-220, 350	Rubin	Kerr	Energy Conversion & Storage
#20 HEAVY METAL/FREE RADICAL TOXICOLOGY	70-129	Mehlhorn	Mehlhorn	Environment
#21 DUCT SYSTEM RESEARCH	70-174	Modera	Modera	Indoor Environment
#22 ATMOSPHERIC PROCESSES	73, 73A	Novakov	Novakov	Environment
#23 THIN FILMS	2-308, 362	Rubin	Rubin	Building Technologies
#24 LIGHTING SYSTEMS	46-157, 157A, 157B, 157C, 159, 159A, 2XX	Rubinstein	Rubinstein	Building Technologies
#25 LASER MATERIAL INTERACTIONS	70-157, 163	Russo	Russo	Energy Conversion & Storage
#26 AIR LEAKAGE	B67C	Sherman	Sherman	Indoor Environment
#27 ENVIRONMENTAL ANALYSIS	70-275	Littlejohn, Lucas	Littlejohn	Environment
#28 ALL E&E OFFICES	2, 46, 53, 62, 63, 67B, 67C, 67E, 70, 73, 90, 934	N/A	N/A	All

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Environment, Safety, and Health

INTEGRATED HAZARD APPRAISAL

of

BERKELEY LAB

ENGINEERING DIVISION

SEPTEMBER 4, 1996

for
Work Definition and Hazards Identification

ENGINEERING DIVISION

September 4, 1996

HAZARDS IDENTIFICATION TEAM

Team Member	Technical Specialty
Chester Chang	Facilities Mgmt. (DOE Site Office)
James Chwang	Fire Protection (DOE Oakland)
Paul Davis	Industrial Hygiene and Team Leader
Connie Grondona	Health Services
Steve Leeds	Fire Protection (LLNL)
Curtis Nunnally	Engineering Division Safety Coordinator
Don Rondeau	Engineering Division Reviewer
Carl Schwab	Environmental Protection (Site Office)
Anita Whichard	Engineering Division Safety Coordinator (substitute)
Maxwell Yao	Environmental Protection
Tony Yuen	Fire Protection

PROJECT TIME-LINE

Activity	Date
Collect and Review Information	6/17/96 – 6/27/96
Establish Team Members	6/27/96
Overview of Division	7/11/96
Initial Hazards Identification & Grouping	7/22/96
Field Check Spaces	7/31/96
Finalize Risk Survey Sheets	8/1/96 – 8/6/96
Summary Report Draft	8/13/96
Final Report	9/4/96

ORGANIZATION AND MANAGEMENT

The Engineering Division consists of eight line departments which provide resources and activities in support of the whole division. Department heads report directly to the Division Director (Ed Burgess) and are responsible for the scientific excellence, relevance to the DOE mission, and fiscal integrity of their departments. This also includes adherence to all administrative and regulatory requirements. The Division Safety Coordinator (Curtis Nunnally) is charged with oversight pertaining to environment, safety, and health (ES&H) matters. The Division Safety Coordinator reports to the Deputy Division Director (Don Rondeau). An ES&H Committee meets periodically and provides guidance to the Division Director with regard to ES&H concerns. The ES&H Committee is chaired by the Division Safety Coordinator and is composed of representatives from different departments.

The Engineering Division is responsible for the following buildings: 25 complex, 29 complex, 40, 41, 44B, 46 complex, 77 complex and 81. In addition, they occupy labs, shops, etc. in the following buildings: 2, 10, 31, 58, 70, 70A, 71 complex and 74.

PERFORMANCE EXPECTATIONS AND OBJECTIVES

Research Program Management Responsibility for Safety

Line management is responsible for the protection of the public, the workers, and the environment.

At the Berkeley Laboratory, the following documents establish the policy and provide the implementation guidance that makes line management effectively accountable for protection of workers, the public, and the environment:

- Operating and Assurance Plan, PUB-3111 (1996),
- Self-Assessment Manual, PUB-5344 (1996)
- Environment Health and Safety Manual, PUB-3000 (1995)
- Chemical Hygiene and Safety Plan, PUB-5341 (1992)
- Waste Generator Guidelines, PUB-3092 (1996)
- Employee Performance/Progress Review (Section III), RPM PUB-201 (1996)

Clear Roles and Responsibilities

Clear and unambiguous lines of authority and responsibility for ensuring safety are established and maintained at all organizational levels within the department as well as with its contractors.

Each division making up the Berkeley Laboratory has clearly defined lines of responsibility down to the working level. Each division designates a research investigator to represent its views and concerns on the Laboratory Safety Review Committee and a full-time employee to act as the ES&H Coordinator. This Coordinator acts as the interface between ES&H concerns and compliance in the workplace and the EH&S technical professionals. Organizational information is updated every 60 days and is retained in the Functional/Facility Notebooks as appropriate (see OAP).

Competence Commensurate with Responsibilities

It is assumed that personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

Job assignments, including hires, are reviewed by line management and by the compensation group within Human Resources to ensure that the requirements and responsibilities of a job are matched by the experience, knowledge and skills of individuals selected for assignment. A performance expectation for managers and supervisors in the Engineering Division is how well the talents, knowledge and skills of staff are matched to work assignments and responsibilities.

The Laboratory's training program ensures that each staff member, including participating guests, is adequately trained to participate safely in Laboratory activities. Staff, with supervisor participation, fill out the Jobs Hazards Questionnaire (JHQ) describing the hazards associated with their job assignment and work area. Evaluation of the responses by the Training Coordinator and the cognizant supervisor determines the training regimen needed to carry out work in a manner that protects the employee, co-workers, the public, and the environment.

Balanced Priorities

Resources are effectively allocated to address safety, programmatic, and operational considerations. Protecting workers, the public, and the environment is a priority whenever activities are planned and performed.

All environment, safety and health activities in the Laboratory are described in technical terms with budgetary information included. Each year this information is updated, reviewed and prioritized on the basis of risk to workers, public, and the environment by a Laboratory-wide committee selected to represent programmatic line management and ES&H professionals. This document is utilized by Laboratory Senior Management in strategically planning the immediate focus and long-term goals of the environment, safety and health program at the Laboratory.

Hazard Controls Tailored to Work Being Performed

Administrative and engineering controls to prevent and mitigate hazards are tailored to the work and associated hazards being performed.

Chapter 6 of the Environment, Health and Safety Manual clearly defines the steps for each line manager to develop the appropriate engineering and administrative controls to mitigate hazards in the workplace. The Laboratory's Self-Assessment Program, including Functional Appraisals by ES&H professionals, and the UC/DOE Contract 98 Performance Measures provide assurance that implementation of hazards control is adequate to protect workers, the public, and the environment.

Identification of Safety Standards and Requirements

Before work is performed, the associated hazards are evaluated and an agreed-upon set of safety standards and requirements is established, which, if properly implemented, provides adequate assurance that workers, the public, and the environment are protected from adverse consequences.

The Laboratory is dedicated to following the Necessary and Sufficient Closure Process (DOE 450.3) on an iterative basis at all levels of activities in the Laboratory to ensure that Safety Standards are adequate to provide protection to workers, the public and the environment. This process is completed by reevaluation of work in those situations where current work is

significantly modified, new work is proposed, or substantial facility modifications are being made (Chapter 6, Environment Health and Safety Manual).

Operations Authorization

The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed-upon.

Conditions and requirements for facilities determined to be of higher risk based on the Preliminary Hazards Analysis are contained in a Safety Analysis Document. Activity Hazard Documents are the basis for meeting this requirement for specific operations and activities falling into the higher risk category at the Berkeley Laboratory. Internal agreements describing the performance expectations by each party are used for operations between two functional areas where the quality of performance might adversely impact the Laboratory's ability to meet its responsibility to protect workers, the public, and the environment.

ACTIONS TO BE PERFORMED

The primary mission of the Engineering Division is to provide engineering and technical expertise to support Berkeley Laboratory's research and development programs. This is accomplished by:

- Matrixing professional engineers and technicians directly to research divisions to work as contributing members of research and development projects.
- Developing and sustaining specialized design tools and capabilities, such as CAD/CAE/CAM and custom integrated circuit design, to support the professional design staff.
- Maintaining electronic and mechanical shop facilities to support design development. In addition, the Engineering Division also conducts independent applied research and development programs in areas related to its engineering competencies.
- The Engineering Division also offers opportunities for practical training to both undergraduate and graduate engineering students in the form of summer, 6-month co-op, and 1 to 2 year internships.

PHYSICAL CONDITIONS WITHIN WHICH THE WORK WILL BE PERFORMED

The Engineering Division is responsible for the following buildings: 25 complex, 29 complex, 40, 41, 44B, 46 complex, 77 complex and 81. In addition, they occupy labs, shops, etc. in the following buildings: 2, 10, 31, 58, 70,70A, 71 complex and 74.

The types of rooms this division occupies vary widely, ranging from offices and assembly shops to research labs, machine shops, and plating facilities.

MATERIALS AND CONDITIONS THAT COULD CAUSE ADVERSE CONSEQUENCES

Electronic Type Laboratories

These types of laboratories are found in Buildings 7, 25A, 29, 40, 41, 70/263, 70A/2212, and 70A/4475. They are typically used to design, assemble, and test various types of electronic equipment.

Chemical/Inerts: Generally small quantities of cleaning type solvents such as ethyl alcohol and acetone. Some cryogens and inert gases may also used, though the quantities are also small. Hazards associated with these materials are low because of the small quantities and proper storage facilities (e.g., flammable storage cabinets) that are available).

Electrical: Electrical shock is perhaps one of the greater hazards in these types of laboratories. To reduce this risk, employees attend electrical safety classes, including LOTO.

Sealed Sources: A few of these laboratories have sealed radioactive sources. They are stored in locked cabinets, logs of their use are kept, and all users have dosimeters.

Building 25 (East Side)

This area contains a machine shop, plastics shop, optics lab, and a vacuum coating lab.

Chemical/Inerts: Generally, small quantities of cleaning type solvents such as ethyl alcohol and acetone are used in the machine shop. The vacuum coating lab has a wide variety of carcinogens, corrosives, flammable, reactive and toxic chemicals, generally in small quantities. Some cryogens and inert gases are also used, principally in the vacuum coating lab to backfill vacuum equipment. The optics lab has hydrofluoric acid and xylene. Hazards associated with these materials are low, because there are proper storage cabinets, ventilated work stations, and the employees using these chemicals are aware of the hazards and trained in proper handling procedures.

Radiation: There is one X-ray machine in the vacuum coating lab. It has a X-ray safety document.

Vacuum Equipmentt: There are two large vacuum vessels in the vacuum coating lab, and one in the plastic shop. High voltage electrical power is used in the vacuum coating lab's vacuum oven.

Machine Shop (Building 70A, Rooms 2245, 2253 Area)

Mechanical hazards from moving machinery is perhaps one of the greater hazards in this area. Guards have been installed on all machines, and shop training is given by the shop manager. There is one bridge crane, and all crane operators are certified. There is also a brazing/welding area equipped with an oxygen/acetylene torch.

Chemical: Generally small quantities of cleaning type solvents such as ethyl alcohol and acetone for wipe cleaning. The brazing/welding area has corrosives, such as brite dip and nitric acid, which are used to clean metals. Hazards associated with these material are low because of the small quantities and proper storage (e.g., flammable storage cabinets) facilities that are available.

Laser Fluorescence Experiments (Building 70A, Room 2203)

This laboratory has two 3b lasers. A Laser safety document has been written and approved for this area. A small quantity of epoxies, cleaning solvents, and inert gases (i.e., argon, nitrogen) are used in this area.

Sealed Sources: There are a few radioactive sources in this area. They are stored in a locked cabinet, a log is kept of their use, and all users have dosimeters.

Volcano Field Ionizer (Building 70A, Rooms 2263 and 2263A)

This laboratory has one 3b laser and a Class 2 laser for alignment purposes. A laser safety document has been written and approved for this area.

Chemical Inerts: This laboratory has an extensive inventory of different types of carcinogens, corrosives, flammable and toxic chemicals. Inert gases, such as argon, nitrogen, and helium are also used.

Gas Cylinder Storage (Building 81)

This is an "open air" building that contains inert compressed gases, such as helium and nitrogen. These gases are delivered to different locations at the Berkeley Lab. The primary hazard here involves and transportation of heavy gas cylinders and tanks.

Photo Fabrication Shop (Building 25, Rooms 132, 140, 145, 150, 174, 174 A, B, C)

Chemical Inerts: This area contains some flammable liquids (primarily for wipe cleaning), large quantities of various types of corrosives, and various types of toxic material and carcinogens. To mitigate hazards, employees are extensively trained and these materials are used in tanks equipped with local exhaust ventilation. An AHD describing safety systems, spill procedures, and the waste treatment unit has been written and approved for this area.

Environmental: There is a permitted wastewater treatment unit in this area for the treatment of corrosives and metals. In addition, this area contains a Waste Accumulation Area (WAA) and several Satellite Accumulation Areas (SAAs).

Instrument Support Laboratory (Building 70A, 3rd floor)

Chemical/Inerts: This area uses various types of corrosives, chlorinated solvents, flammables, and carcinogens, as well as lesser amounts of reactives, toxic and highly toxic materials, and hazardous gases. To mitigate these hazards there are ventilated work stations, equipment specific local exhaust systems, and a toxic gas alarm system. There is an AHD for the Ion Implanter. In addition, Building 70A is equipped with emergency standby power and a permitted acid waste neutralization system, both of which are maintained by Facilities.

Environmental: There are seven SAAs in this area, they were all found to be in compliance.

Sealed Sources: There are radioactive sources in this area. They are stored in a locked cabinet, a log is kept of their use, and all users have dosimeters.

Sheetmetal and Weld Shops (Building 77, Rooms 107 and 108)

Chemical/Inerts: These areas use small amounts of flammable liquids such as acetone and isopropyl alcohol for wipe cleaning. Acetylene and oxygen are piped in from cylinders that are located outside of the building. The sheet metal shop has a small amount of corrosives (i.e., hydrochloric acid) that are used for cleaning metal prior to soldering.

Both shops perform different types of welding (in the shop and field locations); consequently, there is acetylene, oxygen and various types of inert gases in these areas. During the welding process, various toxic fumes and gases are generated [e.g., nickel, chromium and lead fumes (from paint), as well as nitrous oxides and ozone], depending on the type of welding and metals involved. Risk associated with these materials are low because both shops have fixed and portable local exhaust ventilation systems, as well as trained personnel who are familiar with respiratory protection and are enrolled in a medical surveillance program.

Various types of shop equipment are also found in these areas, such as shears and brakes. Cranes are used in both of these shops, and all crane operators are certified. Work takes place both in the field and the shop, and can involve working from ladders and elevated platforms. There is a high incident rate of back injuries and strains/sprains for employees in these areas.

Machine and Assembly Shops (Building 77, Rooms 123–158 [excluding Room 156] Building 77A)

There is a large amount of machinery within the Machined & Assembly Shops, and mechanical hazards are perhaps one of the greater hazards in this area. There is an active machine guarding program in the Engineering Division. Most of the rooms in Building 77 have bridge cranes, and all crane operators are certified.

Chemical/Inerts: This area contains small amounts of flammable liquids that are used primarily for wipe cleaning, as well as acetylene and inert gases. There are large amounts of lubricants, such as oils and grease. One room (141) has a small amount of sodium hydroxide.

Paint Shop (Building 77, Rooms 165, 165 A&B)

Chemical/Inerts: This area contains flammable liquids, such as paints and solvents, that are stored in flammable liquid lockers. The powder coating process, which does not involve the use of solvents or thinners, is used for most work in this shop. Room 165B contains a large, walk-in oven which is part of the powder coating process. There is a large, ventilated paint spray booth for spray painting as well as a sandblast room (Room 165A) that is used for cleaning metal surfaces. Both the paint booth and the sandblast room areas are equipped with supplied air respirators and a breathing air system.

Environmental: In addition to a SAA there are two BAAQMD permitted sources: the paint spray booth and the sandblast room.

Ultra-High Vacuum Cleaning Facility (Building 77, Room 156)

Chemical/Inerts: This area contains large quantities of various types of corrosives, and smaller amounts of toxic material and carcinogens, such as nickel sulfate and fluoboric acid. There are no flammable gases, and flammable liquid use is minimal, with small amounts being used occasionally for wipe cleaning. This shop has a permitted vapor degreaser which contains 1,1,1-trichloroethane. To mitigate hazards, employees are extensively trained and these materials are used in tanks equipped with local exhaust ventilation. In addition, there is a toxic gas sensor for hydrogen chloride, an emergency standby power system, and the vapor degreaser has

refrigeration coils to cool the vapors. An AHD describing safety systems, spill procedures, and the waste treatment unit has been written and approved for this area.

Compressed gases consist of small amount of dry nitrogen and house air, which are generally used to clean parts. Rotating equipment consists of a buffer and the limited use of small power tools, such as a grinder and electric drill.

Environmental: There is a WAA, a SAA, and a permitted wastewater treatment (for corrosives and metals) unit in this area.

Glass and Ceramic Shops (Building 77, Rooms 244, 244 A, B, C, D, E)

Chemical/Inerts The glass shop occasionally uses corrosives, such as nitric and hydrofluoric acids and potassium hydroxide. A variety of inert gases are also used in this shop.

Flammables: This area contains large quantities of flammable gases, primarily hydrogen. To mitigate this hazard, there is a flammable gas detection system and the hydrogen cylinders are stored in a secured, well-ventilated area outside the building. Flammable liquids that are used in this area are stored in a flammable liquid storage cabinet.

Various types of ovens and rotating equipment are used in these areas, such as glass blowing lathes, stationary belt sanders, and rotating polishing tables. Each glassblowing lathe is equipped with a local exhaust ventilation system.

Divisionwide

Environmental: Virtually all of the above "functional" groups contain one or more SAAs, all of which were found to be in 100% compliance during this review. Before a new or modified research or construction project is implemented, the division checks to ensure that all NEPA/CEQA requirements are met.

Ergonomic hazards associated with the use of computers are the most common hazard in office areas of this division. Employees are encouraged to have their workstations evaluated and the proper chairs and keyboards accessories purchased.

UNCERTAINTIES ABOUT THE WORK

Because the primary mission of the Engineering Division is to support the research of other divisions, the type of specific work product is often changing. For example, in the Building 77 complex the STAR TPC project is nearing completion, while B-factory project components are starting to be assembled and tested. The changing nature of the work creates challenges in areas such as employee training and hazards control.

RESOURCE AVAILABILITY AND CONSTRAINTS

No significant changes in Engineering Division resources devoted to EH&S activities are planned.

Representatives of Engineering (Curtis Nunnally and Don Rondeau) offered the following evaluation of the EH&S Division past and future resources and support:

- The need for EH&S resources and support for the coming year should be the same as last year.
- Engineering Division is satisfied with EH&S support during the past year.
- Engineering Division is confident that EH&S will meet its needs in the coming year.
- Suggestions for improvements: None at this time.

STAKEHOLDER CONCERNS

There are no stakeholder concerns unique to Engineering Division, which has managed, controlled, and permitted (as required) air, water, hazardous, and solid waste streams.

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Environment, Safety, and Health

INTEGRATED HAZARD APPRAISAL

of

BERKELEY LAB

ENVIRONMENT, HEALTH AND SAFETY DIVISION

1996

for
Work Definition and Hazards Identification

EH&S Division - 1996 IFA Final Report

Organization and Management

The LBNL Environment, Health and Safety Division's primary mission is to provide professional and technical expertise to support and enhance the Laboratory's research and development program.

The EH&S Division is organized into departments and groups to align closely with Laboratory organizational structure. There are two departments, each representing a major service function: Field Support and Services. Reporting to these departments are seven groups. A division administrator, matrixed to EH&S from the Office of the Associate Laboratory Director, Administration, is charged with overall fiscal and personnel management within the division.

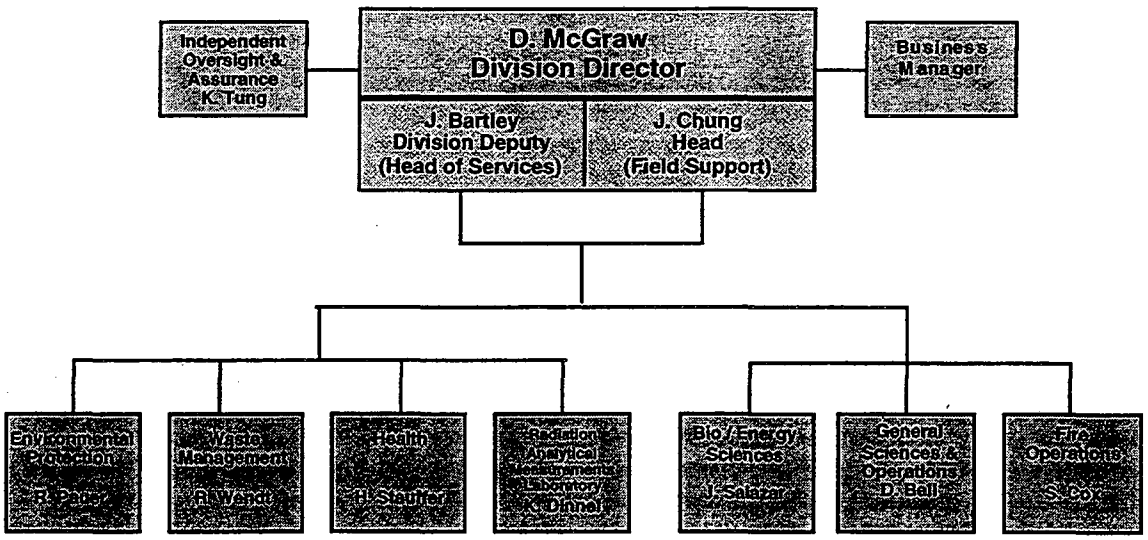
Reporting to the division director, each department head has leadership responsibility for a major functional unit, including three or four subordinate group leaders, plus professionals and technical staff, varying in number from 30 to 50 individuals. Each department head is responsible for management of the department, including planning, staffing, and budgeting, and for the development and implementation of Laboratory policies and procedures in their functional area. Each department head represents the department in contacts with internal and external organizations and individuals on matters of major significance to the success of Laboratory programs and activities. The department head directs the work of subordinate managers in the groups within the department.

Reporting to the division director or a department head, each group leader has supervisory responsibility for an EH&S technical or professional section, project, or function. An EH&S group is comprised of several professionals and/or technical experts (typically 10 to 25 people), organized to achieve goals in a specific, focused EH&S specialty area.

David McGraw is the LBNL EH&S Division Director. He is responsible for the day-to-day operations that articulate Lab policies on protection of the public and the environment, and eliminate potential compliance exposures to the lab. The EH&S divisional charter provides a roadmap for the rest of the division and is found in the Division Function Notebook.

The division organizational structure is shown below.

Environment, Health & Safety Division



6/3/96

Performance Expectation and Objectives

1) Research Program Management Responsibility for Safety _.

At the Berkeley Laboratory the following documents establish the policy and provide the implementation guidance that line management is effectively accountable for protection of workers, the public, and the environment:

Operations Assurance Plan (OAP) - 1996

Self-Assessment Manual - 1992

Supplement - 1996

Publication 3000 - Environment Health and Safety Manual - 1995

Chemical Hygiene and Safety Plan - 1992

Waste Generator Guidelines - 1996

Employee Performance/Progress Review (Section III) - 1996

2) Clear Roles and Responsibilities _.

Each division making up the Berkeley Laboratory has clearly defined lines of responsibility down to the working level. Each division designates a research investigator to represent its views and concerns on the Laboratory Safety Review Committee and a full-time employee to act as the ES&H Coordinator. This coordinator acts as the interface between ES&H concerns and compliance in the workplace and the EH&S technical professionals. The organizational information is updated every 60 days and is retained in the Functional/ Facility Notebooks as appropriate (see OAP).

3) Competence Commensurate with Responsibilities _.

Job assignments, including hires, are reviewed by line management and by the compensation group within Human Resources to ensure that the requirements and responsibilities of a job are matched by the experience, knowledge and skills of individuals selected for assignment. A performance expectation for managers and supervisors in the Division of Environment, Health and Safety is that the talents, knowledge and skills of staff should be matched to work assignments and responsibilities.

The Laboratory's training program ensures that each staff member, including participating guests, is adequately trained to do participate safely in Laboratory activities. Staff, with supervisor participation, fill out the Jobs Hazards Questionnaire (JHQ) describing the hazards associated with their job assignment and work area. Evaluation of the responses by the Training Coordinator and the cognizant supervisor determines the training regimen needed to carry out work in a manner that protects the employee, co-workers, the public, and the environment.

4) Balanced Priorities _.

All environment, safety, and health activities in the Laboratory are described in technical terms with budgetary information included. Each year this information is updated, reviewed, and prioritized on the basis of risk to workers, the public, and the environment by a Laboratory-wide committee selected to represent programmatic line management and ES&H professionals. This document is utilized by Laboratory senior management in strategically planning the immediate focus and long-term goals of the environment, safety, and health program at the Laboratory.

5) Hazard Controls Tailored to Work Being Performed _.

Chapter 6 of the Environment, Health and Safety Manual clearly defines the steps for each line manager to develop the appropriate engineering and administrative controls to mitigate hazards in the workplace. The Laboratory's Self-Assessment Program, including Functional Appraisals by ES&H professionals, and the UC/DOE Contract 98 Performance Measures provide assurance that implementation of hazards control is adequate to protection the worker, the public, and the environment.

6) Identification of Safety Standards and Requirements _.

The Laboratory is dedicated to following the Necessary and Sufficient Closure Process (DOE 450.3) on an iterative basis at all levels of activities in the Laboratory to ensure the Safety Standards are adequate to provide protection to workers, the public, and the environment. This process is completed by commencement of work in those situations where current work is significantly modified, new work is proposed, or substantial facility modifications are being made (Chapter 6, Environment Health and Safety Manual).

7) Operations Authorization _.

Conditions and requirements for facilities determined to be of higher risk based on the Preliminary Hazards Analysis are contained in a Safety Analysis Document. Activity Hazard Documents are the basis for meeting this requirement for specific operations and activities falling into the higher risk category at the Berkeley Laboratory. Internal Agreements describing the performance expectations by each party are used for operations between two functional areas where the quality of performance might adversely impact the Laboratory's ability to meet its responsibility to protect workers, the public, and the environment.

What Actions Will Be Performed

Divisional Summary: _

All EH&S work activities are closely linked to the division mission and objective. The primary objective of the Environment, Health and Safety (EH&S) Division is to provide professional and technical expertise to support and enhance the Laboratory's research and development program. In addition to this primary mission, the EH&S Division encourages staff to participate in research initiatives in areas related to our core competencies. In carrying out its primary mission, the division is committed to six basic principles:

1. LBNL will provide employees with a safe workplace.

2. LBNL will design and operate facilities and research activities to minimize adverse impact on public health and the environment.

3. LBNL will produce and use only materials that can be disposed of safely and will minimize waste.

4. LBNL will promptly communicate to affected persons the known hazards of our activities and the related methods necessary for safety and health protection.

5. LBNL will use available technology, engineered safeguards, and responsible science to mitigate all significant risks arising from its research and related activities.

6. LBNL will train and develop staff to meet the commitments to a safe workplace and minimal adverse impact on public health and the environment.

The objectives of the division's independent research activities are to:

- Ensure the integrity of human health and safety and the environment in which we operate.
- Maintain a capability that is not currently supported by other Laboratory programs.
- Provide opportunities for staff development.
- Build new competencies that could prove useful to future Laboratory and DOE ES&H programs.
- Support the Laboratory's technology transfer mission.

Industrial Hygiene personnel provide services that target all non-radioactive exposures. They administer the respiratory protection program, the hearing protection program, provide technical support and counsel on personal protection from work place hazards, conduct exposure assessments and measurement (physical and chemical), and investigate and report on OSHA or DOE exposure exceedances.

Occupational Safety personnel provide services that target all concerns relating to physical safety. They administer the lockout tagout, confined space, ergonomics and repetitive motion programs, and investigate and report on OSHA or DOE accidents relating to physical safety (falls, trips, and acute and chronic injury initiators).

The Radiation Protection Group reviews and approves radiation safety procedures to evaluate all projects and activities involving ionizing radiation hazards. Laboratory policy requires that radiation safety controls be specified and implemented according to all applicable DOE Orders, all federal regulations (the regulation that specifies requirements for radiation protection is 10 CFR 835), and the LBL Radiological Control Manual (RCM).

The policy covers all aspects associated with use of, or exposure to, ionizing radiation. It applies to:

- Employees working on- or off-site.
- Contractors working on-site.
- External radiation.
- Internal radiation.
- Transportation and use of radioactive material.
- Release of radioactive or contaminated material on- or off-site.
- Use of radiation-producing equipment.
- Protective equipment and apparel.
- Training.

Radiation assessment and protection programs provide services that articulate the Radiation Safety Policy through

- Permitting processes
- Direct management of the radiological inventory
- Direct management of shipments and receipt or all radioactive material
- Employee/contractor training

The Environmental Protection Group _ mission is to support the EH&S division charter through well-designed programs. Program objectives are to protect the public and the environment from effects of operations conducted at the lab. The Environmental Protection Group will implement programs that are aimed at elimination of Environmental compliance exposures to the lab and articulate all applicable DOE orders. Environmental Restoration, a function of Environmental Protection, is to ensure those risks to human health and the environment from past releases of hazardous materials and/or radioactive materials are either reduced to allowable levels or eliminated.

The environmental protection policy of LBL is to conduct its operations in a manner that preserves the quality of the environment. The LBL Environmental Protection Group is committed to good environmental management of all its potential risks, minimizing risks to the environment and public health, and anticipating and addressing potential environmental problems before they pose a threat to the quality of the environment or the public welfare.

The Waste Management Group mission is to manage in a compliant and cost effective manner all hazardous, mixed and radioactive waste generated in the normal course of meeting all program objectives at LBNL. The LBNL Hazardous Waste Management Group is charged with onsite waste management and ultimate disposition of all hazardous, mixed and radioactive waste in a legally compliant fashion. In this report the term "waste" will be taken to mean Hazardous, mixed and radioactive (i.e. all three types of waste). The Hazardous Waste Management Group is divided into five teams. The Compliance Team, Certification Team, the Budget and Planning Team, Operations and Waste Minimization And Generator Support. In meeting its obligations to the research community Waste Generator Support is a component of waste management and is staffed in part by personnel working for the Field Support Department. Matrixed EH&S workers provide necessary independent liaison between waste management and the generator.

The Waste Management Compliance team assures that all LBL operations and activities involving waste management are performed in a safe, responsible and fully compliant manner. The team meets its mission through the implementation programs that provide necessary administrative services that assure waste management compliance with permits and DOE contractural obligations.
The Waste Management Budget and Planning Team assures that the group has sufficient fiscal resources to adequately meet its overall mission. This team also initiates and maintains process tracking systems necessary for ongoing operational fiscal management.

The Certification team provides the independent review of wastes to assure that they are properly characterized for subsequent handling, storage, treatment, transportation and disposal. This is accomplished through waste analysis and/or reviewing generator

process knowledge.

The compliance team, Budget and Planning Team and Certification Team members are not exposed to hazards associated with direct handling of waste containers. Compliance team members encounter hazards associated with normal office operations such as ergonomic and other hazards of relatively low level safety concerns.
The Waste Minimization and Generator Assistance Team provide field support to operations and the rest of waste management. Generator assistance personnel inspect satellite accumulation areas and waste accumulation areas where there is the potential for exposure to chemical and radioactive hazards.

The Waste Management Operations Team is responsible for collection, transportation, storage, treatment and prepartation for shippment of all LBNL generated waste. Personnel in the latter two teams may be exposed to hazards associated with their normal work acitivites.

The Radiation Analytical Measurements Laboratory _ is responsible for providing radiochemical analytical services, dosimetry services and calibration services for the lab. Radiochemical analytical services include operation and management of labs, equipment and supplies, receipt of samples, employment of radiochemical techniques, and supportive administrative duties. Dosimetry services include distribution and retrieval of personal dosimeters, dosimeter analysis, data management, and supportive administrative functions. Calibration services include operation and management of high and low-level radioactive sources, receipt and calibration of various stationary and movable radiation monitors, and associated data management and supportive administrative operations.

The Medical Services assures that all LBL operations/activities involving Employee Health are performed in a safe, responsible and fully compliant matter. The medical facility and staff are committed to applying proactive and preventative measures toward the maintenance of optimum physical and mental health of LBNL staff.
The Medical Facility is staffed with licensed physicians and nurses and administrative staff. Patients are treated for minor injuries and ailments. Patients with major injuries/ailments are immediately transported to offsite medical facilities. Most medical activities are limited to examinations only.

The Lawrence Berkeley National Laboratory Fire Operation Group _ mission is, to protect employees and property from destruction due to fire and related perils via direct action and coordination of the Fire Services Resources. To best meet its objective, the Fire Department is partitioned into the Operations and Fire Prevention Units.
The Operations Unit is responsible for:

- response to and controlling fires, explosions, and uncontrolled releases of hazardous or radioactive materials
- administration of emergency medical aid, treatment, and transportation to Laboratory personnel and the community
- functioning as the Fire Operations Branch during major emergencies
- development and maintenance of the LBL fire alarm receiving station
- participation in the fire extinguisher maintenance program
- performance of inspections in fire risk areas

The Fire Prevention Unit is responsible for:

- eliminating obvious potential causes of fire and life safety hazards and the identification and application of fire protection standards
- maintaining fire safety of property via the implementation of a periodic inspection program designed to identify and remove or control obvious hazards
- compiling and maintaining an accurate history of the fire potential of each building or facility as well as the total fire potential for the entire Laboratory
- improving fire prevention awareness by all Laboratory occupants
- providing recommendations and establish design requirements for new and existing facilities to achieve an improved risk level of protection.

Physical Conditions Where the Work is Performed

Divisional Summary:

The LBNL EH&S division directorate offices are located in Building 90-1140. This is an office area equipped with computers, desks, files, and other routine office furnishings.

EH&S division personnel occupy offices in the following buildings:

Building	EH&S Function
90	Industrial Hygiene Occupational Safety Division Offices Dosimetry Lab
71	Radiation Assessment
51	Site Restoration
48	Fire Operations Occupational Safety
26	Medical Services Radiochemical Analytical Laboratories Waste Management (Waste Minimization)
75	Environmental Protection Waste Management
75B	Environmental Protection Waste management
76	Radiochemical Analytical Laboratories
14	Site Restoration

17	Environmental Protection Radiation Assessment

Field Support Department personnel and select Services Department personnel may conduct their business in any onsite or Lab-operated offsite location. For instance, Fire Operations personnel will respond to emergencies in any location (as defined above), which may include confined spaces, roofs, radiation areas, areas where there are hazardous materials, and so on.

Industrial Hygiene (IH) _ personnel conduct business in their offices, the IH lab and possibly at all other sitewide, including offsite locations. IH personnel offices are located in buildings 48, 75, 80A (ALS matrix) and 90. The IH lab is located in room 75-109 and the IH storage area is located in 75-112A. There is a chemical hood in 75-109 used for the storage of chemicals and calibration. The storage lockers in 75-112A are not seismically restrained. Sitewide working conditions can vary from office environments that are a low level concern to one of the accelerators, laboratory's or construction areas that are a high level of concern. It should be noted that IH personnel can encounter hazardous off-normal conditions involving physical, chemical or radioactive hazards.

Occupational Safety (OS) personnel conduct business in their offices, and possibly at all other sitewide, including offsite, locations. OS personnel offices are located in Buildings 48 and 90. Sitewide working conditions can vary from office environments that are a low level of concern to laboratories or construction areas that are a high level of concern. It should be noted that OS personnel can encounter hazardous off-normal conditions involving physical, chemical or radioactive hazards.

Radiation Protection personnel offices are located in Building 71 and 75. Storage of radioactive materials is maintained in B70-147A, a tightly controlled access confined space. Shipment and receipt of all radioactive materials is managed in B75-123. As building 71 is the site of the former Bevatron, there is a motorized crane and hoist present in the building. This is not used in normal daily operations. B71 cave H is the holding area for radioactive material and equipment that is to be characterized and released as waste or is being held to decay. Items held for decay are logged, held for 10 half lives, and are released back to an RMA for use. All material is stored in a designated holding area and logged on an inventory sheet.

Radiation assessment personnel provide services onsite and offsite at all locations where there may be direct and indirect radiation and other hazards present. They may encounter any of the list of hazards found in the attached work sheet providing emergency response.

All Environmental Protection _ personnel are housed in buildings 75 and 75B. Environmental monitoring equipment is stored in 75D. The EP workshop is located in Building 17.
All EP personnel housed in building 75B occupy typical office space accommodating computer work stations, desks and files. Building 75B work activities are consistent with a normal office environment. There is a small kitchen furnished with a microwave oven, toaster, refrigerator (for storage of food only), and sink. There is a copy center with a distributed (networked) printer present.
EP personnel working in building 75 occupy cubicles in room 75-124. Cubicle configurations conform to the normal office environment as described above for 75B. Building 75D serves as a storage area for environmental monitoring. Environmental

monitoring personnel access the area two or three times per week. There are two sample refrigerators in this area, used for low-temperature storage of samples. The area is furnished with storage racks, cabinets and a table. No normal day-to-day operations are conducted in this area.
The EP workshop, building 17, is equipped with a full complement of light wood and metal fabrication equipment. There is a hood, used for oxyacetylene brazing. There is a small office space, furnished with routine office equipment and a computer.
Environmental monitoring activities are conducted throughout the site on a daily basis. Air exhaust samplers are located on roof tops, sewer samplers are located in one of two site sewer discharge stations, and most ambient air samplers are located at ground level (one located on the roof of building 69). The setup and operation of monitors may constitute unattended running equipment.
Environmental Restoration (ER) Personnel occupy Buildings 51, 14 and 90. Building 31 is used for equipment storage. There is a groundwater treatment unit located outside Building 7; treated water from this unit drains to the sanitary sewer.
ER personnel occupy typical offices or cubicles in Buildings 51, 14 and 90. Normal office activities include data entry and filing, etc.

Environmental restoration field activities are almost exclusively associated with drilling and development of groundwater monitoring wells and subsequent sampling. There are approximately 120 active wells throughout the site. Other site activities include treatment of groundwater, and soil (surface and subsurface) sampling.

Waste Management personnel occupy offices or cubicles in buildings 75, 75B and 26. These offices and cubicles are furnished with the normal complement of office furniture and equipment such as computer work stations, desks and files. There are no waste handling activites in these areas.

HWHF technicians handle waste in the 75 yard, rooms 75-127, 131A, and 131E, in waste pickup and transportation to the waste yard from onsite and offsite locations, and 69-HW.

There is a forklift that is used to move heavy or large containers within the waste yard. In rooms 75-131A 127 there are chemical fume hoods used for waste treatment and characterization. In room 75-127 there are glove boxes used for high level radioactive and mixed waste characterization and packaging. In room 75-131E there is a walk-in or slot hood used for solidification of liquid wastes.

In building there is a 75A a compactor used for volume reduction of dry waste.
Waste generator support personnel, inspect Waste Accumulation Areas (WAA's) and Satellite Accumulation Areas (SAA's).

Radiation Analytical Measurements Laboratory _:

Radiochemical Analytical labs; Buildings 26 and 76: The radiochemical analytical labs are located in Rooms 26-024, 030, and 032. These are all wet labs where various chemicals are stored and used. All three rooms are equipped with chemical fume hoods. Room 26-032 stores radioactive sources that are used to calibrate monitoring equipment and make standards. In Building 76-129, the counting lab is a dry lab. There are heavy (several thousand pounds) shielded containers for conducting low background radiation measurements. There may be seismic concerns with these containers. The rest of the lab is furnished with computers and other electronic equipment (115v and lower).

Calibration Facility Building 75C: This facility is similar to a dry electronics lab with

computers and electrical measurement equipment present. It is in a small trailer located adjacent to Building 75B, dedicated solely to calibration of stationary and moveable radiation monitors. Movable heaters are used to maintain a constant temperature and a remote mechanical operator is used to raise and lower the source. The part of Building 75B located within 50 feet ofthe trailer is protected by a concrete shielding wall.

Dosimetry Office, Building 90-0026: This is an office area with personal TLD annealing ovens and a small film development area. There is a small amount of potassium hydroxide and other film development chemicals in the film development lab. Access to the lab is via a rotating darkroom door. There is a regular secondary access/egress door to the film development area. The TLD annealing oven is totally automatic in its operation and is equipped with interlocks to prevent access to hot exposed areas. Normal use of these ovens is conducted in normal work hours when the area is attended. This does not constitute an "unattended operation."

Building 71 Cave L and M, Electrical Engineering workshop, Building 71-129: The caves are heavily shielded areas used for storage of high- and low-level sources and other miscellaneous equipment. As the Radiation Assessment Cs-137 Calibration Facility, it serves LBNL as one of the calibration facilities where ionizing radiation detection instrumentation and personnel dosimeters are irradiated and calibrated. The gamma ray sources are contained in either a Shepard Source calibrator or shielded pigs. These areas are controlled by key access to approved personnel only (requires documented training); administrative measures such as log books and other records; and mechanical means such as interlocked access and the use of a remote camera. These are not used for general access and no routine work is performed in these areas.

The electrical engineering workshop, B71-129, is an area that is shared (matrixed) with another division. This area is furnished with work tables, cabinets, and other routine office and dry lab equipment.

Building 1, Donner Lab 1-106, Whole Body Counter: This is a heavily shielded area that is accessed via a hydraulic door.

The medical facility is located in the upper level of building 26 and houses examination rooms, offices, lab, and administrative areas. There is no X-ray or any other potential for radiation exposure at the facility. The lab is used for preparing and preserving routine human biological samples (blood, urine, etc.) for offsite analysis. A small quantity of chemicals with low hazard potential (no known carcinogens, teratogens or mutagens) are used.

The Fire Operations Group is housed in Building 48. This facility serves as the garage for the site ambulance, and fire response vehicles. The building also houses the emergency response control room, the site emergency coordination center and offices for fire operations personnel. There is living space (sleeping quarters, kitchen and small fitness center). The vehicle area is intended for safekeeping of the vehicles; there is no vehicle maintenance performed in this area. ER personnel do maintain fire and other emergency response equipment in this area.

Fire Operations Personnel may respond to any area onsite where there is a fire or other emergency where lives and/or property are endangered.

Materials and Conditions That Could Cause Adverse Consequences

Divisional Summary:

The fundamental nature of work activities relating to the Environment, Health and Safety Division almost assures that Field Support Department and select Service Department professionals and technicians could be exposed to a wide variety of hazards. Most of the hazard level of concern is low, with some medium levels of concern for those individuals directly using hazardous or radioactive materials. The matrix below summarizes key hazards or areas of environmental concern.

EH&S Function	Hazard	Environmental Concern
Industrial Hygiene	Chemical, physical agents, radiation, vehicular safety	none
Occupational Safety	Chemical, physical agents, radiation, vehicular safety	none
Fire Operations	Chemical, physical agents, radiation, vehicular safety, lifting trips falls	Discharge to stormwater drains from sprinkler flushing and emergency response fire water
Hazardous Waste Management	Chemical, physical agents, radiation, vehicular safety	Permitted discharge of radioactive materials to the air; discharge to stormwater drains
Radiation Assessment	Chemical, physical agents, radiation, vehicular safety	Permitted discharge of radioactive materials to the air (Building70-147A)
Radiation and Analytical Measurements	Chemical, physical, radiation	Permitted discharge of radioactive materials to the air (26); discharge to sanitary sewer
Environmental Protection and Site Restoration	Chemical, ergonomic/ repetitive motion, vehicular safety, natural hazards, lifting, trips and falls	Groundwater treatment; discharge of treated water to the sanitary sewer; well permits
Medical Services	Ergonomic, repetitive motion	None

As Industrial Hygiene Personnel work practices have the potential to take them to any onsite location and to LBNL operated offsite locations they may be exposed to all hazards identified in the worksheet. Based on the expected hazard encounter frequency the level of concern is low. In the IH lab, IH personnel may be exposed to flammable liquids, corrosives, carcinogens, toxic materials, PUB 3000 defined health hazard gases and oxidizers. The quantities of all these agents is low and therefore the level of concern is low. There is a small battery charger used for recharging portable monitor batteries, the LOC is low. Space heaters are used in the office area, again the LOC is low. There is an SAA in 75-109 and the only equipment containing ozone depleting substances are two

refrigerators, used for food and sample storage (in separate 'fridges). It should be noted that IH personnel may be listed on Radiation Work Authorizations (RWA's) if the work may involve hazardous materials or physical conditions.

Occupational Safety personnel potentially conduct their business in any onsite or LBNL offset location. Consequently, there is the potential for exposure to any of the hazards identified in the attached work sheet. The level of concern for all these hazards is low.

As Radiation Protection personnel provide their services to all onsite and offsite LBNL facilities they may be exposed to a wide variety of chemical, physical and radioactive hazards. Consequently they may be exposed to many of the hazards listed in the attached worksheet.

Currently the radioactive stock in B70-147A is being inventoried. The low LOC chemical hazards in this area are potential exposure to Non-flammable, non-toxic cryogen (LN2), Corrosives, reactive, and reproductive toxins. All radioactive chemicals in 70-147A are present in very small quantities. There is a low LOC potential hazard from exposure to radioactive materials in this area, although all

radioactive materials are stored in type B or equivalent containers and are opened under controlled conditions (glove box). The area air exhaust is constantly sampled for radionuclides.

All radioactive material is received and non-waste is shipped from B75-123. There is the potential for radioactive contamination or release of material. There is a small RMA in this room to hold incoming and outgoing packages for monitoring. The balance of this area is devoted to office or administrative use; the hazards associated with this area are consistent with a normal office environment. A small truck is used to transport radioactive material onsite. There is a low LOC concerning the use of this vehicle and safety.

B71 cave H is the holding area for radioactive material and equipment that is to be characterized and released as waste or is being held to decay. Items held for decay are logged, held for 10 half lives and are released back to an RMA for use. All material is stored in a designated holding area and logged on an inventory sheet. This area is covered by a Class I RWA. While radiation levels are not to exceed 5mR/hr there is an exposure and radiation contamination hazard potential. This is a low LOC.

Environmental Protection _ staff in Buildings 75, 75B and 75D occupy routine office space where there are low-level hazards of concern relating to repetitive motion injury and ergonomic issues. Since 1994 there have been two Workers Compensation claims in this area relating to these issues. The toaster is not heat-protected, and there is a low-level hazard from hot surfaces when this is in use (about once per pay). Environmental monitoring equipment and miscellaneous office furniture is stored in B75D. Storage of some items is unsecured and may pose a seismic hazard. This is a low-level of concern.
Environmental protection monitoring personnel: EP monitoring personnel travel to and from on- and off-site locations, transporting environmental samples, samplers or monitors and maintenance equipment. Approximately 50% of the time spent monitoring is devoted to driving, and of that there is an 80/20% split between on-site and off-site travel respectively. There are low-level hazards associated with vehicular transportation. Many of the samplers are located on roofs. Roof access is via ladder (no cage) where the ladder length is less than 20 ft, but the fall distance is greater than 20 ft (Building 55). Other samplers are located in confined spaces. Storm water samplers are located in areas where there is poor lighting and in remote areas. EP personnel access these areas equipped with a cell phone, however there is a low-level hazard concern that incapacitated personnel would not be able to use the phone.
Some of the samples use hazardous materials. Stack air samples may contain sodium hydroxide (approx. 400ml), a corrosive, or Silica Gel (approx. 250ml), which may pose a respiratory hazard. These hazards are a low-level of concern.
There is no direct radiation exposure hazard potential in the course of the monitors normal daily activities. During roof access of the stack samplers, there is a low-level hazard concern that monitors may be exposed to exhaust air contaminated with radioactivity and/or hazardous chemicals.

Building 17 workshop: Hazards associated with work in this area are related to the use of light metal and wood fabrication activities. There is a spot welder that could cause thermal or arcflash burns; this is a low voltage (12 to 24 volts) high amperage piece of equipment. There is a hood used for brazing, using oxygen and acetylene gases. These are a low level of concern.

There are grinding and sanding machines that are serviced with an exhaust system. The exhaust system is permitted under BAAQMD.

Buildings 51, 14, and 90: Site restoration personnel occupy routine office space, where there are low-level hazards of concern relating to repetitive motion injury and ergonomic issues. There have been no recorded Worker's Compensation cases for this population in the last year.

Site Restoration Field Personnel: Site restoration field personnel are exposed to low-level hazards associated with drilling, developing and sampling groundwater wells. Well drilling poses a noise hazard and other hazards associated with the operation of heavy rotating equipment. Well development and sampling may result in repetitive motion or ergonomic injuries. In the past year there have been two Worker's compensation claims for repetitive injuries. This is a medium level of concern. There is a vehicular hazard potential. There have been a number of minor "fender-benders" over the last couple of years.

During the course of soil investigations or excavations, workers may be exposed to volatile toxic or hazardous chemicals. This is a medium level of concern.
There were 6 out of 40 (15%) SAAR reports attributable to the Environmental Protection Group (5 to site restoration and 1 to EP) from 1994 to present.
In 1995 there was one noise exposure above the OSHA PEL, to a drilling subcontractor.

Waste Management Group:

The following classes of chemicals may be present as waste in the facility at any one time:

Work Activity	LOC
Flammable liquids; such as chlorinated and non chlorinated solvents	Medium
Corrosives: such as mineral and organic acids and bases	Medium
Reactives: such as pyrophoric chemicals	Medium (no exposive materials are held at the HWHF)
Carcinogen: such as benzene	Medium
Highly toxic materials	Medium
Oxidizers: such as hypochlorites	Medium

There is a low level chemical exposure potential in 75-127,131A, 75A and the 75 yard. there is a lowlevel asbestos exposure potential in 75A. There is a low level biohazard potential in 75-131A, 131E, and 75A.
There is a medium level of concern for potential direct and indirect radiation exposure to workers in the 75 yard, 75-131A, 131E, 75A and 75-127. Radioactive material contamination potential exists and all the afformentioned areas.
There is a low level concern of heat stress to workers in the 75 yard.
Waste workers are exposed to ergonomic hazards associated with lifting and moving heavy waste containers. A forklift is used in the waste yard. This is a lowlevel of concern.
In building 75 A drums are stacked in two tiers. This poses a seismic hazard that is of a low level concern. A compactor is used in 75A; there is a low level concern that improper use could result in injury to a worker.

Radiation Analytical Measurements Laboratory:

Radiochemical Analytical labs; Buildings 26 and 76: Rooms 26-024, 030 and 032 are wet labs. These labs contain flammable gases, reproductive toxins, carcinogens, highly toxic materials and oxidizers. As they are present and/or used in small quantities under well-controlled conditions, there is a low level of concern for these materials. There are corrosives as mineral acids and bases; there is a medium level of concern for these materials.

From all the chemical fume hoods in these rooms there is the potential for the release of radionuclides and toxic chemicals to the environment. The release potential for radionuclides triggers periodic stack sampling to satisfy radiological NESHAPs. There is a small waste SAA in the wet lab for small quantity waste management.

In Building 76-129, liquid nitrogen is used to cool certain electrical components. Liquid nitrogen is manually transferred from the storage dewar to the equipment dewar.

In all office areas computers are used for data entry; there is the potential for ergonomic hazards and repetitive motion injury. There is a low-level of concern for these issues.

Samples are transported manually from Building 26 to Building 76. This means that the main road separating the buildings has to be crossed. This can be hazardous, especially during the morning and evening commute hours.

Calibration Facility, Building 75C: No chemicals are used in this facility. The facility possesses a Class 3 Radiological Work Authorization. High level sources are used via a mechanical actuator. The use of high level sources is a moderate level of concern. The actuator is "timed" so that the source is automatically returned to its shielded housing to prevent over exposure to the operator. Portable heaters are used in this area to maintain the air temperature and are a low level concern.

Dosimetry Office, Building 90-0026: A small quantity of potassium hydroxide is used in the film development area. This is a low level of concern. The annealing oven used to develop the TLD personal dosimeters is totally automatic. Interlocks prevent the operator coming into contact with hot surfaces. The balance of this area is office space; there is a low level hazard potential of repetitive motion or ergonomic concern.

Building 71 Cave L and M: The primary hazard is the potential for external radiation exposure. All sources are encapsulated and considered "sealed sources." Almost negligible secondary hazards include potential for internal and external exposures from loose contamination and fire. Facility content material and construction almost eliminate the fire potential.

Matrixed Electrical Engineering workshop Building 71-129: Minor hazards exist from exposed electrical surfaces, and hot surfaces (soldering irons). There is a very low level of concern for toxic chemical exposure from fluxes and lead containing solder. Portable heaters may be used in this area; there is a low level of concern for trip hazards.

Building 1, Donner Lab 1-106, Whole Body Counter: Access and egress from this area is via a hydraulically operated door. There is a small potential for personal injury from the door.

Medical Services : There is a low level hazard potential for ergonomic or repetitive motion injuries in the offices, lobby and administrative areas. There are no SAAR's relating to the medical office area. One SAAR was recorded in October 1995 resulting

from a laceration to the hand of an Occupational Medical Physician. The person was opening a window that was stuck. The window broke and resulting in a laceration. All windows have been repaired and thus negating repetition of this type of injury.
Clinical Lab: Medical technicians take blood samples and prep the samples for transportation and analysis. Taking samples involves handling needles with possibly nervous individuals. There have been no recorded SAAR's of needle sticks to the medical technicians. Small quantities (<1 litre) of organic and mineral acids, mineral bases and flammable chemicals are present in the lab. The clinical lab uses microscopes and a coulter counter to examine blood and urine samples

Examination rooms: The examination rooms are furnished with examination gurneys, a sink, and other routine examination equipment (syphognometer, stethoscope opthalmascope/otoscope). The only activities conducted in these areas are routine physical examinations (audiometer, spirotometer and EKG) and attendance to minor injuries (not requiring stitches) or ailments. There is also a difibulater for use in cardiac emergencies. There is the possibility of an electrical hazard if not used correctly.

Fire Operations personnel engage in the following general activities at the facility:

- Emergency response to fires and releases of hazardous or radioactive materials. Formation of initial Incident Command at all onsite emergencies.
- Emergency response equipment maintenance and readiness testing
- Emergency response equipment readiness training
- Inspection and maintenance of personal protective gear
- Emergency response drills
- Data entry and general office work
- Hydrant flushing; this is a sitewide activity aimed at ensuring hydrant function. (Hydrant water is flushed to the storm drains in both the wet and dry seasons.)

Sufficient Fire Operation response personnel are present 7 days per week 24 hours a day to respond to onsite emergencies. As such, Fire Operations response personnel may be exposed to any of the hazards listed in the attached work sheet. A review of the SAAR report from 1994 to present indicates that the LOC for most of these hazards is low. The SAAR report for the firefighters indicates that most of the injuries are related to physical stress and respiratory distress.

Uncertainties About the Work

There are no programmatic changes anticipated other than those driven by changes in overhead funding level or organizational changes (or in the case of the ALS; ALS funding). Organizational changes are identified by senior line management to better align the EH&S division with the Lab's operational direction. Unknown changes are anticipated resulting from the Necessary and Sufficient Process. There are no known changes to the Federal regulations that would impact this area. Lab programmatic changes include the startup of the new hazardous waste handling facility, the new human genome center, the Biomedical Isotope facility (B55), and NERSC the new supercomputing facility.

Resource Availability and Constraint

There is no significant change for EH&S support for the foreseeable future.

Stakeholder Concerns

There are non-stakeholder concerns relating to the division as a whole. Stakeholder concerns are also associated with the Hazardous Waste Management group, Environmental Protection and Site Restoration, and Fire Operations.

The hazardous waste management facility operates under a RCRA Part B Permit. There are public concerns around current and proposed Hazardous Waste Management practices. These concerns are being addressed in cooperation with the California Department of Toxic Substances Control, the permitting agency, as part of a permit modification. The permit modification seeks to change the number of waste storage and waste treatment options and other minor administrative items.

The National Tritium Labeling Facility is located within the Lab. This NIH-funded facility releases tritium (as HTO) through a continuously monitored stack. Environmental samples taken from local streams have revealed the presence of very low levels of tritium. Local public concern has been raised over the presence of tritium in these streams. The Environmental Group meets with the City of Berkeley and participates in public forums to address these public concerns.

As part of a realignment of Lab Fire Operations, the mutual aid agreement with the City of Berkeley was temporarily suspended. Public concern was raised over the removal of Lab fire suppression support. The mutual aid agreement is currently being renegotiated.

Environment, Safety, and Health

INTEGRATED HAZARD APPRAISAL

of

BERKELEY LAB

LIFE SCIENCES DIVISION

August 16, 1996

for
Work Definition and Hazards Identification

INTRODUCTION

IDENTIFICATION TEAM

Team Member	Technical Specialty
Scott Taylor	LSD Research Representative
Tony Linard	LSD Safety Coordinator
Ken Rivera	Department of Energy Representative
Dave Tudor	LBNL Team Leader, Safety Analysis
Rick Kelly	LBNL Industrial Hygiene
Paul Blodgett	LBNL Industrial Hygiene
Harvey Grasso	DOE Industrial Hygiene
Mike Schoonover	LBNL Radiation Assessment

Other ES&H Contributors	Technical Specialty
Tony Yuen	LBNL Fire Protection
Pat Thorson	LBNL Environmental Protection
Lisa Snow	LBNL Health Services
Tanya Goldman	DOE Waste Management
Edwin Njouko	DOE Radiation Assessment
Tse-She	DOE Safety Review
James Chwang	DOE Fire Protection

Research Contacts	Building
Dan Callahan	74
Jan-Fang Cheng	74
John Conboy	74
Ken Downing	01
Stacy Gauny	70A
Jill Hatier	83
David Knowles	74
Charles Lee	01
Herb Moise	64/74
Ken Myambo	74
Cliff Ng	934
Shraddha Ravani	74
Tamas Torok	70A
Henry VanBrocklin	55
Don Wigington	934

PROJECT TIME-LINE

Date	Activity
6/14/96 – 7/3/96	Collect and Review Information
7/3/96	Establish Organization and Begin Desktop Review
7/12/96 – 8/9/96	Perform Desktop and Field Check Activities
8/16//96	Summary Report

ORGANIZATION AND MANAGEMENT

The Chair of the Life Sciences Division's Environment, Safety & Health (ES&H) Committee reports directly to the Division Director, Mina Bissell, or to the Deputy Head, Aloke Chatterjee. The Chair is Tony Linard, the Safety Officer and Division Safety Coordinator. The committee staff includes a Quality Assurance Officer, a Database Manager, and a Self-Assessment Officer. Committee membership is composed of representatives of Principal Investigators (PIs), staff, and students on a rotating assignment basis. The Division Safety Coordinator (Tony Linard) is charged with oversight of matters pertaining to environment, safety, or health (ES&H). The ES&H Committee meets monthly and provides guidance to the Division Director with regard to ES&H concerns.

The PIs report either directly or through department heads to the Division Director (Mina Bissell), and are accountable for the scientific excellence, relevance to the DOE mission, and fiscal integrity of their programs, as well as for adherence to all administrative and regulatory requirements.

For purposes of this hazard analysis, the activities of the division were grouped into the following organizational units

1. Human Genome Center
2. Subcellular Structure
3. Radiation Biology
4. Cancer Biology
5. Molecular & Nuclear Medicine
6. Functional Imaging
7. Environmental Biotechnology
8. General Support

Operations on the University of California Berkeley (UCB) campus consist of only one activity, computer modeling (located in Barker Hall).

Approximately 10% of the PIs hold faculty positions.

PERFORMANCE EXPECTATIONS AND OBJECTIVES

Research Program Management Responsibility for Safety

Line management (the supervisor or PI) is responsible for the protection of workers, the public, and the environment.

At the Berkeley Laboratory, the following documents establish the policy and provide the implementation guidance that makes line management effectively accountable for protection of workers, the public, and the environment:

- Operations Assurance Plan, OAP (1996)
- Self-Assessment Manual (1992) and Supplement (1996)
- Publication 3000, Environment, Health and Safety Manual (1995)
- Chemical Hygiene and Safety Plan (1992)
- Waste Generator Guidelines (1996)
- Employee Performance/Progress Review, Section III (1996)

Clear Roles and Responsibilities

Clear and unambiguous lines of authority and responsibility for ensuring safety are established and maintained at all organizational levels within the department and its contractors.

Each division making up the Berkeley Laboratory has clearly defined lines of responsibility down to the working level. Each division designates a research investigator to represent its views and concerns on the Laboratory Safety Review Committee and a full-time employee to act as the ES&H Coordinator. This Coordinator acts as the interface between ES&H concerns and compliance in the workplace and the EH&S technical professionals. The organizational information is updated every 60 days and is retained in the Functional/Facility Notebooks as appropriate (see OAP).

Competence Commensurate with Responsibilities

It is assumed that personnel possess the experience, knowledge, skills, and abilities necessary to discharge their responsibilities.

Job assignments, including hires, are reviewed by line management and by the compensation group within Human Resources to ensure that the requirements and responsibilities of a job are matched by the experience, knowledge, and skills of individuals selected for assignment. A performance expectation for managers and supervisors in the Division of Environment, Health and Safety is how well the talents, knowledge and skills of staff are matched to work assignments and responsibilities.

The Laboratory's training program ensures that each staff member, including participating guests, is adequately trained to participate safely in Laboratory activities. Staff, with supervisor participation, fill out the Jobs Hazards Questionnaire (JHQ) describing the hazards associated with their job assignment and work area. Evaluation of the responses by the Training Coordinator and the cognizant supervisor determines the training regimen needed to carry out work in a manner that protects the employee, co-workers, the public, and the environment.

Balanced Priorities

Resources are effectively allocated to address safety, programmatic, and operational considerations. Protecting workers, the public, and the environment is a priority whenever activities are planned and performed.

All environment, safety and health activities in the Laboratory are described in technical terms with budgetary information included. Each year this information is updated, reviewed, and prioritized on the basis of risk to workers, the public, and the environment by a Laboratory-wide committee selected to represent programmatic line management and ES&H professionals. This document is utilized by Laboratory senior management to strategically plan the immediate focus and long-term goals of the environment, safety and health program at the Laboratory.

Hazard Controls Tailored to Work Being Performed

Administrative and engineering controls to prevent and mitigate hazards are tailored to the work and associated hazards being performed.

Chapter 6 of the Environment, Health and Safety Manual clearly defines the steps for each line manager to develop the appropriate engineering and administrative controls to mitigate hazards in the workplace. The Laboratory's Self-Assessment Program, including Functional Appraisals by ES&H professionals, and the UC/DOE Contract 98 Performance Measures provide assurance that implementation of hazards control is adequate to protection the worker, the public, and the environment.

Identification of Safety Standards and Requirements

Before work is performed, the associated hazards are evaluated and an agreed-upon set of safety standards and requirements are established which, if properly implemented, provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.

The Laboratory is dedicated to following the Necessary and Sufficient Closure Process (DOE 450.3) on an iterative basis at all levels of activities in the Laboratory to ensure the Safety Standards are adequate to provide protection to workers, the public, and the environment. This process is completed by commencement of work in those situations where current work is significantly modified, new work is proposed, or substantial facility modifications are being made (Chapter 6, Environment Health and Safety Manual).

Operations Authorization

The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed-upon.

Conditions and requirements for facilities determined to be of higher risk based on the Preliminary Hazards Analysis are contained in a Safety Analysis Document. Activity Hazard Documents are the basis for meeting this requirement for specific operations and activities falling into the higher risk category at the Berkeley Laboratory. Internal Agreements describing the performance expectations by each party are used for operations between two functional areas where the quality of performance might adversely impact the Laboratory's ability to meet its responsibility to protect workers, the public, and the environment.

ACTIONS TO BE PERFORMED

The Life Sciences Division is broadly charged with advancing knowledge of biological processes by investigating mechanisms as intricate as gene expression, and expanding the effort to link biological structure and function. These studies embrace a spectrum of disciplines: molecular cryogenics; cellular differentiation, growth, and carcinogenesis; hematopoiesis; subcellular and macromolecular structure; diagnostic and functional imaging; radiation biology; nuclear and molecular medicine; and the development of bioinstrumentation. The division has established a preeminent position in four specific areas of human disease research: coronary artery disease; the biology of breast cancer; metabolic studies of neurological diseases; and disorders of red blood cell formation.

1. **Human Genome Center:** Research activities include DNA sequencing, genetic mapping, physical mapping, and DNA isolation and analysis.

2. **Subcellular Structure:** Research activities include the study of the molecular structure and subcellular organization of proteins related to the cytoskeleton and various cell membranes through the use of electron crystallography and X-ray crystallography, including electron microscopy, UV-confocal light microscopy, soft X-ray microscopy, and related techniques.

3. **Radiation Biology:** Research activities include the study of the effects of radiation on cells, including radiation-induced cell damage during travel in outer space. Research activities include the study of the regulation and function of oncogenes and tumor suppresser genes in cultured human and rodent cells, and in transgenic mice. Mammary gland biology is studied in culture and in transgenic mice. Rodent and human cells in culture and in vivo are studied. DNA damage, due both to radiation (in natural and occupational environments) and to natural chemicals in the diet, is investigated. The molecular mechanisms of DNA repair and its role in mitigating these risks is also studied.

4. **Cancer Biology:** Research activities include study of the molecular mechanisms of breast cancer including normal cellular growth and differentiation (distinguishing normal human breast cells from their malignant counterparts).

5. **Molecular and Nuclear Medicine:** The goal of this program is the understanding of the role of lipoproteins in the development of atherosclerosis and coronary disease, specifically to study the genetic and cellular mechanisms that regulate their metabolism. Procedures utilized include isotopic tracer studies; human genetic linkage analysis; creation, use and analysis of transgenic animal models; analysis of interaction between oxidative stress, lipoprotein metabolism, and the induction of atherosclerosis; and numerous clinical studies to examine how diet, drugs, exercise and hormones effect the regulation of atherogenic lipoproteins.

6. **Center for Functional Imaging (CFI):** The goal of CFI is to develop the technology and procedures for the non-invasive imaging of humans, and to utilize these techniques to study the physiology of normal and disease states in humans and animals. Activities include the design and construction of positron emission tomography (PET) and nuclear magnetic resonance (MRI) hardware and software; the development and application of new data analysis procedures; the design and synthesis of new radiotracer agents for use in PET and single photon emission computed tomography (SPECT); and the biological testing of these new radiopharmaceuticals and their application in animal and human medical research. The center operates two PET machines, one SPECT machine, two MRI machines, and one biomedical cyclotron.

7. **Environmental Biotechnology:** Research activities consist of microbiology and molecular biology research on materials and organisms that occur naturally in the environment. The Environmental Biotechnology is a multidivisional unit which collaborates with the Earth Sciences Division in research activities.

8. **General Support:** The Life Sciences Division (the LSD) contains an irradiator in Building 74, which is available for use by all departments in the division. LSD personnel oversee the Berkeley Lab Animal Facilities.

PHYSICAL CONDITIONS WITHIN WHICH THE WORK WILL BE PERFORMED

Building 1 (Donner Hall)

Donner Hall is a four-story building located on the University of California, Berkeley, campus. The building consists of laboratory space with adjacent offices. The Life Sciences Division occupies the entire building except for a small portion occupied by the University of California. The following departments have research activities in the building: Molecular & Nuclear Medicine, Subcellular Structure, and Cancer Biology.

Building 29

Life Sciences Division occupies a portion of the second floor. The spaces consist of primarily offices with some computer research.

Building 55 Complex

The Building 55 complex consists of Center for Functional Imaging activities. Building 55 contains laboratories and adjacent offices. Building 55A contains a Nuclear Magnetic Resonance Imaging facility. The trailer (55B) is used for offices and computer research.

Building 56

Building 56 is the Biomedical Isotope Facility and contains a mini-accelerator used for the synthesis of radiopharmaceuticals.

Building 64

B64 is a two-story building with Life Science Division laboratories and offices. The first floor contains laboratories occupied by the Human Genome Center. The second floor contains offices and unoccupied laboratory space, which is currently being modified to contain additional Human Genome Laboratories.

Building 70A

Radiation Biology and Cancer Biology laboratories and offices occupy a portion of the first floor of Building 70A. In addition, a small portion of the fourth floor is occupied by some Radiation Biology and Environmental Biotechnology departments.

Building 74

Building 74 is completely occupied by the Life Sciences Division. The departments include: Radiation Biology, Cancer Biology, and the Human Genome Project. In addition, the building contains an irradiator used by the entire division.

Building 83

Buildings 83 and 83B are occupied completely by the Cancer Biology Department.

Building 934

Building 934 is located off-campus and is occupied completely by the Life Sciences Division. Laboratory and offices areas include Radiation Biology, Cancer Biology, Molecular and Nuclear Medicine, and some equipment used by the Human Genome Center. In addition, one room is managed by the EH&S Waste Management Department.

Building 940

Building 940 is located in the City of Berkeley. It is technically not a part of LBNL, but is leased by Sequoia Hospital District to house the Cholesterol Research medical facility; it is a state-regulated medical facility. The facility includes space used for offices, as well as medical facilities. Radioactive materials and hazardous chemicals are not employed in this building.

MATERIALS AND CONDITIONS THAT COULD CAUSE ADVERSE CONSEQUENCES

GENERAL

The Life Sciences Division (LSD) includes approximately 150 laboratories in which hazardous chemicals are used. Several of the laboratories make use of non-ionizing radiation sources, lasers, cold rooms, magnetic fields and noisy equipment. A number of laboratories use biohazardous agents, including human cell lines, human blood products, and pathogens. Most laboratories perform high voltage or low voltage electrophoresis and centrifugation. Small vacuum systems and compressed gasses are used widely throughout LSD.

Electrical and Mechanical Hazards: A limited array of electrical and mechanical hazards are present in the LSD. These include high voltage electrical systems, repetitive trauma associated with office work, a few small vacuum systems, autoclaves, some pressurized gas systems, belt driven equipment, centrifuges, ovens, and robots.

Electrical Hazards

- The primary electrical hazard associated with LSD is the use of high-voltage electrophoresis equipment. Electrophoresis is found in most laboratories in LSD.
- The overall level of concern associated with high voltage equipment is moderate. This arises because of the exposed connectors and surfaces on electrophoresis equipment.
- High voltage power supplies are also associated with other equipment, such as laser systems.
- There are few high amperage systems in LSD. High current is provided to a couple pieces of equipment, notably the MRI equipment in Building 55A.

Pressure and Vacuum Hazards

- The overall level of concern associated with pressure and vacuum systems in LSD is low.
- The main pressure hazards are the compressed gas cylinders, mostly nitrogen, oxygen, argon, and carbon dioxide.
- There are no significant pressure systems in LSD.
- There are a few glass systems that are filled from a compressed gas cylinder.

- Vacuum systems are limited to small bell jar systems and low vacuum ovens. The ovens often possess glass windows larger than 4 inches in diameter.
- Several buildings are equipped with small-to-moderate-sized steam autoclave systems.

Ovens
- The overall level of concern associated with the use of ovens in LSD is very low.
- Low temperature (<100°C) ovens are widely used in the LSD.

Centrifuges
- The level of concern associated with the use of centrifuges is low in the LSD.
- Dozens of ultracentrifuges and many more small centrifuges are used in the LSD facilities.

Robots
- Mechanical robots, programmed to repeat recurring tasks such as pipetting, are used in several areas in the LSD. The hazard associated with the use of these robots is judged to be low.

Repetitive Mechanical Trauma
- Office operations include the usual array of ergonomic issues, notably those associated with the use of computers and workstations.

***Chemical Hazards*:** A variety of toxic, flammable, corrosive, reactive, or otherwise dangerous chemicals are used in the LSD. In almost all cases, the quantities used at any time are quite small, consistent with typical biochemical laboratory operations. Examples of hazardous chemicals in use in LSD are provided below. None of the LSD facilities use toxic cryogens or flammable cryogens.

Flammable Gases:
- The level of concern relating to the use of flammable gases in the LSD is essentially nil.
- Flammable gases are not widely used in the LSD. Only one cylinder of compressed hydrogen was identified in a single laboratory. Very small cylinders of compressed carbon monoxide are used in several labs.

Flammable Liquids:
- The level of concern associated with the use of flammable liquids in the LSD is low overall.
- Flammable liquids are used throughout the LSD in small quantities.
- Fourteen rooms were identified as having a moderate level of concern associated with flammable liquids, in all cases because of the quantities in storage.
- Typical flammable liquids include ethyl alcohol, isopropyl alcohol, toluene, and acetone.

Inert Cryogens:
- The level of concern associated with the use of inert cryogens is low.
- Liquid nitrogen is used widely in Dewar containers holding up to 160 liters.
- Several labs have Dewar containers directly plumbed to experimental apparatus or equipment.

Corrosives:
- The level of concern associated with the use of corrosives in the LSD is low overall, with eleven labs identified as representing a "moderate" level of concern.
- Most of the LSD laboratories store or use small amounts of corrosive materials.
- Common corrosives include glacial acetic acid, hydrochloric acid, phenol, and sodium hydroxide.

Reactives:
- The level of concern associated with the use of reactives in LSD is low overall, with only two labs identified as representing a moderate level of concern
- Small amounts of reactive chemicals are used in about 30% of the laboratories in the LSD.
- Common reactive chemicals include sodium azide, hydrazine, phosphorous pentachloride, and glacial acetic acid.

Reproductive Toxins:
- The overall level of concern associated with the use of reproductive toxins in the LSD is low.
- No labs were identified with a level of concern of moderate-to-high.
- Common reproductive toxins include lead compounds and toluene.
- Dibromochloropropane and ethylene oxide were identified in a few laboratories.

Carcinogens:
- The overall level of concern associated with the use of carcinogens in the LSD is low.
- Seven labs were identified as representing a moderate level of concern with respect to carcinogens. This was usually triggered by the number of different carcinogens in use rather than a large quantity of any one carcinogen.
- Small quantities of organic carcinogens such as methylene chloride, chloroform, benzene, acrylamide, and carbon tetrachloride are used.
- Similarly, small quantities of inorganic carcinogens such as arsenic, cadmium, lead acetate, and chromium trioxide are used inside hoods.

Pyrophorics:
- The overall level of concern associated with the use of pyrophorics in the LSD is extremely low.
- True pyrophorics were only identified in a few labs, and none of these were pyrophoric gases.

Toxic Materials:
- The overall level of concern associated with the use of toxic and extremely toxic materials in the LSD is low.
- No labs were identified as having a moderate or high level of concern associated with the use or storage of toxic materials.
- Typical inorganic toxic compounds include arsenic compounds, lithium salts, selenium, and antimony.
- Typical organic toxic compounds include methanol, formaldehyde, and phenol.
- Typical highly toxic chemicals include cyanide salts and cholera toxin.

Health Hazard Gases:

- The overall level of concern associated with health hazard gases in the LSD is very low.
- Very few toxic gases are used in the LSD. Toxic gases were only found in three buildings and a total of three lab rooms.
- Toxic gases in use include nitrous oxide, carbon monoxide, fluorine and hydrogen chloride. Only Building 56 uses fluorine. Of these, only nitrous oxide is present in significant quantities.

Oxidizers:

- The overall level of concern associated with the use of oxidizers in the LSD is low.
- No laboratories were identified as having a moderate level of concern associated with oxidizers.
- Approximately 30% of the laboratories store or use oxidizers.
- Typical oxidizers include compressed oxygen, nitric acid, hydrogen peroxide, and bleach.

Physical Agents: Physical agents present in LSD include ultraviolet radiation, cold, lasers, noise, and microwave radiation. Each of these is discussed below.

Ultraviolet Radiation

- The overall level of concern associated with the use of ultraviolet radiation in the LSD is low. Two facilities were identified where the level of concern is judged to be moderate. These are entire rooms which are bathed in UV-B radiation from quartz-mercury lamps.
- Ultraviolet sources are used widely in LSD, both as a germicidal treatment and as an imaging tool for fluorescent molecules.

Radiofrequency/Microwave Radiation

- The overall level of concern associated with the use of radiofrequency/microwave radiation (RF/MW) in the LSD is low.
- The only use of RF/MW besides commercial food-type ovens are two MRI machines in Building 55A.

Cold

- The overall level of concern associated with the use of cold work rooms in the LSD is low.
- Several laboratories have refrigerated rooms in which work is conducted, typically High Performance Liquid Chromatography (HPLC). Some of these are operated at sub-freezing temperatures.

Lasers

- The overall level of concern associated with the use of lasers in the LSD is low.
- Most of the lasers in use are very-low-power units.
- There are only a couple of Class 3 or Class 4 lasers in use.

Noise

- The overall level of concern associated with noise in the LSD is low.
- The primary source of noise exposure is the use of ultrasonic cell disrupters.
- Ear muffs were located at the point of use of all ultrasonicators.

Magnetic Fields

- The overall level of concern associated with the use of magnetic fields in the LSD is very low. Strong DC magnetic fields are present in only two places, where MRI machines are used.

Infectious/Biohazardous Agents: The LSD uses a number of known or potentially biohazardous materials, including human liver and breast cell lines, human blood fractions, animal cell lines, vaccinia virus, malarial agent, and bacteria. Biosafety cabinets are used in several areas within the LSD.

- The overall level of concern associated with the use of these biohazardous agents in the LSD is low.
- None of these operations exceeds Biohazard Level 2.
- Many of the cell lines are pre-screened to exclude common pathogens.
- Personnel that handle unscreened human blood products have generally been provided with the hepatitis B vaccine series.
- Work with the potential to generate infectious aerosols is conducted in either a fume hood or a biosafety cabinet.
- UV lamps are used extensively to sterilize biosafety cabinets and rooms in which biohazardous agents are used.

X-Ray Machines: Five X-ray machines were located. Two are in the Radiation Biology Department (Building 74, Room 152 and Building 70A, Room 1103). One is in the Center for Functional Imaging (Building 55, Room 200). One is in Molecular and Nuclear Medicine (Building 1, Room 305). And one is in Subcellular Structure (Building 1, Room 259c). All are evaluated to be low hazard. The machine in Building 74 is enclosed in a shielded room.

Accelerators and Radiation: The LSD has two types of activities which have radiation hazards. Research and development uses radio-labeled tracers in biochemical research applications. In addition, the LSD has a mini-cyclotron which has direct radiation hazards.

Radio-labeled tracers: Radio-labeled tracers are used in bench-top work using standard biochemical methods. Positron emitters are injected into human patients and animals for Positron Emission Tomography (PET) studies. Quantities used are 1 microcurie to approximately 10 millicuries. Examples include P-32, C-14, H-3 (beta emitters) and F-18 positron (gamma emitter).

Accelerator: The mini-cyclotron is located in Building 56 and is an 11 MeV proton accelerator used to produce positron emitting radioisotopes. The positron emitters are used in shielded gloveboxes for the production of radiopharmaceuticals. The mini-cyclotron is a commercial unit with self-contained shielding and, in addition, is located in a shielded room.

Effluent from research activities and the accelerator is monitored according to NESHAPS requirements.

PROGRAM SPECIFIC FINDINGS
(Chemical, Physical, and Biohazardous Agents)

Mechanical and electrical hazards are very uniform and routine throughout the LSD. The general outline of these safety issues is sufficient to characterize the division. However, there is a wider range and a larger number of chemical, physical and biohazardous agents that are used in the

LSD. Thus, chemical, physical and biohazardous agents will be characterized by operational organization within the LSD.

1. Human Genome Center: The Human Genome Center (HGC) is located in Buildings 64 and 74 with minor support equipment in Building 934.

Chemical Hazards

Flammable Gases:
- There are essentially no compressed flammable gases used in the HGC.

Flammable Liquids:
- The level of concern associated with the use of flammable liquids is low overall.
- No labs were found to pose a moderate level of concern with respect to flammable liquids.
- Flammable liquids are used throughout HGC in smaller quantities.
- Typical flammable liquids include ethyl alcohol, isopropyl alcohol, toluene, and acetone.

Inert Cryogens:
- The level of concern associated with the use of inert cryogens is low.
- Cryogens are used in a number of labs in Buildings 74 and 934.
- Several labs have Dewar containers directly plumbed to experimental apparatus or equipment.

Corrosives:
- The level of concern associated with the use of corrosives in HGC is low overall.
- About a third of the labs use significant amounts of corrosive materials.
- Common corrosives include glacial acetic acid, hydrochloric acid, and sodium hydroxide.

Reactives:
- The level of concern associated with the use of reactives in the HGC is low overall.
- No laboratories were designated as having a moderate level of concern with respect to reactive chemicals.
- Approximately a quarter of the labs in the HGC use significant amounts of reactive chemicals.
- Common reactive chemicals include sodium azide and glacial acetic acid.

Reproductive Toxins:
- The overall level of concern associated with the use of reproductive toxins in the HGC is low.
- No labs were identified with a level of concern of moderate.
- Approximately a quarter of the labs in the HGC use or store reproductive toxins.
- Common reproductive toxins include lead compounds and toluene.

Carcinogens:
- The overall level of concern associated with the use of carcinogens in the HGC is low.
- One lab was designated as posing a moderate level of concern with respect to the use and storage of carcinogens (Building 74, Room 3050). This lab has substantial

quantities of chloroform and formaldehyde, as well as acrylamide, cadmium sulfate and chloramphenicol.
- Small quantities of organic carcinogens such as methylene chloride, formaldehyde, chloroform, and acrylamide are used.
- Similarly, small quantities of inorganic carcinogens such as chrome (IV), cadmium, arsenic compounds, and lead acetate are used.

Pyrophorics:
- The overall level of concern associated with the use of pyrophorics in the HGC is nil.
- There are essentially no pyrophoric materials used in the HGC.

Toxic Materials:
- The overall level of concern associated with the use of toxic and extremely toxic materials in the HGC is low.
- No labs were identified as having a moderate or high level of concern associated with the use or storage of toxic materials.
- Typical inorganic toxic compounds include arsenic compounds, lithium salts, and cadmium compounds.
- Typical organic toxic compounds include methanol, formaldehyde, and ethidium bromide.
- Typical highly toxic chemicals include cyanide salts.

Health Hazard Gases:
- The overall level of concern associated with health hazard gases in the HGC is nil.
- No health hazard gases are used or stored in any significant quantity in the HGC.

Oxidizers:
- The overall level of concern associated with the use of oxidizers in the HGC is extremely low.
- Only one lab was found to use or store significant quantities of oxidizers (nitric acid, Building 64, Room 128). However, several labs used small quantities of bleach.
- Typical oxidizers include nitric acid hydrogen peroxide and bleach.

Physical Agents: Physical agents present in the HGC include ultraviolet radiation, lasers, noise, and microwave radiation. Each of these is discussed below.

Ultraviolet Radiation
- The overall level of concern associated with the use of ultraviolet radiation in the HGC is low.
- Ultraviolet sources are used widely in the HGC, both as a germicidal treatment and as an imaging tool for fluorescent molecules. Only one piece of equipment has been user-modified.

Radiofrequency/Microwave Radiation
- The overall level of concern associated with the use of radiofrequency/microwave radiation in the HGC is extremely low.
- The only use of RF/MW is in commercial food-type ovens, which are used to prepare media. There are no laboratory-type or locally built RF/MW sources.

Lasers

- The overall level of concern associated with the use of lasers in the HGC is very low.
- Only three rooms contain lasers.

Noise

- The overall level of concern associated with noise in the HGC is low.
- The primary source of noise exposure is the use of ultrasonic cell disrupters.
- Ear muffs were located at the point of use of all ultrasonicators.

Infectious/Biohazardous Agents: Biosafety cabinets are not used in this program.

Human Blood/Blood Products

- The level of concern associated with the use of human blood products is very low.
- A couple of labs use human blood products, notably immunoglobulin G. This blood product is screened for major pathogens (HIV, HBV) and processed to remove most other pathogens. However, it is still possible that immunoglobulin products contain pathogenic viruses (e.g., HCV).

Cell Culture (nonpathogenic)

- The level of concern associated with the use of cell cultures in the HGC is very low.
- Cell culture work is limited to the use of non-infected mouse cell lines.

Pathogens

- Pathogenic organisms are not intentionally used in the HGC.

2. SubCellular Structure Program: The Subcellular Structure program (the SS) is located in Building 1 (Donner Hall).

Chemical Hazards

Flammable Gases:

- There are essentially no compressed flammable gases used in the SS.

Flammable Liquids:

- The level of concern associated with the use of flammable liquids is low overall.
- Most of the labs in the SS use very small quantities of flammable liquids.
- No labs were found to pose a moderate level of concern with respect to flammable liquids.
- Typical flammable liquids include ethyl alcohol, hexane, butanol, and acetone.

Inert Cryogens:

- The level of concern associated with the use of inert cryogens is low.
- Cryogens are used in six labs.
- Cryogens are not present in cold traps or piped systems.

Corrosives:

- The level of concern associated with the use of corrosives in the SS is low overall.
- Only a few of the laboratory areas use significant amounts of corrosive materials.
- No laboratories were judged to pose a moderate level of concern with respect to corrosive materials.
- Common corrosives include ammonium hydroxide, calcium hydroxide, hydrobromic acid, and sodium hydroxide.

Reactives:

- The level of concern associated with the use of reactives in the SS is low overall.
- No laboratories were designated as having a moderate to high level of concern with respect to reactive chemicals.
- Only a few labs in the SS use reactive chemicals.
- Common reactive chemicals include various nitrates, hydrazine, and sodium azide.

Reproductive Toxins:

- The overall level of concern associated with the use of reproductive toxins in the SS is low.
- Only a few of the labs in the SS store or use reproductive toxins.
- Common reproductive toxins include sodium bromide, lead compounds, and colchicine.

Carcinogens:

- The overall level of concern associated with the use of carcinogens in the SS is low.
- No labs were identified with a moderate-to-high level of concern.
- Small quantities of organic carcinogens such as benzene, methylene chloride, formaldehyde, chloroform, and acrylamide are used.

Pyrophorics:

- The overall level of concern associated with the use of pyrophorics in the SS is nil.
- Pyrophorics are not used in the SS labs.

Toxic Materials:

- The overall level of concern associated with the use of toxic and extremely toxic materials in the SS is low.
- No labs were identified as having a moderate or high level of concern associated with the use or storage of toxic materials.
- Approximately a quarter of the laboratory areas use or store toxic materials.
- Typical inorganic toxic compounds include phosphorus pentoxide, arsenic compounds, and lithium salts.
- Typical organic toxic compounds include methanol and formaldehyde.
- Typical highly toxic chemicals include cyanide compounds.

Health Hazard Gases:

- The overall level of concern associated with health hazard gases in the SS is nil.
- There are no toxic gases used in any quantity in the SS.

Oxidizers:

- The overall level of concern associated with the use of oxidizers in the SS is low.
- Only a few of the laboratories in the SS store or use oxidizers.
- Typical oxidizers include hydrogen peroxide.

Physical Agents: Physical agents present in the SS include noise and cold. Each of these is discussed below.

Noise

- The overall level of concern associated with exposure to noise is very low.
- Only one room (333) was judged to have a noise concern.

Cold

- The overall level of concern with cold is very low.

The SS operates four work-in cold rooms. Some of these are operated at freezing temperatures.

Infectious/Biohazardous Agents: Biohazardous agents and biosafety cabinets are used in this program. None of the work exceeds Biosafety Level 2.

Human Blood/Blood Products

- The overall level of concern associated with the use of human blood products is nil.

Cell Culture (nonpathogenic)

- Cell cultures are used in the SS.

Pathogens

- The vaccinia virus is used in Room 331.

3. Radiation Biology: Radiation Biology (RB) laboratories are located in Buildings 70A, 74, and 934.

Chemical Hazards

Flammable Gases:

- There are essentially no compressed flammable gases used in RB.

Flammable Liquids:

- The level of concern associated with the use of flammable liquids is low.
- No labs were found to pose a moderate level of concern with respect to flammable liquids.
- Flammable liquids are used throughout RB in smaller quantities.
- Typical flammable liquids include methyl alcohol, ethyl alcohol, isopropyl alcohol, xylene, and acetone.

Inert Cryogens:

- The level of concern associated with the use of inert cryogens is low.
- Cryogens are used in a number of labs in each building.
- There are no cold traps or piped cryogen sources in RB.

Corrosives:

- The level of concern associated with the use of corrosives in RB is low.
- About half of the labs use significant amounts of corrosive materials.
- Common corrosives include bleach, glacial acetic acid, hydrochloric acid, phenol, and sodium hydroxide.

Reactives:

- The level of concern associated with the use of reactives in RB is low.
- No laboratories were designated as having a moderate level of concern with respect to reactive chemicals.
- Common reactive chemicals include sodium azide and glacial acetic acid.

Reproductive Toxins:

- The overall level of concern associated with the use of reproductive toxins in RB is low.
- No labs were identified with a level of concern of moderate.
- Common reproductive toxins include lead compounds, cycloheximide, and toluene.

Carcinogens:

- The overall level of concern associated with the use of carcinogens in RB is low.
- No labs were determined to pose a moderate or high level of concern with respect to the use of carcinogens.
- Small quantities of organic carcinogens such as formaldehyde, chloroform, and acrylamide are used.
- Similarly, small quantities of inorganic carcinogens such as chrome (IV) and arsenic compounds are used.

Pyrophorics:

- The overall level of concern associated with the use of pyrophorics in RB is nil.
- There are essentially no pyrophoric materials used in RB.

Toxic Materials:

- The overall level of concern associated with the use of toxic and extremely toxic materials in RB is low.
- No labs were identified as having a moderate or high level of concern associated with the use or storage of toxic materials.
- Typical inorganic toxic compounds include arsenic compounds, lithium salts, and cadmium compounds.
- Typical organic toxic compounds include methanol, formaldehyde, and ethidium bromide.
- Typical highly toxic chemicals include cyanide salts.

Health Hazard Gases:

- There is no use or storage of health hazard gases in any significant quantity in RB.
- The overall level of concern associated with health hazard gases in RB is nil.

Oxidizers:

- The overall level of concern associated with the use of oxidizers in RB is extremely low.
- Only one lab was found to use or store significant quantities of oxidizers (hydrogen peroxide, nitric acid in Building 74, Room 166). However, several labs used small quantities of bleach and dilute hydrogen peroxide.
- Typical oxidizers include nitric acid, hydrogen peroxide, and bleach.

Physical Agents: Physical agents present in RB include ultraviolet radiation, noise, and microwave radiation. Each of these is discussed below.

Ultraviolet Radiation

- The overall level of concern associated with the use of ultraviolet radiation in the RB is low.
- Ultraviolet sources are used in the RB as an imaging tool for fluorescent molecules.
- There is one user-modified UV unit in use, in Building 934, Room 32.

Noise

- The overall level of concern associated with noise in RB is very low.
- The primary source of noise exposure is the use of several ultrasonic cell disrupters.
- Ear muffs were located at the points of use of the ultrasonicators.

Radiofrequency/Microwave Radiation

- The overall level of concern associated with the use of radiofrequency/microwave radiation in RB is extremely low.
- The only use of RF/MW is in commercial food-type ovens, which are used to prepare media. There are no laboratory-type or locally built RF/MW sources.

Infectious/Biohazardous Agents: Biohazardous agents and biosafety cabinets are used in this program.

Human Blood/Blood Products

- The overall level of concern associated with the use of human blood products is nil.
- Human blood products are not used.

Cell Culture (nonpathogenic)

- The level of concern associated with the use of cell cultures in RB is low to moderate.
- Cell culture work is limited to the use of human cell lines in Building 70A, Rooms 115, 119, and 1121C, and in Building 934. Most of the cell lines are commercial and have been screened for common pathogens.
- Animal cell lines are used in Building 74, Room 166.

Pathogens

- Pathogenic organisms are not intentionally used in RB.

4. Cancer Biology: Cancer biology (CB) laboratory activities are located in Buildings 1, 70A, 74, 83, and 934.

Chemical Hazards

Flammable Gases:
- There are essentially no compressed flammable gases used in CB.

Flammable Liquids:
- The level of concern associated with the use of flammable liquids is low to moderate overall.
- Five labs were found to pose a moderate level of concern with respect to flammable liquids (Building 70A, Room 1105; Building 74, Rooms 265 and 252; Building 934, Room 11; and Building 83, Room 110).
- Typical flammable liquids include methyl alcohol, ethyl alcohol, toluene, and acetone.

Inert Cryogens:
- The level of concern associated with the use of inert cryogens is low.
- Cryogens are used in a number of labs.
- Cold traps or piped cryogen is used in Buildings 83, 70A, and 74.

Corrosives:
- The level of concern associated with the use of corrosives in CB is low overall.
- About half of the labs use significant amounts of corrosive materials.
- In two areas (Building 83, Room 110 and Building 934, Room 11) the use of corrosives was judged to pose a moderate concern.
- Common corrosives include bleach, glacial acetic acid, ammonium hydroxide, hydrochloric acid, sulfuric acid, phenol, and sodium hydroxide.

Reactives:
- The level of concern associated with the use of reactives in CB is low.
- No laboratories were designated as having a moderate level of concern with respect to reactive chemicals.
- Approximately a third of the labs in CB use significant amounts of reactive chemicals.
- Common reactive chemicals include sodium azide and glacial acetic acid.

Reproductive Toxins:
- The overall level of concern associated with the use of reproductive toxins in RB is low.
- No labs were identified with a level of concern of moderate.
- Approximately a quarter of the labs in the CB use or store reproductive toxins.
- Common reproductive toxins include cycloheximide and toluene.

Carcinogens:
- The overall level of concern associated with the use of carcinogens in RB is low.
- One lab (Building 83, Room 110) was determined to pose a moderate level of concern with respect to the use of carcinogens. This lab uses or stores large quantities of chloroform as well as other carcinogens.

- Small quantities of organic carcinogens such as formaldehyde, chloroform, and acrylamide are used in many areas.
- Very little in the way of inorganic carcinogens are used in CB.

Pyrophorics:
- The overall level of concern associated with the use of pyrophorics in CB is nil.
- There are essentially no pyrophoric materials used in CB.

Toxic Materials:
- The overall level of concern associated with the use of toxic and extremely toxic materials in CB is low.
- No labs were identified as having a moderate or high level of concern associated with the use or storage of toxic materials.
- Typical inorganic toxic compounds include cobalt compounds and lithium salts.
- Typical organic toxic compounds include methanol, formaldehyde, and ethidium bromide.
- One lab was identified as storing or using a highly toxic material, a cyanide salt.

Health Hazard Gases:
- There is no use or storage of health hazard gases in any significant quantity in CB.
- The overall level of concern associated with health hazard gases in CB is nil.

Oxidizers:
- The overall level of concern associated with the use of oxidizers in CB is extremely low.
- Typical oxidizers include hydrogen peroxide and bleach.

Physical Agents: Physical agents present in CB include ultraviolet radiation, lasers, radiofrequency/ microwave radiation, and noise. Each of these is discussed below.

Ultraviolet Radiation
- The overall level of concern associated with the use of ultraviolet radiation in the CB is low.
- Ultraviolet sources are used in the CB as an imaging tool for fluorescent molecules.
- Two rooms were identified where there are user-modified UV emitting devices (Building 1, Room 305 and Building 934, Room 38).

Lasers
- The overall level of concern associated with the use of lasers in CB is low.
- Only one significant laser system is present in Building 74, Room 235. This operation is covered by an AHD.

Radiofrequency/Microwave Radiation
- The overall level of concern associated with the use of radiofrequency/microwave radiation in CB is extremely low.
- The only use of RF/MW is in commercial food-type ovens, which are used to prepare media. There are no laboratory type or locally built RF/MW sources.

Noise

- The overall level of concern associated with noise in CB is very low.
- The primary source of noise exposure is the use of an ultrasonic cell disrupters.
- One or more sonicators are present in Buildings 934, 74, and 83.
- Ear muffs were located at the point of use of each ultrasonicator.

Infectious/Biohazardous Agents: Biohazardous agents and biosafety cabinets are used in this program.

Human Blood/Blood Products

- The overall level of concern associated with the use of human blood products is moderate.
- Whole human blood as well as blood fractions are used in the malaria experiments in Building 74, Room 252. Staff has been vaccinated with hepatitis vaccine.

Cell Culture (nonpathogenic)

- The level of concern associated with the use of cell cultures in CB is low.
- Human mammary cells (non-transformed) are used in experiments in Building 934, Room 11. These cells are obtained from reductive mammoplasty surgery and are not screened for pathogens.
- Nonpathogenic E-coli cells are cultured in Building 74, Room 265.
- Work does not exceed Biosafety Level 2.

Pathogens

- The malarial agent, plasmodium cynomologi, is used in Building 74, Room 252.

5. Molecular and Nuclear Medicine: Molecular and Nuclear Medicine (MNM) laboratories are located in Buildings 1 and 934.

Flammable Gases:

- The level of concern relating to the use of flammable gases in MNM is low.
- Only one cylinder of compressed hydrogen was identified in a laboratory (Room 261).

Flammable Liquids:

- The level of concern associated with the use of flammable liquids in MNM is moderate overall.
- Flammable liquids are used throughout MNM in smaller quantities.
- Several rooms were identified as having a moderate level of concern associated with flammable liquids.
- Typical flammable liquids include ethyl alcohol, isopropyl alcohol, hexane, and acetone.

Inert Cryogens:

- The level of concern associated with the use of inert cryogens is low.
- There are no cold traps or cryogens in piping in the MNM.

Corrosives:

- The level of concern associated with the use of corrosives in MNM is low overall.
- No labs were determined to pose a moderate or high level of concern with respect to corrosive chemicals.
- Common corrosives include glacial acetic acid, hydrochloric acid, sulfuric acid, and sodium hydroxide.

Reactives:

- The level of concern associated with the use of reactives in MNM is low overall.
- No labs were judged to pose a moderate or high level of concern with respect to reactive chemicals.
- Common reactive chemicals include osmium tetraoxide, nitrate compounds, sodium azide, and glacial acetic acid.

Reproductive Toxins:

- The overall level of concern associated with the use of reproductive toxins in MNM is low.
- No labs were identified with a level of concern of moderate or high.
- Common reproductive toxins include lead compounds and toluene.

Carcinogens:

- The overall level of concern associated with the use of carcinogens in MNM is low.
- No labs were identified as representing a moderate level of concern with respect to carcinogens.
- Small quantities of organic carcinogens such as methylene chloride, propylene oxide, chloroform, benzene, acrylamide, and ethylene dichloride are used.
- Similarly, small quantities of inorganic carcinogens such as arsenic, lead acetate, and potassium dichromate are used inside hoods.

Pyrophorics:

- The overall level of concern associated with the use of pyrophorics in MNM is nil.

Toxic Materials:

- The overall level of concern associated with the use of toxic and extremely toxic materials in MNM is low.
- No labs were identified as having a moderate or high level of concern associated with the use or storage of toxic materials.
- Typical inorganic toxic compounds include arsenic compounds and lithium salts.
- Typical organic toxic compounds include methanol.
- Typical highly toxic chemicals include cyanide salts.

Health Hazard Gases:

- The overall level of concern associated with health hazard gases in MNM is nil.

Oxidizers:

- The overall level of concern associated with the use of oxidizers in MNM is very low.
- No laboratories were identified as having a moderate level of concern associated with oxidizers.
- Typical oxidizers include sulfuric acid and nitric acid.

Physical Agents: The only physical agents present in MNM are noise (associated with the use of an ultrasonicator in Rooms 260 and 267) and cold (associated with one cold room [Room 117]).

Infectious/Biohazardous Agents: Biohazardous agents and biosafety cabinets are used in the MNM.

- The overall level of concern associated with the use of these biohazardous agents in MNM is low.
- None of these operations exceeds Biohazard Level 2.
- Personnel that handle unscreened human blood products have generally been provided with the hepatitis B vaccine series.
- Work with the potential to generate infectious aerosols is conducted in either a fume hood or a biosafety cabinet.
- UV lamps are used extensively to sterilize biosafety cabinets and rooms in which biohazardous agents are used.

Human Blood/Blood Products

- The overall level of concern associated with the use of human blood products is low.
- Human blood plasma fractions are used in several of the laboratories.

Cell Culture (nonpathogenic)

- The level of concern associated with the use of cell cultures is low.
- A human liver cell line is cultured in Room 373A.
- Work does not exceed Biosafety Level 2.

Pathogens

- No pathogens are intentionally used in the MNM.

6. Center For Functional Imaging: The Center for Functional Imaging (CFI) is located in Buildings 55, 55A, 55C, and 56.

Chemical Hazards

Flammable Gases:

- There are essentially no compressed flammable gases used in the CFI. Several *oxidizing gases,* as discussed in the section on health hazard gases, are in use.

Flammable Liquids:

- The level of concern associated with the use of flammable liquids is low to moderate overall.
- Over 90% of the labs in the CFI use flammable liquids.
- Five labs were found to pose a moderate level of concern with respect to flammable liquids (Building 55, Rooms 127, 135, 151, 208, and 214).
- Typical flammable liquids include ethyl alcohol, hexane, methy ethyl ketone, toluene, dioxane, and acetone.

Inert Cryogens:

- The level of concern associated with the use of inert cryogens is low.
- Cryogens are used in a number of labs but stored on the loading dock.
- Cryogens are present in cold traps or piped systems.

Corrosives:

- The level of concern associated with the use of corrosives in the CFI is low to moderate overall.
- About 90% of the labs use significant amounts of corrosive materials.
- Three laboratories were judged to pose a moderate level of concern with respect to corrosive materials (Building 55, Rooms 151, 208, and 214).
- Common corrosives include ammonium hydroxide, hydroiodic acid, nitric acid, perchloric acid, hydrochloric acid, sulfuric acid, and sodium hydroxide.

Reactives:

- The level of concern associated with the use of reactives in the CFI is moderate overall.
- One laboratory was designated as having a moderate to high level of concern with respect to reactive chemicals. Room 208 in Building 55 stores and uses materials such as potassium superoxide, potassium metal, sodium azide, lithium metal, sodium ethoxide, and sodium peroxide. An AHD covers the safety issues with sodium azide.
- Common reactive chemicals include perchloric acid, potassium t-butoxide, titanium tetrachloride, titanium isopropoxide, lithium aluminum hydride, and sodium azide.

Reproductive Toxins:

- The overall level of concern associated with the use of reproductive toxins in the CFI is low.
- Approximately a third of the labs in the CFI use or store reproductive toxins.
- Common reproductive toxins include lead compounds, carbon disulfide, and toluene.

Carcinogens:

- The overall level of concern associated with the use of carcinogens in the CFI is moderate.
- One lab was identified with a level of concern of moderate to high (Room 214 in Building 55). This room uses or stores relatively large quantities of benzene, ethylene oxide, propylene oxide, ethylene dichloride, and other organic carcinogens.
- Small quantities of organic carcinogens such as benzene, DMF, ethylene oxide, methylene chloride, formaldehyde, chloroform, and acrylamide are used.
- Little in the way of inorganic carcinogens is used in the CFI. Small amounts of cadmium and chromium (IV) compounds can be found in a few laboratories.

Pyrophorics:

- The overall level of concern associated with the use of pyrophorics in the CFI is low.
- Small quantities of air/water reactive alkali metals are used in several labs.

Toxic Materials:

- The overall level of concern associated with the use of toxic and extremely toxic materials in the CFI is low.
- No labs were identified as having a moderate or high level of concern associated with the use or storage of toxic materials.
- Approximately three quarters of the laboratory areas use or store toxic materials.

- Typical inorganic toxic compounds include antimony compounds, phosphorus pentoxide, arsenic compounds, lithium salts, and cadmium compounds.
- Typical organic toxic compounds include carbon disulfide, methanol, formaldehyde.
- Typical highly toxic chemicals include cyanide compounds.

Health Hazard Gases:

- The overall level of concern associated with health hazard gases in the CFI is low.
- The slightly toxic gas nitrous oxide is present in large quantities in Building 55, Room 139. The level of concern associated with toxic gases in this operation is moderate. Minute quantities of bottled carbon monoxide are present in several other areas. Small quantities of ammonia and hydrogen chloride are used in Building 55, Room 151. Fluorine gas is present in Building 56, Room 100.

Oxidizers:

- The overall level of concern associated with the use of oxidizers in the CFI is low.
- Approximately half of the laboratory areas store or use oxidizers.
- Typical oxidizers include hydrazine, nitric acid, and hydrogen peroxide. Fluorine gas, a strong oxidizer, is present in one lab.

Physical Agents: Physical agents present in the CFI include magnetic fields and microwave radiation. Each of these is discussed below.

Radiofrequency/Microwave Radiation

- The overall level of concern associated with the use of radiofrequency/microwave radiation in the CFI is low.
- The only use of RF/MW is in Building 55A, Rooms 102 and 104, where MRI machines are used.

Magnetic Fields

- The overall level of concern with magnetic fields is very low to moderate.
- Magnetic fields are present in Building 55A, Rooms 102 and 104, associated with the magnetic resonance imaging machines. These are strong fields.

Infectious/Biohazardous Agents: Biohazardous agents and biosafety cabinets are used in this program.

Human Blood/Blood Products

- The overall level of concern associated with the use of human blood products is low.
- Rooms 116 and 139 in Building 55 use human blood and blood products. Employees in these areas have been vaccinated for HBV. Other (not specified) non-infectious biological agents are used.

Cell Culture (nonpathogenic)

- Cell cultures are not used in the CFI.

Pathogens

- Pathogenic organisms are not intentionally used in the CFI.

7. Environmental Biotechnology: Laboratories are located on the fourth floor of Building 70A. Activities are assessed to be a low level.

Chemical Hazards

Flammable Gases:
- Hazard level for flammable gases is low. Only one cylinder of hydrogen is used.

Flammable Liquids:
- The level of concern associated with the use of flammable liquids is low.

Reactives:
- The level of concern associated with the use of reactives is nil.

Reproductive Toxins:
- The overall level of concern associated with the use of reproductive toxins is nil.

Carcinogens:
- The overall level of concern associated with the use of carcinogens is low.

Toxic Materials:
- The overall level of concern associated with the use of toxic and extremely toxic materials is low.

Physical Agents: Physical agents present are discussed below. All are low hazard activities.

Equipment:

The program uses the following equipment: a PCR in Room 4461; a gas chromatograph in Room 4462; a DNA synthesizer (Nucleic Acid Synthesis System) and sequencer in Room 4462; and an autoclave in Room 4459. All are low hazard. Compressed gases are located in Room 4462 and include nitrogen, hydrogen, argon, and compressed air. The program also used high voltage electrophoresis located in Rooms 4459 and 4461. A centrifuge is located in Room 4459.

Infectious/Biohazards Agents: Microorganisms occurring in nature are used in the program. A biosafety hood is used and activities are low-hazard.

8. General Support: Building 74 contains an irradiator with a Co^{60} sealed source. The equipment is available for use by all the departments. The overall safety is considered low since a thorough safety assessment (AHD) has been conducted, and written procedures and mechanical interlocks are in place for operation. In addition, LSD operates an animal colony utilized by the entire laboratory. The hazards associated with this colony are considered low.

UNCERTAINTIES ABOUT THE WORK

There are no unique uncertainties which will impact hazard identification and selection of applicable and appropriate standards and requirements.

RESOURCE AVAILABILITY AND CONSTRAINTS

No significant changes in the LSD resources dedicated to ES&H activities are planned.

Representatives of the LSD (Tony Linard, Bob Springsteen, and Scott Taylor) offered the following evaluation of the EH&S Division past and future resources and support:

- The need for EH&S resources and support for the coming year should be roughly the same as last year.
- The LSD judges the EH&S support adequate during the past year.
- The LSD expects that EH&S will meet the LSD needs in the coming year.

The following concerns were raised by the LSD:

- Current DOE requirements which prevent "decay-in-place" of short-lived radioactive materials are not commensurate with the hazard and require unnecessary waste management burdens. If waste standards were more flexible in this regard, the quantity of mixed waste could be reduced substantially, permitting more simple waste disposal requirements for hazardous chemical waste.

The following suggestions for improvement were submitted by the LSD:

- Continued emphasis on improved communication with the EH&S Division's Waste Management Group.
- Continued orientation of the EH&S Division's Field Support Group at bench research activities in order to more thoroughly understand and appreciate the relatively low hazard of most research activities. This should result in addressing safety concerns more efficiently.

STAKEHOLDER CONCERNS

There are no stakeholder concerns unique to the LSD. The LSD has managed, controlled, and permitted (as required) air, water, hazardous, and solid waste streams.

Environment, Safety, and Health

INTEGRATED HAZARD APPRAISAL

of

BERKELEY LAB

MATERIAL SCIENCES DIVISION

August 23, 1996

for
Work and Hazards Identification
to
Define the Necessary and Sufficient Standards Set
and
Direct Appraisal Efforts

INTRODUCTION

This report initially identifies the work activities and hazards that are present in the Ernest Orlando Lawrence Berkeley National Laboratory (Berkeley Lab or LBNL) Material Sciences Division (MSD) as part of the Integrated Hazard Assessment (IHA) process. Activities and hazards were identified in preparation for:

- Definition of the Necessary and Sufficient (N&S), or Work Smart, set of standards, and
- Direction of additional future Environmental Health, and Safety (EH&S) integrated functional appraisals.

In late June 1996, a multi-disciplinary team of research and EH&S representatives from Berkeley Lab, Department of Energy (DOE) Oakland Operations, and Lawrence Livermore National Laboratory (LLNL) was identified (note team listing below). Team members and contributors met six or more times to review available work activity and hazard information, identify hazards related to activities, field-check findings, and complete identification worksheets. Identification worksheet information was then entered into the IHA information management system, and reviewed for quality. Identification worksheets were grouped by MSD-occupied buildings (i.e., Buildings 2, 62, 66, 70, and 72) and according to Principal Investigator (PI) or similar operations. Worksheets are available on the Berkeley Lab website. Building floor plans that show the grouping of MSD operations are presented in attachments to hard-copies of this report (i.e., operations that were grouped together are noted by dots connected by lines).

The body of this report summarizes the IHA team participants, project time-line, MSD organization and management, ES&H performance expectations and objectives, MSD actions to be performed, MSD physical conditions within which the work will be performed, MSD materials and conditions that could cause adverse consequences, uncertainties about the work, EH&S resource availability and constraints, and stakeholder concerns.

INTEGRATED HAZARD ASSESSMENT TEAM

Participant	Technical Specialty
Joel Ager	LBNL MSD Research Representative
Ken Barat	LBNL Laser & X-ray Safety
Steve Black	DOE Environmental Protection
James Chwang	DOE Fire Protection
Russ Ellis	LBNL MSD Safety Coordinator, Building 62 & 66 Manager
Jim Galvin	LBNL MSD Building 2 Manager
Harvey Grasso	DOE Industrial Hygiene
Connie Grondona	LBNL Health Services
Rick Kelly	LLNL Industrial Hygiene
Bruce King	LBNL Team Leader, Industrial Hygiene
Matt Kotowski	LBNL Occupational Safety
Ginny Lackner	LBNL Environmental Protection
Doug Owen	LBNL MSD Building 72 Manager
Phil Roebuck	DOE Basic Energy Sciences Program Representative
Teh Sieh	DOE Seismic & Safety Analysis
Henry Stauffer	LBNL Health Services
Maxwell Yao	LBNL Hazardous Waste Management
Tony Yuen	LBNL Fire Protection

PROJECT TIME-LINE

Date	Activity
6/24/96 – 6/28/96	Collect and Review Information
6/13/96 – 6/28/96	Establish Team Members
6/24/96 – 6/26/96	Identify Operational Grouping
7/02/96 – 7/19/96	Hazards Identification from Available Information
7/08/96 – 7/19/96	Field-Check Hazards Identification
7/10/96 – 7/22/96	Completion and Data Entry of Worksheets
7/30/96 – 7/29/96	Summary Report Draft
7/29/96 – 8/23/96	Summary Report Final

ORGANIZATION AND MANAGEMENT

The Material Sciences Division (MSD) is composed of six scientific units, including:

- Two independent research centers:
  - National Center for Electron Microscopy (NCEM),
  - Center for X-ray Optics (CXRO), and

- Four research areas:
  - Advanced Spectroscopy
  - Materials Chemistry
  - Materials Physics
  - Structural Materials

On-site operations are located primarily in Berkeley Lab Buildings 2, 62, 66, and 72. One operation is located in Building 70, Room 173. NCEM is located in Building 72. CXRO is located in Building 2 on the first and fourth floors. MSD organization charts and building floor plans that note research operation ownership are included in attachments to hard-copies of this report.

Operations on the University of California Berkeley (UCB) campus are primarily in the Chemistry, Physics, and Material Science & Mineral Engineering Departments. Approximately two-thirds of MSD Principal Investigators are also UCB faculty.

Principal Investigators (PI) report either directly through Unit Heads or Center Directors to the Division Director (Daniel Chemla). PIs are accountable for the scientific excellence, relevance to the DOE mission, and fiscal integrity of their programs, as well as adherence to all administrative and regulatory requirements. The Division Safety Coordinator (Russ Ellis) is charged with oversight of matters pertaining to environment, safety, or health (ES&H). The Division Safety Coordinator reports to the Deputy Division Director (Mark Alper) through the MSD Administration group. An ES&H Committee meets periodically and provides guidance to the Division Director with regard to ES&H concerns. The ES&H Committee is chaired by the Division Safety Coordinator and is composed of representatives of PIs, staff, and students on a rotating assignment basis. In addition to Safety Committee members, Program Safety Representatives (about 25) are assigned from each PI group to coordinate ES&H activities for the personnel and operations of each PI. Periodically, a meeting of Safety Representatives is also held to coordinate ES&H needs.

PERFORMANCE EXPECTATIONS AND OBJECTIVES

Research Program Management Responsibility for Safety

Line management is responsible for the protection of the public, the workers, and the environment.

At the Berkeley Laboratory the following documents establish the policy and provide the implementation guidance that makes line management effectively accountable for protection of workers, the public, and the environment:

- Operations Assurance Plan, OAP (1996)
- Self-Assessment Manual (1992) and Supplement (1996)
- Publication 3000, Environment Health and Safety Manual (1995)
- Chemical Hygiene and Safety Plan (1992)
- Waste Generator Guidelines (1996)
- Employee Performance/Progress Review, Section III (1996)

Clear Roles and Responsibilities

Clear and unambiguous lines of authority and responsibility for ensuring safety are established and maintained at all organizational levels within the division and its contractors.

Each division making up the Berkeley Laboratory has clearly defined lines of responsibility down to the working level. Each division designates a research investigator to represent its views and concerns on the Laboratory Safety Review Committee and a full-time employee to act as the ES&H Coordinator. This coordinator acts as the interface between ES&H concerns, compliance in the workplace, and the EH&S technical professionals. Organizational information is updated routinely and is retained in the Functional/Facility Notebooks as appropriate (see OAP).

Competence Commensurate with Responsibilities

Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

Job assignments, including hires, are reviewed by line management and by the compensation group within Human Resources, to ensure that the requirements and responsibilities of a job are matched by the experience, knowledge, and skills of individuals selected for assignment. Performance expectations for managers and supervisors in the division match the talents, knowledge, and skills of staff to work assignments and responsibilities.

The Laboratory's training program ensures that each staff member, including participating guests, is adequately trained to participate safely in Laboratory activities. Staff, with supervisor participation, fill out the Jobs Hazards Questionnaire (JHQ) describing the hazards associated with their job assignment and work area. Evaluation of the responses by the Training Coordinator and the cognizant supervisor determines the training regimen needed to carryout work in a manner that protects the employee, co-workers, the public, and the environment.

Balanced Priorities

Resources are effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment is a priority whenever activities are planned and performed.

All environment, safety, and health activities in the Laboratory are described in technical terms with budgetary information included. Each year this information is updated, reviewed and prioritized on the basis of risk to workers, public, and the environment by a Laboratory-wide committee selected to represent programmatic line management and ES&H professionals. This document is utilized by Laboratory Senior Management in strategically planning the immediate focus and long-term goals of the environment, safety, and health program at the Laboratory.

Hazard Controls Tailored to Work Being Performed

Administrative and engineering controls to prevent and mitigate hazards are tailored to the work and associated hazards being performed.

Chapter 6 of the Environment, Health, and Safety Manual clearly defines the steps for each line manager to develop the appropriate engineering and administrative controls to mitigate hazards in the workplace. The Laboratory's Self-Assessment Program, including Functional Appraisals by ES&H professionals, and the UC/DOE Contract 98 Performance Measures provide assurance that implementation of hazards control is adequate to protect the worker, the public, and the environment.

Identification of Safety Standards and Requirements

Before work is performed, the associated hazards are evaluated and an agreed-upon set of safety standards and requirements are established which, if properly implemented, provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.

The Laboratory is dedicated to following the Necessary and Sufficient Closure Process (DOE 450.3) on an iterative basis at all levels of activities in the Laboratory to ensure the Safety Standards are adequate to provide protection to workers, the public, and the environment. This process is completed by commencement of work in those situations where current work is significantly modified, new work is proposed, or substantial facility modifications are being made (Chapter 6, Environment Health and Safety Manual).

Operations Authorization

The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed-upon.

Conditions and requirements for facilities determined to be of higher risk based on the Integrated Hazards Analysis are contained in a Safety Analysis Document. Activity Hazard Documents are the basis for meeting this requirement for specific operations and activities falling into the higher risk category at the Berkeley Laboratory. Internal Agreements describing the performance expectations by each party are used for operations between two functional areas, where the quality of performance might adversely impact the Laboratory's ability to meet its responsibility to protect workers, the public, and the environment.

ACTIONS TO BE PERFORMED

The Material Sciences Division is broadly charged with conducting basic research in areas of materials sciences consistent with the National Energy Strategy. Activities include the discovery and synthesis of new materials, the characterization of new and existing materials, and the development of theory to explain experimental results and to predict the existence of new advanced materials.

PHYSICAL CONDITIONS WITHIN WHICH THE WORK WILL BE PERFORMED

Building 2 Complex

The Building 2 complex includes Buildings 2 and B2A. Building 2 is a four-story building. Note the attached floor plans of Building 2 MSD operations. All research operations are contained in about 58 single-room labs located primarily in two building cores. These labs have lab hoods for chemical use. In addition, Building 2 has about 118 offices located primarily on the perimeter of the building and a machine shop on the first floor. About one-third of the first floor of Building 2 contains building mechanical and electrical areas which are not potential hazards for MSD personnel. Building B2A is a separate concrete-wall building with only two small rooms designed according to "hazardous occupancy" Code requirements for the storage of hazardous solids/liquids and non-toxic hazardous gases.

Building 62 Complex

The Building 62 complex includes Buildings 62 and B62A. Building 62 is two joined buildings: a three-story lab and office building and a two-story shop building. Note the attached floor plan of Building 62 operations. All research operations are contained in about 31 single-room labs. Only four other labs in the building belong to another division (i.e., Energy & Environment). Chemical-use labs and shops have lab hoods (29) or other local exhaust points (9). In addition, B62 has about 48 offices located primarily on the perimeter of the building. The shop area contains a shop floor and upper mezzanine ("highbay"). A small basement area contains building mechanical equipment which is not potentially hazardous for MSD personnel. Building B62A is a separate trailer that contains about eight offices.

Building 66

Building 66 is a four-story building that contains MSD Center for Advanced Materials (CAM) research programs and division administration offices. Note the attached floor plans of Building 66 operations. All research operations are contained in about 34 single-room labs. These labs have about 27 lab hoods for chemical use. The CAM Biomolecular Materials Program has six wet-chemistry and nuclear magnetic resonance spectroscopy labs. The CAM High Performance Metals Program has nine metallurgical testing labs including darkroom, microscopy and sample preparation, heat-treating furnaces, and mechanical testing. The CAM Surface Science and Catalysis Program has about 13 labs, including 19 ultra-high vacuum chambers, and a laser lab. In addition, Building 66 has about 54 offices. The partial first floor of Building 66 contains building mechanical and electrical areas which are not potential hazards for MSD personnel.

Building 72 Complex

The Building 72 Complex contains the National Center for Electron Microscopy (NCEM). NCEM is a national, user-oriented resource for transmission electron microscopy. Note the attached floor plans of Building 72 operations. NCEM has about seven transmission electron microscopes (TEM). Two of these TEMs are each housed in a three-story silo/building: the High Voltage Electron Microscope (HVEM) is in Building 72A and the Atomic Resolution Microscope (ARM) is in Building 72B. The other TEMs are housed in single rooms. In addition, the NCEM facility has two photographic dark rooms, two wet and dry microscope specimen preparation labs, an optical diffraction room, a small electronic and machine shop, and about 13 offices. Chemical-use areas have lab hoods. The Low Background Counting Facility in room 128 is managed by the Nuclear Science Division.

Building 70

Building 70 only contains one MSD research operation (C. Shank) which is in two laser lab rooms. This operation is planned to be moved in the next six months to the Building 2 third floor as part of the Molecular Design Institute (MDI) space consolidation project. In addition, this operation has several lasers on the Advanced Light Source beamline, which will be covered in the AFRD/ALS Integrated Hazard Analysis.

University of California Berkeley

Operations on the University of California Berkeley (UCB) campus are primarily located in Birge, Etcheverry, Hearst Mining, Hildebrand, Latimer, and Le Conte Halls.

MATERIALS AND CONDITIONS THAT COULD CAUSE ADVERSE CONSEQUENCES

Examples (not summaries) of typical materials and conditions that could cause adverse consequences if not controlled are listed below. These examples are first listed by Necessary and Sufficient requirements identification topic areas, and then by hazard categories. Typical levels of concern are also shown based on the estimated level of control that is implemented or achievable. Levels of concern noted as "moderate" (or "high" in one case) may need additional future evaluation to verify this level of concern and adequacy of controls.

Labs

Chemical Hazards:
Solid, liquid, and gaseous inert and hazardous materials are used typically in smaller quantities throughout many labs and some shops in all MSD-occupied buildings. Hazardous materials include flammable gases, flammable liquids, inert cryogens, corrosives, reactives or explosives, reproductive toxins, carcinogens, pyrophorics, toxic materials, health hazard gases, and oxidizers. Hazardous materials are commonly used inside high-integrity, closed systems (e.g., vacuum chambers and gas systems). Hazardous materials that may become significantly airborne are typically handled inside hoods. Personal protective equipment and administrative procedures are used as needed. Given the level of controls used, the overall level of concern for acute or chronic chemical exposure at any one operation is "low." Examples of hazardous materials uses include:

- Flammable Gases:
  - Many locations use compressed flammable gases in quantities less than two large cylinders (200 cf). Level of concern is "low."
  - Some locations on the 4th floor of Building 66 have more than 200 cf of hydrogen present. Level of concern is "moderate."
  - Atmospheric quartz hydrogen furnaces which are vacuum leak checked (Building 2, Room 260A) are a "moderate" level of concern.

- Flammable Liquids:
  - Flammable liquids are used throughout MSD in smaller quantities and are typically organic solvents.
  - Flammable liquids such as acetone, chlorobenzene, hexane, IPA, MIBK, and octane are used in lithography (Building 2, Room 236)

- Inert Cryogens: Level of concern is "low."
  - Liquid nitrogen is dispensed from a large outside tank into 160L dewars. 160L dewars are rolled to labs (Buildings 62, 66, and 2)
  - Liquid nitrogen is dispensed from 160L dewars into 4L dewars (e.g., electron microscopes).
  - Cold traps are used with vacuum chambers (Building 2-CXRO, Room 102)

- Corrosives:
  - Hydrofluoric acid solution is used in some labs.
  - A wide variety of common corrosives are used throughout various MSD labs.

- Reactives or Explosives:
  - Use of unheated perchloric acid in lab hoods (Building 72, Room 102)
  - Use of highly-reactive, flammable-solid sodium, and lithium metals in inert atmosphere gloveboxes (Building 62, Room 150). Level of concern is "moderate."

- Reproductive Toxins:
  - Laser dye solutions are mixed inside lab hoods.
  - Toluene is used in small quantities for cleaning (Building 62, Room 208). Level of concern is "low."

- Carcinogens:
  - Laser dye solutions are mixed inside lab hoods.
  - Small quantities of chemicals such as methylene chloride, chloroform, benzene, acrylamide, carbon tetrachloride, and chromium trioxide are used inside hoods (B66).

- Toxic and Pyrophoric Materials:
  - Ion implant (Building 2, Room 258) and chemical vapor deposition (Building 2, Room 256) source gases or evaporating liquids have toxic, pyrophoric, carcinogenic, reproductively toxic, reactive, and/or corrosive properties that yield a "moderate" level of concern.

- Health Hazard Gases:
  - Small quantity cylinders of carbon monoxide are dispensed into vacuum chambers (B66).
  - Fluorine gas is used with lasers (Building 2 MDI)

- Oxidizers:
  - Oxidizing acids (e.g., nitric acid) and gases (e.g., oxygen) are commonly used.

Electrical Hazards:
- Transmission electron microscopes (Building 72) contain enclosed high voltage power supplies. Level of concern for contractor maintenance of microscopes is "moderate."
- CXRO (Building 2, 4th floor) has many pieces of equipment with high voltage sources: diffractometers, reflectometers, spectrometers, sputterer, evaporator. Level of concern is "low."
- Repair of electronic equipment greater than 120V occurs periodically in electronic shops (Building 72, Room 112A, Building 2-CXRO, Building 62, Room 155). Level of concern is "low."
- High voltage power supplies on lasers. Level of concern is "low" to "moderate."
- Development and repair of equipment with electrical components (Building 66-2nd floor). Level of concern is "low."
- Ion implanter (Building 2, Room 258) high voltage electrical. Level of concern is "moderate."
- Nanowriter operation (Building 2, Room 115) high voltage concern is "moderate."

Hydraulic Systems:
- Hydraulic systems are used to conduct fatigue testing on materials (Building 62, Rooms 100C, 118, 144, 146; Building 66, Room 310)

Mechanical Equipment:
- Very small material specimens are prepared for microscopy with table-top grinding and cutting equipment. Level of concern is "low."

Lasers:
- The following approximate number of Class 3b or 4 laser labs are present: Building 2 (7), Building 62 (3), Building 66 (1), and Building 70 (1). Lasers are controlled as specified in PUB-3000. Level of concern is "moderate" due to potential for eye injury.
- Medical monitoring includes laser eye exams for laser users.

Non-Ionizing Radiation:
- Strong magnetic fields are noted for the Electron Paramagnetic Resonance (EPR, Building 2, Room 237)) Spectrometer. Magnetic and microwave fields are noted for the Optical Detection of Magnetic Resonance (ODMR, Building 2, Room 237) apparatus. Level of concern is "low."
- RF Sputtering system and Magnetometer (Building 62, Rooms 308 and 312) may have RF and magnetic fields. Level of concern is "low."

Pressure and Vacuum Hazards:
- Small to large cylinders of inert and hazardous gases are used throughout MSD with regulators and appropriate gas system components.
- Small vacuum chambers are common throughout MSD. Vacuum chambers are often back-filled from pressure sources such as gas cylinders or contain windows in excess of four inches.
- ARM tank (Building 72B) is greater than 10 cf and is pumped down annually.
- Pressurized glass apparatus in Building 66, Room 426 needs evaluation. Level of concern is "moderate." Other apparatuses in Building 66, Room 224.

Biological Hazards:
- Biological agents (Class 1 and 2) are only used in Building 66 at one location. No Class 3 or 4 infectious agents are used. Level of concern is very "low."

Ovens and Furnaces
- Furnaces are commonly used. Level of concern generally "low," except for furnaces also using flammable gases.

Unattended Operations
- Research experiments and apparatuses are often run in an unattended mode, especially during the day, but the consequences of failure yields a general "low" level of concern. A few operations yielded a "moderate" level of concern. Generally, more evaluation of this item is needed to identify any potential concerns.

Satellite Accumulation Areas (SAA):
- There are approximately 65 SAAs in MSD. The level of concern is "low."

Facilities

Shop Equipment, Welding/Soldering:
- Rotating and cutting equipment in small machine shop (Building 72, Room 112A)
- Milling, lathing, bead-blasting, braking, hydraulic ramming, solvent cleaning to make parts in one moderate and one small machine shop (Building 2, Rooms 126 and 227).
- Machining, welding and soldering, tensile testing, compressive load-testing, vacuum repair, abrasive blasting, metal forming, and student shop (Building 62, Rooms 101 and 202).
- Isostatic presses (Building 62, Room 142) used for metals forming may have large stored pressure energy. Level of concern is "high." Evaluation needed.

Cranes or Hoists:
- Smaller electron microscopes have manual hoists (Building 72)
- HVEM (Building 72A) and ARM (Building 72B) have six-ton bridge cranes, other hoists, and lifting fixtures on the microscope tanks.
- Manual hoist in Building 66, Room 229

Personnel Falls/Platforms/Lifts:
- Elevated platforms located on top of HVEM (Building 72A) and ARM (Building 72B) tanks.

Confined spaces:
- Van de Graaf tank is a confined space, but level of concern is very "low."

Seismic Hazards:
- Tall and/or valuable lab research equipment is typically secured in labs (e.g., electronic racks).

Noise:
- Beadblaster in Building 2, Room 435D needs evaluation. Level of concern is "low."

Accelerators and Radiation Sources

"X-Ray Machines"

Only four MSD machines have enough potential for X-ray emission to be on the EH&S "X-Ray Machine" list. These machines are:

- Building 2 CXRO Rotating Anode X-ray Diffractometer (Building 2, Room 458),
- Building 2 CXRO Phillips XRG 3100 (Building 2, Room 423), and
- Two X-ray diffractometers (Building 62, Room 145). Film badge monitoring on operators. Level of concern is "moderate."

Incidental X-Ray Sources

X-rays that are incidental to the operation and a "low" level of concern are generated in the following transmission electron microscopy (TEM), spectroscopy, and ion implantation operations:

- TEMs: X-ray hazards from TEMs are blocked by equipment design and chamber walls (Building 72).
- The HVEM (B72A) and ARM (Building 72B), both TEMs, have area monitoring using fixed-in-place film badges and ionization chambers.
- X-ray hazards in x-ray spectroscopy are shielded by the metal vacuum chamber (Building 66, Rooms 430 and 411; Building 2, Rooms 133 and 423).
- XPS (Building 66, Room 207). Level of concern is "low."
- Dosimetry is conducted for incidental X-rays on the ion implanter.

Sealed Sources:

- The EH&S inventory of radiation sealed sources lists only four sealed sources in MSD. These sources are at Building 2, Room 434, X-ray Spectroscopy Lab. Level of concern is "low."

Environment

- EBMUD general site sanitary sewer permit. Level of concern is "moderate."
- EBMUD Building 2 acid waste drain fixed treatment unit and drain system. Level of concern is "moderate."
- Darkroom fixer and developer cannot be poured down drains as specified in EBMUD permit.
- BAAQMD general solvent-wipe permit. Level of concern is "moderate."
- Diesel underground storage tanks at Building 66 (2) and Building 2.
- Ozone Depleting Substances: Transmission electron microscopes have about 0.5 lb. of freon. Small quantities of TCA and carbon tetrachloride are present in various locations.

Core

Repetitive Motion:

- Office work at video display terminals at all locations may lead to cumulative trauma injuries. The level of concern that some injury may occur is estimated to be "moderate." Several cumulative trauma injuries in offices have been reported in MSD in the last year. There are approximately 250 offices in MSD: Building 2 (118), Building 62 (56), Building 66 (54), and Building 72 (13).

Vehicles:

- Some vehicles are non-routinely used by MSD personnel.

UNCERTAINTIES ABOUT THE WORK

There are no unique uncertainties which will impact hazard identification and selection of applicable and appropriate standards and requirements. The following significant changes in MSD facilities will not significantly alter the overall hazards or requirements.

Building 2 Molecular Design Institute (MDI):
The following groups are moving to the third-north floor of Building 2 to form the MDI. The Peter Shultz/Xaio Dong Xiang group will move from UCB Latimer Hall and Building 62, Rooms 242, 310, and 312 to Building 2, Rooms 327, 331, 333, 335, and 355, to do materials synthesis. The Charles Shank group laser lab will move from Building 70, Rooms 173 and 177 to Building 2-third floor. The Paul Alivisatos group will move from UCB campus to Building 2, Rooms 307, 321, and 359 to do nanocrystal synthesis and characterization.

Building 2 Nanofab:
The Building 2 Nanofab phase 1 facility has been constructed on the north-first floor of Building 2. An E-beam nanowriter and small lithography cleanroom is due for startup. Additional phases will develop this facility further in the same area.

Building 62 Bell Group Move:
The Alex Bell group in Building 62, Rooms 316, 320, 338, 342, 344, and 348 is currently moving to UCB campus and will be moved by Fall 1996. Future use of these rooms has not been determined.

Building 72C Electron Microscope Facility Addition:
A small two-story structure is being added onto Building 72C and is scheduled for completion in late 1996. This new structure will have three electron microscope rooms (including two electron microscopes) on the first floor and nine offices on the second floor. Potential hazards associated with the two new microscopes are the same as potential hazards of current transmission electron microscopes in operation in Building 72.

RESOURCE AVAILABILITY AND CONSTRAINTS

No significant changes in MSD resources devoted to ES&H activities are planned.

Representatives of the MSD (Joel Ager and Russ Ellis) offered the following evaluation of the EH&S Division past and future resources and support:
- The need for EH&S resources and support for the coming year should be roughly the same as last year.
- MSD is "highly" satisfied with EH&S support during the past year.
- MSD is "highly" confident that EH&S will meet MSD needs in the coming year.
- No suggestions for improvements were made.

STAKEHOLDER CONCERNS

There are no stakeholder concerns unique to MSD. The Material Sciences Division has managed, controlled, and permitted (as required) air, water, hazardous, and solid waste streams.

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Environment, Safety, and Health

INTEGRATED HAZARD APPRAISAL

of

BERKELEY LAB

NUCLEAR SCIENCE DIVISION

SEPTEMBER 25, 1996

for
Work Definition and Hazards Identification

INTRODUCTION

IDENTIFICATION TEAM

Team Member	Technical Specialty
Roger Kloepping	LBNL Team Leader, Radiation Protection
Janis Dairiki	NSD Research Representative
Wanda Smith Burnett	NSD Safety Coordinator
James Chwang	DOE Representative/Fire Protection
Jack Salazar	LBNL Industrial Hygiene
Tony Yuen	LBNL Fire Protection
Keith Gershon	LBNL Safety
Connie Grondona	LBNL Health Services
Mark Lasartemay	LBNL Waste Management
Ken Barat	LBNL Laser & X-Ray Safety
Henry Tran	LBNL Environmental Protection
Steve Lesell	DOE Environmental Protection

Other ES&H Contributors	Technical Specialty
Rob Connelly	LBNL Industrial Hygiene
Steve Leeds	LLNL Fire Protection
Robert Teets	DOE Radiation Protection
Edwin Njouko	DOE Radiation Protection

Research/NSD Contacts	Building
Janis Dairiki	NSD
Dennis Collins	88
Ruth Mary Larimer	88
Diana Lee	70
Ken Gregorich	70/88

PROJECT TIME-LINE

Date	Activity
7/2/96 -716/96	Collect and Review Information
7/16/96	Establish Organization and Begin Desktop Review
7/16/96 - 8/7/96	Perform Desktop and Field Check Activities
8/30//96	Draft Summary Report

ORGANIZATION AND MANAGEMENT

Organization and Administrative Responsibilities and Authority. The Division Director, who has overall responsibility for all aspects of the Division program, is assisted by the Division Deputy Director, Division Administrator, and scientific program and project heads. Scientific program and project heads report to the Division Director and are responsible for overseeing division

research programs and projects. Senior scientists, program and project heads and group leaders are responsible for providing effective leadership in the planning and conducting of research work.

The Division Director is responsible not only for the nature and quality of the nuclear science research program, but also for assuring that research activities are planned and conducted in accordance with DOE, UC, and LBL policies, procedures, and regulatory requirements in areas such as environmental protection, occupational safety, fiscal and personnel administration, and quality assurance. The Division Deputy Director assists the Director in all areas and substitutes for the Director in his absence. The Division Administrator is charged with overall fiscal and personnel administration for the Division. The Division Deputy Director and Division Administrator are variously assigned primary oversight at the Division level for such matters as ES&H quality assurance, space management, and technology transfer. A Professional Staff Committee provides guidance in personnel selection. The Safety Committee strengthens the Division's commitment to ES&H by periodically assessing the Division's activities and facilities and by offering assistance to line management.

Line managers are responsible for providing effective scientific leadership, supervision, and educational guidance, for sound fiscal management of projects and research programs, for performing administrative tasks for the Division, and for conducting all work safely and with consideration for protection of the environment. Individual employees are responsible for the quality of their work and for conducting that work in compliance with LBNL personnel, quality assurance, and EH&S policies and procedures.

The Division ES&H program consists of two separate, but coordinated parts: the Division ES&H Committee and the 88-inch Cyclotron Safety Committee, respectively. Each has representatives on the other committee. The Division ES&H Committee Chair is responsible for coordinating the self-assessment program; and committee members lead self-assessment teams. The Chair of the Nuclear Science Division's Environment, Safety & Health Committee reports directly to the Division Director, Lee Schroeder or the Division Deputy Director, Janis Dairiki. The current chair is R.J. McDonald. Membership of the committee includes representatives of the groups. The Division ES&H Coordinator is a member of both committees and administers many of the compliance and safety documentation activities.

For purposes of this hazard analysis, the activities of the Division were grouped into the following functional areas:

88 Inch Cyclotron operations and experimental areas.
Laboratory spaces
Office Spaces

Operations on the University of California Berkeley (UCB) campus consist of only one activity located in Building 19A. The work was not evaluated for this PHA.

PERFORMANCE EXPECTATIONS AND OBJECTIVES

Research Program Management Responsibility for Safety

Line management is responsible for the protection of the public, the workers, and the environment.

At the Berkeley Laboratory the following documents establish the policy and provide the implementation guidance that makes line management effectively accountable for protection of workers, the public and the environment:

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- Employee Performance/Progress Review, Section III (1996)

Clear Roles and Responsibilities

Clear and unambiguous lines of authority and responsibility for ensuring safety are established and maintained at all organizational levels within the Department (DOE) and its contractors.

Each division making up the Berkeley Laboratory has clearly defined lines of responsibility down to the working level. Each division designates a research investigator to represent its views and concerns on the Laboratory Safety Review Committee and a full time employee to act as the ES&H Coordinator. This Coordinator acts as the interface between ES&H concerns and compliance in the workplace and the EH&S technical professionals.

Competence Commensurate with Responsibilities

Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

Job assignments, including hires, are reviewed by line management and by the compensation group within Human Resources to ensure that the requirements and responsibilities of a job are matched by the experience, knowledge and skills of individuals selected for assignment.

The Laboratory's training program ensures that each staff member, including participating guests, is adequately trained to participate safely in Laboratory activities. Staff, with supervisor participation, fill out the Jobs Hazards Questionnaire (JHQ), describing the hazards associated with their job assignment and work area. Evaluation of the responses by the Training Coordinator and the cognizant supervisor determines the training regimen needed to carry out work in a manner that protects the employee, co-workers, the public, and the environment.

Balanced Priorities

Resources are effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment is a priority whenever activities are planned and performed.

All environment, safety and health activities in the Laboratory are described in technical terms with budgetary information included. Each year this information is updated, reviewed and prioritized on the basis of risk to workers, public, and the environment by a Laboratory wide committee selected to represent programmatic line management and ES&H professionals. This document is utilized by Laboratory Senior Management in strategically planning the immediate focus and long term goals of the environment, safety and health program at the Laboratory.

Hazard Controls Tailored to Work Being Performed

Administrative and engineering controls to prevent and mitigate hazards are tailored to the work and associated hazards being performed.

Chapter 6 of the Environment, Health and Safety Manual clearly defines the steps for each line manager to develop the appropriate engineering and administrative controls to mitigate hazards in the workplace. The Laboratory's Self Assessment Program, including Functional Appraisals by ES & H professionals, and the UC/DOE Contract 98 Performance Measures provide assurance that implementation of hazards control is adequate to protection the worker, the public, and the environment.

Identification of Safety Standards and Requirements

Before work is performed, the associated hazards are evaluated and an agreed-upon set of safety standards and requirements are established which, if properly implemented, provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.

The Laboratory is dedicated to following the Necessary and Sufficient Closure Process (DOE 450.3) on an iterative basis at all levels of activities in the Laboratory to ensure the Safety Standards are adequate to provide protection to workers, the public and the environment. This process is completed by commencement of work in those situations where current work is significantly modified, new work is proposed or substantial facility modifications are being made (Chapter 6, Environment Health and Safety Manual).

Operations Authorization

The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed-upon.

Conditions and requirements for facilities determined to be of higher risk based on the Preliminary Hazards Analysis are contained in a Safety Analysis Document. Activity Hazard Documents are the basis for meeting this requirement for specific operations and activities falling into the higher risk category at the Berkeley Laboratory. Internal Agreements describing the performance expectations by each party are used for operations between two functional areas where the quality of performance might adversely impact the Laboratory's ability to meet its responsibility to protect workers, the public and the environment.

ACTIONS TO BE PERFORMED

The Nuclear Science Division's principal activity is basic research in theoretical and experimental nuclear science aimed at understanding the structure and interactions of nuclei and the forces of nature as manifested in the nuclear medium. Applications and impact of these studies on other areas of science, e.g., astrophysics and high energy physics, are also part of this activity. Other responsibilities include operation of the 88-Inch Cyclotron as a national facility, education and training of future generations of scientists, and transfer of knowledge and technological innovations and fostering of productive relationships among the Division, universities, and industry. The Division research programs support the LBL mission, the national nuclear physics goals, and the mission of the Department of Energy.

1. The Division maintains programs and expertise encompassing a broad range of nuclear science—relativistic heavy-ion physics, low-energy nuclear physics, nuclear theory, nuclear astrophysics and weak interactions, nuclear chemistry, nuclear data evaluation, and detector development. Division members participate in national and international collaborations and have a leadership role in many of them, for example, STAR (Solenoidal Tracker at RHIC), Gammasphere, and the Sudbury Neutrino Observatory (SNO). Knowledge gained is made available through publication in national and international journals and in the Isotopes Project's *Table of Isotopes*.
2. The 88-Inch Cyclotron is operated as a national facility in support of DOE programs in basic nuclear science. The Cyclotron serves researchers from LBL, the other national laboratories, universities, and foreign institutions. In addition to basic research, the Cyclotron provides a crucial service to organizations involved in the U.S. space program.
3. The Division has a commitment to graduate and postdoctoral training and to the broader educational objectives of the Laboratory. The Division offers opportunities for graduate training in the theoretical and experimental programs. The Division regularly employs about 20 postdoctoral fellows. Division members who hold faculty appointments at the University of California also participate directly in undergraduate education. The Division participates in the activities of LBL's Center for Science and Engineering Education, which undertakes a broad program of precollege, college, and teacher education, with an emphasis on women and minorities. In addition, the Division has established an Education Committee to further its educational activities in the community.
4. Technology transfer is an integral part of the Division's efforts, and formal and informal collaborations, workshops, and visits provide ongoing interactions with universities, industry, and other research institutions. The division encourages the development of new opportunities for technology transfer. The division works with the LBL Technology Transfer Department in such areas as information transfer, patenting and licensing, and contractual arrangements for research sponsored by agencies other than DOE.

PHYSICAL CONDITIONS WITHIN WHICH THE WORK WILL BE PERFORMED

Building 19 (LeConte Hall)

Building 19 located on the University of California, Berkeley campus. NSD occupies laboratory and office space in this facility. LBNL and UC, Berkeley have a MOU that places EH&S services under the jurisdiction of the University, and therefore NSD operations at Building 19 were not considered in this PHA.

Building 50 Complex

Nuclear Science Division occupies a portion of this complex (50, 50A, 50B and 50E). Currently the administrative offices of the Division are located in 50E. Nuclear Astrophysics/Weak Interactions group, Isotope Projects group, SNO, and Relativistic Nuclear Collisions group offices are located in building 50, 50A and 50B complex. In addition there is one laboratory located in Building 50.

Building 51

Building 51 is the former Bevatron accelerator facility. NSD conducts a laser operation in room 101, B51F in the EPB Hall in support of the Relativistic Nuclear Collisions Group.

Building 70

Building 70 is a three story laboratory building. NSD occupies laboratories, including wet chemistry, counting facilities and office space for support of nuclear chemistry and the Heavy Elements group on the second floor. There are two laser operations currently occupying laboratory and office suites on the first and second floors in support of the Relativistic Nuclear Collisions group. Office space for STAR, and Theoretical Nuclear Physics staff is also located in Building 70.

Building 71

Building 71 is a two story AFRD Facility and contains the old decommissioned Super Hilac accelerator, office space, Laser laboratories, shop areas and general purpose laboratories. NSD utilizes only one general purpose laboratory, Room 140 in support of the Heavy Elements group.

Building 72

Building 72 is a multi-storied facility, housing the National Electron Microscopy Center. NSD operates a low background counting facility in two rooms on the first floor.

Building 88

Building 88 houses an 88 inch cyclotron (particle accelerator), with associated laboratory and office space in support of low energy nuclear physics. It is a user facility with experimenters from other DOE laboratories, universities, and industry utilizing particle beams for a variety of experimental protocols. The main cyclotron and 8 experimental areas are shielded for radiation protection and access interlocked to prevent unauthorized personnel access. There is a laser

laboratory located in Cave 5. Shops and engineering space are used in support of experiments and operations at the Cyclotron.

MATERIALS AND CONDITIONS THAT COULD CAUSE ADVERSE CONSEQUENCES

GENERAL

The Nuclear Science Division (NSD) includes approximately 25 laboratories and the 88-inch Cyclotron Shielded Experimental Complex in which hazardous chemicals are used. Several of the laboratories and accelerator beam facilities make use of ionizing radiation sources, lasers, cryogenics, magnetic fields and noisy equipment. Vacuum systems and compressed gasses are used throughout the accelerator complex and in limited ways in the other laser and laboratory's in NSD.

Electrical and Mechanical Hazards: The 88 -inch Cyclotron and direct support areas utilize high voltage, high current, RF and magnetic systems which constitute potential hazards. A limited array of electrical and mechanical hazards in addition to the Cyclotron facility are present in the NSD. These include high voltage electrical systems, repetitive trauma associated with office work, vacuum systems, some pressurized gas systems, belt driven equipment, centrifuges, ovens, engineered enclosures and cryogenics.

Electrical Hazards

- The primary electrical hazard associated with NSD is the use of high voltage in the accelerator and in laser laboratories .
- High voltage power is also associated with other equipment, such as RF sources, stored energy capacitors and a variety of power supplies.
- The overall level of concern associated with high voltage equipment is low. There is a moderate concern at the 88-inch Cyclotron. This arises because of the custom nature and maintenance of high current and high voltage used in the cyclotron ion sources.

Pressure and Vacuum Hazards

- The overall level of concern associated with pressure and vacuum systems in NSD is low.
- The main pressure hazards are the compressed gas cylinders, mostly nitrogen, helium, oxygen, and argon.
- There are no significant pressure systems in NSD.
- There are a few glass systems that are filled from a compressed gas cylinder.
- The main cyclotron and associated beam lines are under vacuum. The main vacuum concern is the loss of vacuum integrity of the system and under normal conditions would not directly result in injury to persons.
- There is a large cryogenic nitrogen system for use in cooling and back filling the cyclotron. There is also a system for cooling the detectors for the gamma sphere experiment.

Ovens

- The overall level of concern associated with the use of ovens in NSD is very low.
- Low temperature (<100 degrees C) ovens are used in NSD.
- High temperature ovens (2000 degrees C) are used in the 88-inch cyclotron ECR source.

Centrifuges

- The level of concern associated with the use of centrifuges is low in NSD.
- Special high speed centrifuges are used at the cyclotron and many more small centrifuges are used in NSD facilities.

Confined Space/Oxygen Depletion

- The level of concern is low in NSD and arises from the Cave 4C (Gamma Sphere) and the RF tank in the cyclotron vault.
- Cave 4C contains 6 240L dewers and 2 110L dewers of LN

Repetitive Mechanical Trauma

- Office operations include the usual array of ergonomic issues, notably those associated with the use of computers and workstations. This issue is of moderate concern based on the NSD accident injury performance summary reports.

Chemical Hazards: A variety of toxic, flammable, corrosive, reactive or otherwise dangerous chemicals are used in the NSD. In almost all cases, the quantities used at any time are quite small, consistent with typical machine shop, maintenance and laboratory operations. Examples of hazardous chemicals in use in NSD are provided below.

Flammable Gases:

- The level of concern relating to the use of flammable gasses in NSD is low to moderate.
- The methane/argon installation present in Cave 2 poses a relatively moderate level of concern due to its communication with an adjoining space (Cave 1).
- Flammable gases are not widely used in NSD. One cylinder of compressed hydrogen was identified in a laboratory in Building 88, and a cylinder of di-methyl ether in a lab in Building 70.

Flammable Liquids:

- The level of concern associated with the use of flammable liquids in NSD is low overall, except in Building 71, Room 140 and Building 70, Rooms 203 and 209, where the concern is moderate.
- Flammable liquids are used throughout NSD, normally in small quantities.
- Three rooms were identified as having a moderate level of concern associated with flammable liquids, in all cases because the quantities in storage.
- Typical flammable liquids include ethyl alcohol, isopropyl alcohol, toluene, and acetone.

Inert Cryogens:

- The level of concern associated with the use of inert cryogens is low.
- Liquid nitrogen is used widely in dewers up to 210L.
- The 88-inch cyclotron has dewers directly plumbed to experimental apparatus or equipment.

Corrosives:

- The level of concern associated with the use of corrosives in NSD is low overall
- Most of the NSD laboratories store or use small amounts of corrosive materials.
- Common corrosives include acids associated with bright dip tanks, hydrochloric acid, and sodium hydroxide.
- Dilute boric acid containers are used for shielding in Cave 2 at the 88-inch Cyclotron.

Reactives:

- The level of concern associated with the use of reactives in NSD is moderate.
- Small amounts (550 mg per squib) of reactive chemicals (pistol powder) is used as squibs for the 2 quick closure devices (slammer valve) in the accelerator beam lines.

Reproductive Toxins:

- The overall level of concern associated with the use of reproductive toxins in NSD is low.
- No labs were identified with a level of concern of moderate to high.
- Common reproductive toxins include benzene, formaldehyde, and toluene.
- Laser dyes were identified in a few laboratories

Carcinogens:

- The overall level of concern associated with the use of carcinogens in NSD is low.
- A lab in Building 88 was identified as having Beryllium stored in a glove box.
- Small quantities of organic carcinogens such as ethylene dichloride, chloroform, benzene, RGG dye, and carbon tetrachloride are used.

Pyrophorics:

- The overall level of concern associated with the use of pyrophorics in NSD is moderate due to the use and storage of lithium.
- Lithium was only identified in a few labs.
- Pyrophoric gas (SiH^4) is used with the ECR ion source in Building 88. A special toxic gas cabinet is used for storage.

Toxic Materials:

- The overall level of concern associated with the use of toxic and extremely toxic materials in NSD is low.
- Only one facility was identified as having a moderate level of concern associated with the use or storage of large quantities of borax used for shielding at the cyclotron.
- Typical inorganic toxic compounds include borax, beryllium, potassium cyanide and mercury.
- Typical organic toxic compounds include methanol, ethylene glycol and laser dyes.
- Typical highly toxic chemicals include cyanide salts and chloroform.

Health Hazard Gases:

- The overall level of concern associated with health hazard gases in NSD is low.
- Very few toxic gases are used in NSD. Toxic gases were only found in building 88 in 2 lab rooms.
- Toxic gases in use include: hydrogen chloride, hydrogen bromide, and sulfur dioxide.

Oxidizers:

- The overall level of concern associated with the use of oxidizers in NSD is low.
- No laboratories were identified as having a moderate level of concern associated with oxidizers.
- Typical oxidizers include compressed oxygen and nitric acid.

Physical Agents: Physical agents in addition to electrical and mechanical hazards present in NSD include accelerators, lasers, noise, magnetic fields and RF radiation. Each of these is discussed below.

Radiofrequency/Microwave Radiation

- The overall level of concern associated with the use of radiofrequency/microwave radiation in NSD is low.
- The only use of RF/MW besides commercial food-type ovens is the cyclotron.

Lasers

- The overall level of concern associated with the use of lasers in NSD is low.
- Most of the lasers in use are very low power units.
- There are a couple of class 3 or class 4 lasers in use.

Noise

- The overall level of concern associated with noise in the NSD is low.
- The primary source of noise exposure is the pumps in the cyclotron high bay and caves, and machinery noise in the machine shops.
- Ear plugs were worn by machinists when applicable.

Magnetic Fields/RF Radiation

- The overall level of concern associated with magnetic fields and RF radiation in NSD is low. Strong DC magnetic fields are present in the cyclotron and associated beam lines for steering particle beams into the various cave experimental areas.

Accelerators and Radiation: NSD has several types of activities which have radiation hazards. Research and development includes actinide chemistry and target preparation in Building 70. The Building 88 cyclotron is a user facility with activities which include heavy elements chemistry, proton decay, laser beam, cell biology, materials effects, cosmic ray interaction studies, and gamma sphere nuclear physics.

Actinide Chemistry: Radioactive materials are used in fume hood and glove box work using both standard and advance chemical methods. These operations take place in both Building 70 and 88. Because of the higher levels of radioactive materials used in conjunction with this research the concern is moderate. The Radiation Work Authorization for these operations are Class III.

Accelerator: The 88- inch cyclotron is located in Building 88 and can accelerate ion beams from hydrogen to uranium. It can accelerate protons to 55 MeV and alpha particles to 130 MeV. The maximum heavy-ion beam energy is 32.5 MeV/nucleon. Maximum current is less than 100 μA for all beams. The overall level of concern for accelerator operations is low. For maintenance operations, because of the potential for contamination and for elevated radiation levels, the concern is moderate. Operations at the 88-inch Cyclotron are covered by the following safety documents: Safety Analysis Document (SAD) which incorporates the safety envelope for machine operation, AHD's for the larger and more comprehensive experiments, and either RWA's or RWP's for radiological work.

Approved radioactive material and sealed sources are also handled at the 88 inch Cyclotron.

Effluent from research activities and the accelerator is monitored according to NESHAPS requirements.

UNCERTAINTIES ABOUT THE WORK

There are no unique uncertainties which will impact hazard identification and selection of applicable and appropriate standards and requirements. At the 88 Inch Cyclotron, the GammaSphere program located in Cave 4C is scheduled to move to ANL East in FY 1997. This move is not anticipated to change appropriate standards and requirements.

RESOURCE AVAILABILITY AND CONSTRAINTS

No significant changes in NSD resources devoted to ES&H activities are planned.

Representatives of the NSD (Janis Dairiki, Darlene Hoffman and Claude Lyneis) offered the following evaluation of the EH&S Division past and future resources and support:

- The need for EH&S resources and support for the coming year should be roughly the same as last year.

- NSD is satisfied with EH&S support (except as listed below) during the past year. NSD is pleased with the continued improvement of close customer contact and support from EH&S professionals.

- NSD is "highly" confident that EH&S will meet NSD needs in the coming year.

- The following support needs/issues were raised by NSD:
  - One area of need expressed was for a consistent Radiological Control Technician at the 88-inch Cyclotron.
  - Hazardous waste and environmental rules are rapidly changing, and there will be a need for additional attention to customer assistance from EH&S in the future

- Suggestions for improvements: Continued integration of NSD's EH&S activities with the EH&S Field Support Departments activities.

STAKEHOLDER CONCERNS

There are no stakeholder concerns unique to NSD. NSD has managed, controlled, and permitted (as required) air, water, hazardous, and solid waste streams.

Environment, Safety, and Health

INTEGRATED HAZARD APPRAISAL

of

BERKELEY LAB

PHYSICS DIVISION

August 19, 1996

Work and Hazards Identification
to
Define the Necessary and Sufficient Standards Set
and
Direct Appraisal Efforts

Report on the EH&S Integrated Hazard Appraisal
of the Physics Division
To Define the Necessary and Sufficient Standards Set

Hazards Identification Team

Team Member	Technical Specialty
James Chwang	Fire Protection - DOE Oakland
Paul Davis	Industrial Hygiene and Team Leader
Keith Gershon	Occupational Safety
Connie Grondona	Health Services
Kathie Hardy	Physics Division Safety Coordinator
Roger Kloepping	Radiation Protection
Mark Lasartemay	Waste Management
Ron Madaras	Physics Division Researcher
Pat Thorson	Environmental Protection
Tony Yuen	Fire Protection

PROJECT TIME-LINE

Activity	Date
Collect and Review Information	6/3/96 - 6/12/96
Establish Team Members	6/14/96
Initial Hazards Identification & Grouping	6/25/96
Field Check Spaces	7/12/96
Finalize Risk Survey Sheets	7/22/96 - 7/24/96
Summary Report Draft	7/25/96

Organization and Management

The Physics Division is composed of sixteen scientific research programs whose leaders report directly to the Division Director (Robert Cahn). These program leaders are responsible for the scientific excellence, relevance to the DOE mission, and fiscal integrity, of their programs. This also includes adherence to all administrative and regulatory requirements. The Division Safety Administrator (Kathie Hardy) is charged with oversight of matters pertaining to environment, safety, and health (ES&H). The Division Safety Administrator reports to the Division Director. An ES&H Committee meets monthly and provides guidance to the Division Director with regard to ES&H concerns. The ES&H Committee is representative of program and administration, and includes scientists, technicians, and administrators.

On-site operations are located in Berkeley Lab buildings (B) 50, 50A, 50B, B51G, 60, and 70A. Experiments are also conducted off-site, such as Fermilab, SLAC, and CERN.

PERFORMANCE EXPECTATIONS AND OBJECTIVES

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Competence Commensurate with Responsibilities

Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

Job assignments, including hires, are reviewed by line management, and by the compensation group within Human Resources to ensure that the requirements and responsibilities of a job are matched by the experience, knowledge and skills of individuals selected for assignment. A performance expectation for managers and supervisors in the Physics Division is how well the talents, knowledge and skills of staff are matched to work assignments and responsibilities

The Laboratory's training program ensures that each staff member, including participating guests, is adequately trained to do participate safely in Laboratory activities. Staff, with supervisor participation, fill out the Jobs Hazards Questionnaire (JHQ) describing the hazards associated with their job assignment and work area. Evaluation of the responses by the Training Coordinator and the cognizant supervisor determines the training regimen needed to carry out work in a manner that protects the employee, co-workers, the public, and the environment.

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Identification of Safety Standards and Requirements

Before work is performed, the associated hazards are evaluated and an agreed-upon set of safety standards and requirements are established which, if properly implemented, provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences. This is reflected in Physics Division's excellent safety record, which has the lowest accident rate for any division at LBNL.

The Laboratory is dedicated to following the Necessary and Sufficient Closure Process (DOE 450.3) on an iterative basis at all levels of activities in the Laboratory to ensure the Safety Standards are adequate to provide protection to workers, the public and the environment. This process is completed by reevaluation of work in those situations where current work is significantly modified, new work is proposed or substantial facility modifications are being made (Chapter 6, Environment Health and Safety Manual).

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ACTIONS TO BE PERFORMED

Work at the Physics Division involves research in theoretical and experimental particle physics and astrophysics, incorporating such activities as development of detectors and other hardware, development of software, data compilation and analysis, as well as publication and presentation of research results.

PHYSICAL CONDITIONS WITHIN WHICH THE WORK WILL BE PERFORMED

The Physics Division is primarily located in Buildings 50, 50A, 50B, B51G, 60, and 70A. In addition to these areas, physicists in this division participate in national and international collaborations which carry out work at other institutions, such as CERN, Fermilab and SLAC. The types of rooms this division occupies vary widely, ranging from offices to electronic labs and clean room type environments.

MATERIALS AND CONDITIONS THAT COULD CAUSE ADVERSE CONSEQUENCES

Electronic Type Laboratories
These types of laboratories typically design, assemble, and test various types of electronic equipment.

Chemical/Inerts: Generally small quantities of cleaning type solvents, such as ethyl alcohol and acetone. Some cryogens and inert gases are also used, though the quantities are also small. Hazards associated with these material are low because of the small quantities and proper storage (e.g., flammable storage cabinets) facilities that are available.

Flammable gases: One laboratory (50B/6209) has flammable gas, which is stored in a ventilated gas cabinet equipped with a flow sensor and alarm.

Electrical: Electrical shock is perhaps one of the greater hazards in these types of laboratories. To reduce this risk, employees attend a electrical safety class.

Lasers: One laboratory (50A/6113) has one enclosed 3B laser; a laser safety document has been written and approved for this area.

Sealed Sources: A number of these laboratories have sealed radioactive sources. They are stored in locked cabinets, logs of their use are kept, and all users have dosimeters.

Shops
Mechanical hazards are found in these areas. Guards have been installed on all machines, and shop training is given by the shop manager. There is some crane use, and all crane operators are certified.

Multipurpose Microgap Lab (50A/2155)
This laboratory uses significant amounts of flammable gases. There is a flammable gas detection system with sensors placed both in floor and ceiling locations, as well as a solenoid system that automatically shuts off gas flow in the event of an alarm condition.

Radiation: This area has sealed sources that are stored in a locked cabinet, a log of their use is kept, and users have dosimeters. In addition, there are two X-ray machines that have X-ray safety documents.

Plasma Enhanced Chemical Vapor Deposition Facility (70A/3343)
This is a restricted access laboratory that contains flammable gases, flammable liquids, inert gases, corrosives, oxidizers, toxic gases, pyrophoric gases, a RF source, and highly toxic materials. To mitigate these hazards, there is a toxic gas monitor which is interlocked with the toxic gas cylinders, the Fire Department, and audio and visual alarms. Toxic gas cylinders are installed in a ventilated gas cabinet, have restricted flow orifices and excess flow trip valves. This room is also equipped with other safety systems, such as a caustic scrubber and a laboratory hood. The AHD for this laboratory describes these safety systems in detail. In addition, Building 70A is equipped with emergency standby power and a permitted acid waste neutralization system, both of which are maintained by Facilities.

Microsystems Laboratory (70A/4435-4457)
This is a clean room, restricted access type laboratory. It contains flammable gases, flammable liquids, inert gases, corrosives, oxidizers, toxic gases, pyrophoric gases, a RF source, and highly toxic materials. To mitigate these hazards, there are ventilated work stations, equipment specific ventilation systems, as well as toxic and flammable gas monitors which are interlocked with the gas cylinders. These monitors shut off gas flow and activate visual and audio alarms both in this room and the Fire Department. Gas cylinders are installed in ventilated gas cabinets, have restricted flow orifices and excess flow trip valves. The AHD for this laboratory describes these safety systems in detail.

Division-Wide
Ergonomic hazards associated with the use of computers are the most common hazard in this division, with virtually everyone exposed to this hazard. Employees are encouraged to have their

workstations evaluated and the proper chairs and keyboard accessories are purchased. Tall and/or valuable lab research equipment is typically secured in labs (e.g., electronic racks) and office areas.

Environmental
SAA's were found to be in 100% compliance during this review. There is a specific BAAQMD permit for the Microsystems Laboratory. Before a new or modified research or construction project is implemented the division checks to ensure that all NEPA/CEQA requirements are met.

UNCERTAINTIES ABOUT THE WORK

Several research programs in this division are one of a kind collaborations with other facilities, such as CERN, SLAC or Fermilab. This can result in a rapidly changing research environment, where projects are finished and new ones started, often in a matter of months. This creates challenges in such areas as employee training and updating the chemical inventory.

RESOURCE AVAILABILITY AND CONSTRAINTS

No significant changes in Physics Division resources devoted to ES&H activities are planned.

Representatives of Physics (Kathy Hardy and Ron Madaras) offered the following evaluation of the EH&S Division past and future resources and support:

- The need for EH&S resources and support for the coming year should be the same as last year.
- Physics Division is satisfied with EH&S support during the past year.
- Physics Division is confident that EH&S will meet it's needs in the coming year.
- Suggestions for improvements:
  1. Notify the Division Safety Coordinator of new EH&S programs before contacting researchers.
  2. Always communicate with the researcher before entering a laboratory to audit equipment, chemicals, sealed sources, etc.
  3. Changes and re-organization in EH&S should be minimized because it creates confusion.
  4. Time and effort spent by EH&S staff members on EH&S issues, such as inspections, should be planned and scheduled to minimize disruption to the division.

STAKEHOLDER CONCERNS

There are no stakeholder concerns unique to Physics Division, which has managed, controlled, and permitted (as required) air, water, hazardous, and solid waste streams.

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Environment, Safety, and Health

INTEGRATED HAZARD APPRAISAL

of

BERKELEY LAB

STRUCTURAL BIOLOGY DIVISION

JULY 1, 1996

for
Work Definition and Hazards Identification

STRUCTURAL BIOLOGY DIVISION

July 1, 1996

INTRODUCTION

This report initially identifies the work activities and hazards that are present in the Ernest Orlando Lawrence Berkeley National Lab (Berkeley Lab or LBNL) Structural Biology Division (SBD) as part of the Integrated Hazard Assessment (IHA) process. Activities and hazards were identified in preparation for:

- Definition of the Necessary and Sufficient (N&S), or Work Smart, set of standards, and
- Direction of additional future Environmental Health, and Safety (EH&S) integrated functional appraisals.

In early June 1996, a multi-disciplinary team of research and EH&S representatives from Berkeley Lab and Department of Energy (DOE) Oakland Operations was identified (note team listing below). Team members and contributors met two or more times to review available work activity and hazard information, identify hazards related to activities, field-check findings, and complete identification worksheets. Identification worksheet information was then entered into the IHA information management system and reviewed for quality. Identification worksheets are enclosed, and are grouped by floors in Building 3 (Calvin). Building floor plans that show the layout of SBD operations are presented in the Attachment.

The body of this report summarizes: the IHA team participants, project time-line, SBD organization and management, ES&H performance expectations and objectives, SBD actions to be performed, SBD physical conditions within which the work will be performed, SBD materials and conditions that could cause adverse consequences, uncertainties about the work, EH&S resource availability and constraints, and stakeholder concerns.

IHA TEAM

Team Member	Technical Specialty
Jim Bartholomew	SBD Safety Coordinator
Paul Blodgett	LBNL Industrial Hygiene and Team Leader
Mat Kotowski	LBNL Occupational Safety
Connie Grondona	LBNL Health Services
Tony Yuen	LBNL Fire Protection
Christine Donahue	LBNL Radiation Protection
Li-Yang Chang	LBNL Waste Management
Ginny Lackner	LBNL Environmental Protection
Dave Tudor	LBNL Hazard Assessment
James Chwang	DOE Fire Protection
Tanya Goldman	DOE Waste Management

PROJECT TIME-LINE

Date	Activity
6/03/96	Collect and Review Information
6/04/96	Establish Team Members
6/13/96	Hazards Identification & Grouping
6/28/96	Field-Check Hazards Identification
7/29/96	Completion and Data Entry of Worksheets
7/01/96	Summary Report Draft
7/11/96	SBD Review

ORGANIZATION AND MANAGEMENT

The Scientific Department Head report directly to the Division Director, and are accountable for the scientific excellence, relevance to the Structural Biology Division (SBD) mission, as well as adherence to all administrative and regulatory requirements. The senior scientific staff meet weekly with the Division Director to discuss both scientific and safety issues of concern. The Deputy Director for Administration is the Division's designated ES&H Coordinator charged with oversight of all matters pertaining to environmental quality and health and safety of both employees and the public. An ES&H committee assists in this effort by meeting monthly and discussing relevant health and safety issues. The committee is chaired by the Deputy Director and is composed of one member from each research group.

PERFORMANCE EXPECTATIONS AND OBJECTIVES

Research Program Management Responsibility for Safety

Line management is responsible for the protection of the public, the workers, and the environment.

At the Berkeley Laboratory, the following documents establish the policy and provide the implementation guidance that makes line management effectively accountable for protection of workers, the public, and the environment:

- Operations Assurance Plan, OAP (1996)
- Self-Assessment Manual (1992) and Supplement (1996)
- Publication 3000, Environment Health and Safety Manual (1995)
- Chemical Hygiene and Safety Plan (1992)
- Waste Generator Guidelines (1996)
- Employee Performance/Progress Review, Section III (1996)

Clear Roles and Responsibilities

Clear and unambiguous lines of authority and responsibility for ensuring safety are established and maintained at all organizational levels within the Department and its contractors.

Each division making up the Berkeley Laboratory has clearly defined lines of responsibility down to the working level. Each division designates a research investigator to represent its views and concerns on the Laboratory Safety Review Committee and a full-time employee to act as the ES&H Coordinator. This Coordinator acts as the interface between ES&H concerns and compliance in

the workplace and the EH&S technical professionals. The organizational information is updated every 60 days and is retained in the Functional/Facility Notebook as appropriate (see OAP).

Competence Commensurate with Responsibilities

Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

Job assignments, including hires, are reviewed by line management, and by the compensation group within Human Resources, to ensure that the requirements and responsibilities of a job are matched by the experience, knowledge and skills of individuals selected for assignment. A performance expectation for managers and supervisors in the Division of Environment, Health and Safety is how well the talents, knowledge and skills of staff are matched to work assignments and responsibilities

The Laboratory's training program ensures that each staff member, including participating guests, is adequately trained to participate safely in Laboratory activities. Staff, with supervisor participation, fill out the Jobs Hazards Questionnaire (JHQ) describing the hazards associated with their job assignment and work area. Evaluation of the responses by the Training Coordinator and the cognizant supervisor determines the training regimen needed to carryout work in a manner that protects the employee, co-workers, the public, and the environment.

Balanced Priorities

Resources are effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment is a priority whenever activities are planned and performed.

All environment, safety and health activities in the Laboratory are described in technical terms, with budgetary information included. Each year this information is updated, reviewed and prioritized on the basis of risk to workers, public, and the environment by a Laboratory wide committee selected to represent programmatic line management and ES&H professionals. This document is used by Laboratory Senior Management to strategically plan the immediate focus and long-term goals of the environment, safety, and health program at the Laboratory.

Hazard Controls Tailored to Work Being Performed

Administrative and engineering controls to prevent and mitigate hazards are tailored to the work and associated hazards being performed.

Chapter 6 of the Environment, Health and Safety Manual clearly defines the steps for each line manager to develop the appropriate engineering and administrative controls to mitigate hazards in the workplace. The Laboratory's Self-Assessment Program, including Functional Appraisals by ES&H professionals, and the UC/DOE Contract 98 Performance Measures provide assurance that implementation of hazards control is adequate to protection the worker, the public, and the environment.

Identification of Safety Standards and Requirements

Before work is performed, the associated hazards are evaluated and an agreed-upon set of safety standards and requirements are established. If properly implemented, these standards will provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.

The Laboratory is dedicated to following the Necessary and Sufficient Closure Process (DOE 450.3) on an iterative basis at all levels of activities in the Laboratory, to ensure the Safety Standards are adequate provide protection to workers, the public, and the environment. This process is completed by commencement of work in those situations where current work is significantly modified, new work is proposed, or substantial facility modifications are being made (Chapter 6, Environment Health and Safety Manual).

Operations Authorization

The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed-upon.

Conditions and requirements for facilities determined to be of higher risk based on the Preliminary Hazards Analysis are contained in a Safety Analysis Document. Activity Hazard Documents are the basis for meeting this requirement for specific operations and activities falling into the higher risk category at the Berkeley Laboratory. Internal Agreements describing the performance expectations by each party are used for operations between two functional areas, where the quality of performance might adversely impact the Laboratory's ability to meet its responsibility to protect workers, the public, and the environment.

ACTIONS TO BE PERFORMED

Structural Biology's mission is to perform leading multidisciplinary research in structural and molecular biology using the techniques of X-ray crystallography, nuclear magnetic resonance, infrared spectroscopy, and other advanced spectroscopic techniques.

PHYSICAL CONDITIONS WITHIN WHICH THE WORK WILL BE PERFORMED

Building 3 Complex (Calvin)

Structural Biology Division is primarily located in the Calvin Building on the University of California Berkeley Campus. This three-story, round building has a flat roof with two trailer-like structures that form the fourth floor. The first floor houses the analytical laboratories including 4 laser labs, 2 nuclear magnetic resonance (NMR) labs, and one X-ray lab. The second floor is primarily a wet lab with 8 fume hoods, electrophoresis equipment, high performance liquid chromatographs (HPLC's); office space; and a computer room. The third floor is primarily a wet chemistry lab with 8 fume hoods and electrophoresis equipment; office space; one laser lab; and one RMMA/Bio lab with a biosafety cabinet. On the fourth floor, Room 410 is a wet lab with 3 fume hoods and DNA sequencing machines and Rooms 401-405 are the division's cell culture facility. The fume hoods from floors 1-3 exhaust at the parapet level of the roof.

Building 75 Complex

The NTLF, a research group with in SBD is located in Building 75 at the Berkeley Lab, and has already successfully completed the N&S process. Berkeley Lab employees who have affiliation with the Berkeley campus also work in Appendix J space, as defined by the memorandum of understanding (MOU) between the Berkeley Lab and the University.

MATERIALS AND CONDITIONS THAT COULD CAUSE ADVERSE CONSEQUENCES

Examples (not summaries) of typical materials and conditions that could cause adverse consequences if not controlled are listed below. These examples are first listed by Necessary and Sufficient requirements identification topic areas, and then by floors in Building 3.

Labs

First Floor

- An open beam laser in Room 134/136 has the potential for causing eye and skin injury. Through administrative controls, the operators are protected, and interlocked doors prevent unexpected entry to the room while the laser is in operation. The details of these controls are presented in an AHD.

- The fume hoods in Rooms 120 and 136 which house health hazard gases need a ventilation flow indicator with a visual readout and audible alarm. This engineering control indicator will help assure that the air flow in the fume hoods remains continuous.

Second Floor

- The second and third floors have an adjoining stair well in the center of the building. This is a fire protection issue since the stairwell is open, breaching the separation between floors.

Third Floor

- The handling of carcinogenic chemicals throughout SBD was found to be low frequency, small quantity per each use, and conducted in fume hoods. One bench-top use of chloroform (also infrequent and small quantity) will be evaluated for potential exposure.

Division-Wide

- Training for Berkeley Lab employees in Appendix J space needs additional oversight by SBD.

- Injuries from VDT use and pipeting have been reported. The SBD has supplied ergonomic chairs throughout the division, and fully supports employees participation in training. Injuries associated with pipeting need further evaluation.

Facilities

- The fume hoods from floors 1–3 exhaust are at the parapet level of the roof. Administrative controls have been included in an AHD for an accidental discharge of a health hazard gas in the fume hoods to reduce the potential of exposure to maintenance workers and other employees on the roof.

- The Air Handling Unit (AHU) on the roof is excessively noisy, and may be the source of noise exposure for maintenance workers and employees in the area. This issue will be investigated by Berkeley Lab Industrial Hygienists.

Accelerators and Radiation Sources

- There are no accelerators in the Calvin Building. Three X-ray machines are contained in interlocked enclosures. There are three sealed sources, two of which are used in scintillation counters, and the third in calibrating an X-ray detector.

Environment

- The Calvin lab is covered by the Berkeley Lab Site-Wide EBMUD discharge permit. There are no process specific permits.

Core

- The Calvin Building contains chemicals which have the potential to form peroxides during storage. These chemicals need to be tested routinely or disposed. A peroxide-forming test procedure has been developed for the NTLF and will be implemented throughout the Berkeley Lab.

UNCERTAINTIES ABOUT THE WORK

SBD lab space is being developed in Building 80 for research in conjunction with the Advanced Light Source (ALS). This user facility will employ hard X-ray techniques for diffraction studies of biological molecules and molecular complexes. Biological organisms which will be used at this user facility have not been defined yet. The facility is scheduled to open in September/October 96.

RESOURCE AVAILABILITY AND CONSTRAINTS

The following questionnaire was filled-out with input form the SBD Safety Coordinator.

1) Are resources and support expected and/or needed from EH&S in the coming year?

YES - There needs to be closer involvement of EH&S staff in the research operations to better understand the processes and give direct feedback. One example is confusion of the researchers regarding the process of requisitioning (logging) for pick-up of radioactive waste.

2) Now that you have evaluated EH&S support during the past year and determined the expectations for the coming year, describe your level of satisfaction in EH&S meeting the needs of your division in the current year:

Improving - Especially since the time of the Tiger Teams.

3) What is your level of confidence that EH&S can meet divisional needs in the coming year?

Moderate

4) What would it take to increase this rating?

Stabilize the process so that a few researchers do not have to spend so much time on EH&S issues to protect the many. An example of this is that one or two researchers are frequently asked about specific hazardous waste guidance.

STAKEHOLDER CONCERNS

There are no stakeholder concerns unique to SBD. SBD has managed, controlled, and permitted (as required) air, water, hazardous, and solid waste streams.

ATTACHMENT & ENCLOSURE

Attached are SBD organization charts and floor plans of SBD operations. Enclosed are the IHA worksheets for SBD operations that were completed.

Index of IFA Activities and Hazards

Environment, Health and Safety Division
Integrated Functional Analysis (IFA) Database

[Note: This worksheet is a tool for planning scheduled, periodic Environment, Health, and Safety Division (EH&S) appraisals for higher hazard operations at the Lawrence Berkeley National Laboratory. A "Yes" indicates a potential hazard is present. A preliminary level of concern determination or suitable explanation in the "Comments" section is indicated for hazards noted as being present; EH&S Specialists making these determinations must also be indicated.

Date Surveyed — Bldg
Division — Area
Type of Review — Research/Operation Type

A. Description of Scope and Mission of Division, Department, or Group

Categorical Examples of Activities

Survey ID 240

Activites	Present	Category	Comments	Level of Concern	ID Team
Cell Culture	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
HPLC	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Electrophoresis	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
NMR	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Gas Chromat.	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Mass Spectroscopy	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Rad Target Processing	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Chemistry in Special Containment	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Pressure Vessel	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Electronic Assembly	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Metallurgical Testing	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Vacuum Chambers	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Chemical Vapor Deposition	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Electron Microscopy	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Electron Microscopy Sample Prep	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Cleanroom	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Walk-In Hood	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
DNA Sequencing	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Human Experiment	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
ıimal Experiment	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
ıto Clave	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
ɔioSafety Cabinet	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Etching	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Darkroom	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Lasers	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Wet Chemistry	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Lithography	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
PCR	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
PET, SPECT	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Electrical Power	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Fatigue Testing	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Sputtering	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Non-Ionizing Radiation	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Metal Forming	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Soldering	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Abrasive Blasting	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Spectrometry	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Ion Implantation	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Thin Films Deposition	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
X-Ray Machine	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Cryostat	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Furnace	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Glovebox	O Yes O No	Lab		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Roof Inspections	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Machine Tooling	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Metal Finishing	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Wood Working	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Parts Polishing	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Parts Cleaning	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Trenching	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Etching	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Welding	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Offices	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
lectrical Power	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
.levator	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Drain System	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Janitorial	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
UST	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
AST	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Boilers	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG

Boilers	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Bead Blasting	O Yes O No	Fac		OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG

Specific Beamline Processes
Maintenance, Measurements List:

User Driven Work Area Modifications
Temporary power sheilding, etc. List:

Categories of Research Processes:

Use narrative as needed

Chemical /Biological Agents and Fire Safety

Survey ID 240

Hazard	Present	Room(s)	Comments	Level of Concern	ID Team
Flammable gases	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Flammable liquids	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Non-flammable, non-toxic cryogen	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Corrosives	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Flammable cryogen.	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Toxic cryogen	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Reactive or explosive	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Reproductive Toxin	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Carcinogen	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Pyrophoric gas, solid or liquid	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Toxic Materials	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Highly Toxic Materials	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
'JB-3000 defined health hazard gas	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
xidizers	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Biological	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG

Use narrative as needed

Physical Agents

Survey ID 240

Check the Physical agents that are known to be present: **Room(s)** **Comments** **Level of Concern**

Hazard	Present	Room(s)	Comments	Level of Concern	I D Team
High Voltage - Power Supplies (>600V,	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
High Voltage - Lasers	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
High Voltage - Electrophoresis	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
High Current - Power Supplies (>30	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
High Current - Welding Equipment	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Custom Built Electrical Equipment	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Stored Energy Capacitors (Stored	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Stored Energy - Battery Charging	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Stored Energy - UPS (Large, Fixed)	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Static Electricity In Hazardous Locations	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Maint./Repair of Equip. w/ Elect. Comp -	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Maint./Repair of Equip. w/ Elect. Comp -	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Maint./Repair of Equip. w/ Elect. Comp -	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Activity devoted to electrical electronic	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Ray / Gamma	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
NSI laser system	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
RF source (describe below)	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Static magnetic field > 5 gauss	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
User-designed or -modified UV source	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Confined space	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG
Normal conversation difficult or	O Yes O No			OH OM OL ON	☐F ☐A ☐E ☐LS ☐CG

Accelerators	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Repetitive Motion	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Rotating Equipment - Shop Equipment	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Rotating Equipment - Portable Power	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
tating Equipment - Belt-Driven	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
ating Equipment - Centrifuges	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
inear Motion - Power Press	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Linear Motion - Brake	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Linear Motion - Power Actuated Tools	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Linear Motion - Hydraulic Ram	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Linear Motion - Tensile Tester	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Cutting Equipment - Brake	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Cutting Equipment - Paper Cutter	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Fall From Height - Roofs	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Fall From Height - Elevated Platforms	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Fall From Height - Scissor Lifts	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Fall From Height - Fall Protection	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Seismic - Tall Equipment Secured	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☒ CG
Seismic - Expensive Equipment	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Pressure Equipment - Compressed Gas	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Pressure Equipment - Pressure Vessels	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Pressure Equipment - Stored Energy	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Pressure Equipment - Glass or Other	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Vacuum Equipment - Greater Than 10	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Vacuum Equipment - Windows Greater	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Vacuum Equipment - Back-Filled From	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Cryogenics - Cold Traps	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Cryogenics - Cryogen in Pipes or Tubing	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Hydraulic Equipment - Commercial	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Hydraulic Equipment - Custom Built at	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Spring Loaded Equipment	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Gravity Loaded Equipment	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Manual Lifting	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Bridge Crane	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Monorail Crane	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Motorized Hoist	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Manual Hoist	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
ifting Fixtures	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
ks	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
klifts - Frequent Use	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Forklifts - Incidental Use Only	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Construction Equipment	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Motor Vehicles - Professional Driver	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Motor Vehicles - Frequent Use	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Motor Vehicles - Incidental Use Only	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Ovens	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Infrared Heaters	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Heat Tapes	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Welding, Open Flames	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Unattended Operations	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG

Use narrative as needed

Sources/Processes/Area Subject at LBNL or Regulatory Requirements:

Survey ID 240

Hazard	Present	Room(s)	Comments	Level of Concern	ID Team
AHD Renewal/Modification	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
DTSC permitted hazardous waste	O Yes O No			O H O M O L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Waste Accumulation Area	O Yes O No			O H O M O L O N	☐ F ☐ A ☒ E ☐ LS ☐ CG
Satellite Accumulation Area	O Yes O No			O H O M O L O N	☐ F ☐ A ☒ E ☐ LS ☐ CG
EBMUD permitted facility	O Yes O No			O H O M O L O N	☐ F ☐ A ☒ E ☐ LS ☐ CG
PCB contaminated equipment	O Yes O No			O H O M O L O N	☐ F ☐ A ☒ E ☐ LS ☐ CG
Equipment containing Ozone	O Yes O No			O H O M O L O N	☐ F ☐ A ☒ E ☐ LS ☐ CG
QMD permitted source	O Yes O No			O H O M O L O N	☐ F ☐ A ☒ E ☐ LS ☐ CG
permitted discharges to air/water.	O Yes O No			O H O M O L O N	☐ F ☐ A ☒ E ☐ LS ☐ CG
ss 1 Radiological Work Authorization	O Yes O No			O H O M ◉ L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Class 2 Radiological Work Authorization	O Yes O No			O H O M ◉ L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Class 3 Radiological Work Authorization	O Yes O No			O H O M ◉ L O N	☐ F ☐ A ☐ E ☐ LS ☐ CG
Underground Storage Tank	O Yes O No			O H O M O L O N	☐ F ☐ A ☒ E ☐ LS ☐ CG
Aboveground Storage Tank	O Yes O No			O H O M O L O N	☐ F ☐ A ☒ E ☐ LS ☐ CG

Use narrative as needed

Other Factors

Note when applicable and describe in space provided:

Significant modifications or new program/project

Medical Surveillance or EH&S exposure

External, EH&S, OAA, or Division Assessment indicates

Occurrence, injury and illness statistics, vehicle accident

VI. Appraisal Scheduling Issues/Considerations

Describe scheduling issues or considerations, if any:

Issue Documents

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Above ground Storage Tank (AST) and Transformers (non PCB) **Issue ID** 1

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

Clean Water Act, 33 U.S.C. 1251 et.seq.
29 CFR 1910.106, Flammable and Combustible Liquids
40 CFR 110, Discharge of Oil; 112, Oil Pollution Prevention;
California Fire Code, Article 79 and Article 80 (with respect to the control of water pollution)
California Aboveground Storage Act, H&S Code, Division 20, Chapter 6.67, Aboveground Storage of Petroleum (to the extent involving discharges to navigable waters)
Note: For aboveground storage of hazardous waste, refer to the hazardous waste standards ID document and for spills, the accidental release reporting document

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Legal requirements cited include construction design requirement, secondary containment requirements, SPCC Plan requirements, tank inspection requirements, and penalties for non-compliance and for discharges (spills) to the environment.

15. **Provide assumptions for implementation of standard(s).**

Compliance activities will continue to meet the necessary legal requirements and their implementation should not result in any impacts.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Roger Kloepping; Mike Schoonover

Accelerators - On-Site Exposure **Issue ID** 3

Radiation and Radioactive Materials - On Site Exposure
General radiation safety requirements associated with accelerators. Protection of occupational workers from direct radiation a nd from radioactive material produced and used at accelerators.

Related issues:
Lab ID Team : Radiological Protection Program; Radiation Dose Limits and Dose Assessment

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

10 CFR 835

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

LBNL must comply with legal standards (10 CFR 835).
The detailed RPP will facilitate more consistent evaluation of regulatory compliance by LBNL and DOE.

15. **Provide assumptions for implementation of standard(s).**

Implement the requirements of 10CFR835 similar to the implementation of 10 CFR 20 in industry. The detailed RPP based on the selected standards will address the hazards to this particular site and will contain enforceable controls that comply with the regulation, but are tailored to site hazards.

The existing RPP would require modification. Chapter 21 of PUB 3000 will be included in the RPP and will require a revision to include exempt quantities for labeling, sewer release limits, the modified radiation safety training program , and others.

Safety systems that are unique to accelerators will be implemented via guidelines included in PUB 3000, Chapter 21, and supplemented by applicable sections in NCRP 51 and 88, and SLAC PUB 327.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☒ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Accidental Release Reporting **Issue ID** 4

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

CERCLA : 42 U.S.C. § 9603, 40 CFR § 302.1 et seq.
Clean Water Act : §§ 1321 (b) (5), 40 CFR §§ 11.10, 117.21; Health and Safety Code § 25270.8.
California Water Code §§ 13271, 13272, 13050 (p) (2) (c); 23 CCR §§ 2250, 2251, 2260; Health and Safety Code § 25270.7; to the extent involving discharges of "pollutants" (non-AEA materials) to "navigable waters" (which do not include groundwaters).
Hazardous Waste: 22 CCR §§ 66262.34, 66264.56; 13 CCR 1166(b); LBL HWHF Permit reporting provisions; Health and Safety Code § 25242, Health and Safety Code §§ 25189(c), (d), 25189.2(c), 25189(f); Health and Safety Code § 25359.4 and Health and Safety Code Section 5411.5, (except AEA materials).
Underground Storage Tanks : 40 CCR §§280.34 (a) (2), 280.50, 280.53, 280.61; Health and Safety Code § 25295 (a) (1), 23 CCR § 2650, 2652.
PCBs: 40 CFR § 761.125 (a) .
Air: BAAQMD Reg 1-431, 1-432.
Hazardous Materials Transportation 49 U.S.C. § 5110 (d) and, assuming not preempted by DOT regs, California Vehicle Code § 23112.5, 13 CCR 1166.
City of Berkeley Stormwater ordinances, to the extent involving non-AEA materials.

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Clean Water Act: Sections 1321 (b) (5) , 40 CFR Sections 11.10, 117.21
- and, per 33 U.S.C. Section 1323, Health and Safety Code Section 25270.8 (AST spills that are reportable under CWA) and Government Code Section 8670.25.5 (oil spills to marine waters)
- and , per 33 U.S.C. Section 1323, to the extent involving discharges of "pollutants" (which do not iclude AEA - regulated materials) to " navigable waters" (which do not include groundwaters): California Water Code Sections 13271, 13272, 13050 (p) (2) (c); 23 CCR Sections 22250, 2251, 2260; Health and Safety Code Section 25270.7 (positive detection of AST leak);
Hazardous Waste: per RCRA Section 6001: 22 CCR Sections 66262.34, 66262.56; 13 CCR 1166 (b); LBL HWHF Permit reporting provisions; Health and Safety Code Section 25242 (unauthorized discharges of hazardous waste to state lands), Health and Safety Code Sections 25189 (c), (d), 25189.2(f); Health and Safety Code Section 25359.4; and Health and Safety Code Section 5411.5 (unauthorized discharge of waste or sewage to state waters reportable to local agency); to the extent involving nonAEA materials
Underground Storage Tanks: 40 CFR Sectionss 280.34 (a) (2), 280.50, 280.53, 280.61 (to my knowledge, state is not yet authorized for this part of the RCRA Program, so both state and fed requirements still apply); and, per RCRA

15. **Provide assumptions for implementation of standard(s).**

The Berkeley Lab will also voluntarily report accidential releases where sovereign immunity has not been waived pursuant to state and local codes (to the extent that reporting thresholds are consistent with those of the state).
These include:

These include:
EPCRA , 42 U.S.C. § 11004 and 40 CFR 355, per Executive Order 12856.
California Health and Safety Code §§ 25507, 25507.1; 19 CCR §§ 2703, 2705
City of Berkeley Municipal Code Chapter 11.52 for releases or threatened releases within Berkeley
California Water Code § 13271, 13272, 13050 (p) (2)(c); 23 CCR 2250. 2251, 2260; Health and Safety Code Section 25270.7, even if discharge is to groundwater, to the extent involving a non-AEA material
Oakland Municipal Code Chapter 2 Article 12

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Blodgett; Bruce King

ACGIH TLVs - Kopenhaver **Issue ID** 5

Subject: Draft WSS set
From: ralph kopenhaver
Date: 9/18/96 9:06 AM

Based on the draft set distributed at the ES&H Policy Team Meeting below are my comments:

The placement of the ACGIH TLVs as an implementation assumption also gives me some concerns. In this case, we are placing a newer, and generally stricter, standard in the implementation assumptions rather than the set itself. I'm not sure what it means to have a standard (that is completely a numeric standard) as an implementation assumption. If compliance with these stricter numeric standards is necessary for adequate protection of the worker, why are they not a part of the set. If they are not necessary, why are they an implementation assumption. I do not understand how a basic standard such as TLVs or PELs can be an implementation assumption, to me they define the basic standard necessary for protection of the worker.

****

Response:
This issue was the subject of ongoing discussions in the Lab. Safety Team for several weeks. The ACGIH TLVs were included as an external standard in the WSS set. PGWilliams. 10/16/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ OG ☒ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ron Pauer

Air Emissions **Issue ID** 8

Includes issues identified by work and hazard analysis:
BAAQMD Permitted Source
Non Permitted Discharges to Air/Water

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

Clean Air Act, 42 USC 7401 et seq.
40 CFR 61, Subpart H, National Emission Standards for Emissions of Radionuclides Other Than Radon From DOE Facilities
40 CFR 50-88, Chapter 1, Subchapter 2, Air Programs
40 CFR 260-271, Subpart AA & CC (RCRA)
California Clean Air Act, Health and Safety Code 39000 et seq. (Air Resources)
17 CCR, Division 18 Air Resources Board (stationary and mobile sources)
BAAQMD Regulations 1 through 12, BAAQMD Manual of Procedures - and all permits pursuant

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ◉ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ◉ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

NESHAP FFCA Stack Sampling Compliance Strategy (previously developed and agreed upon by DOE and EPA).

14. **Provide basis for selected standard(s).**

For non-radiological emissions: BAAQMD has been authorized by the California Air Resources Board and the US Environmental Protection Agency to regulate air emissions from certain stationary sources in accordance with state and federal regulations. The BAAQMD standards set ensures compliance with relevant sections in Parts 50, 58, 60, 70-72, 75 of Title 40 of the Code of Federal Regulations. Since BAAQMD regulations refer to routine activities, 40 CFR Part 68 has been included to address accidental release prevention requirements. Excluded from this set are standards for ozone-depleting substances and asbestos, both of which are covered in separate issues.

For radiological emissions: necessary standards are required in 40 CFR 61 Subpart H and it prescribes ANSI N 13.1 (1969), Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities.

15. **Provide assumptions for implementation of standard(s).**

Berkeley Lab will continue to follow the stated standards as it conducts its air quality program and implementation should not result in any impact.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg; Mike Schoonover

Air Emissions (NESHAPS) **Issue ID** 9

Minor
Put ANSI N13.1 (1969). Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities in implementation.

****

Response:
This standard was moved to implementation, as suggested. PGWilliams. 10/16/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Asbestos - worker and environmental protection. **Issue ID** 10

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

Clean Air Act, 42 U.S.C. 7401 et seq.
40 CFR 61, Subpart M, National Emission Standard for Asbestos and Subpart F, Appendix A
BAAQMD Regulation 11, Rule 2, Asbestos
29 CFR1910.1001, Asbestos (general industry); 29 CFR 1926.1101, Asbestos (construction activities)
Occupational Safety and Health Act, 29 U.S.C. 668 et seq.

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The regulatory standards provide a comprehensive set for environmental and occupational worker protection. 29 CFR 1910.1001 addresses asbestos concerns for the general work environment, and 29 CFR 1926.1101 is specific for construction activities. BAAQMD Regulation 11, Rule 2 incorporates the federal environmental regulations of 40 CFR 61, subpart M regarding asbestos removal activities.

15. **Provide assumptions for implementation of standard(s).**

Berkeley Lab will maintain its present asbestos management program to comply with necessary legal requirements.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Aviation **Issue ID** 11

*Moderate
No Change

Clarification, addressed in the set. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Blodgett; Rick Schwarz

Biological, Animal Handling **Issue ID** 13

Animal handling includes management of the welfare of animals in research a disease prevention from infected animals. The scope of application of this issue is limited to the use of dogs, rabbits, mice and monkeys.

Also see the Following ITD sheets for related issues/standards:
Lab ID Team - Infectious Agents
Accelerator ID Team - Hazardous Material Handling
Environment ID Team - Hazardous Materials Inventory and Transportation

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

9CFR - Chapter I, Animal and Plant Inspection Service, Department of Agriculture
7USC2131-2157 - Animal Welfare Act (Transportation, Sale, and Handling of Certain Animals)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Federal standards stated provide adequate coverage for the care and use of animals in research.

15. **Provide assumptions for implementation of standard(s).**

National Consensus standards and guidelines, in collaboration with stated legal requirements, are accepted as best management practice for working safely with animals and establishing humane treatment. Examples include:

USDA License - Animal and Plant Inspection Services, 1992.
National Research Council (NRC) - Guide for the Care and Use of Laboratory Animals
American Industrial Hygiene Association (AIHA) Biosafety Reference Manual

This framework has been noted as very successful in allowing work to proceed safely at similar R & D institutions.
PUB -3000, Chapter 22, describes Berkeley Lab requirements governing the care and use of research animals.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Blodgett

Biological, Bloodborne Pathogens **Issue ID** 14

Bloodborne pathogens (BBP's) are viruses, bacteria, and parasites that are present in human blood or other body fluids. The scope of the application of this topic is limited to employees who could be reasonably anticipated as a result of performing their job duties, come into contact with blood and other potentially infectious materials. Some examples of BBP's which may be present at the Berkeley Lab are: Hepatitis B virus, Human Immunodeficiency virus and Treponema pallidium (causes syphilis).

Also see the following ITD sheets for related issues/standards:
Lab ID Team - Infectious Agents and Local Exhaust Ventulation
Accelerator ID Team - Hazardous Material Handling
Environment ID Team - Hazardous Materials Inventory and Transportation (Tracking and Management of Medical Waste (40 CFR 259) and Interstate Shipping of Etiological Agents (42 CFR 72), DOT Infectious Agents (49 CFR 171)

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

OSHA 29CFR1910.1030, Bloodborne Pathogens

6. **Were any non-value aspects of the legal requirements identified?** ◉ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

Annual requirement for BBP re-training

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The OSHA Standard (29CFR1910) prescribes requirements for health and safety in the workplace. Specifically, 1910.1030 addresses work practices, controls, and training in a laboratory environment for employees working with bloodborne pathogens.

15. **Provide assumptions for implementation of standard(s).**

The combination of legal requirements and recognized consensus standards and guidelines form adequate and appropriate safety envelope for Berkeley Lab use of bloodborne pathogens. Examples include:

CDC/NIH - Biosafety in Microbiological & Biomedical Laboratories
CPL 2-2.44C, Federal OSHA Instruction Enforcement Procedures for Bloodborne Pathogens
American Industrial Hygiene Association (AIHA) Biosafety Reference Manual

This framework has been noted as very successful in allowing work to proceed safely at similar R & D institutions. Research at the Berkeley Lab includes use of human blood which is potentially infectious, there is also the potential for exposure by the phleobotomists who draw human blood, and emergency responders. PUB-3000, Chapter 4,

contains general bloodborne pathogen information and PUB-5341, Chemical Hygiene and Safety Plan (CHSP), includes an overview of engineering controls. PUB-3095 contains guidelines for biohazardous and medical waste generation.

There is an identified need for establishing a Berkeley Lab Comprehensive Biosafety Manual that includes a system of laboratory biohazard level identification system commensurate with the degree of risk (e.g., Levels 0-2 for perceived biohazard to real biohazard).

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☒ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Blodgett; Rick Schwarz

Biological, Human Subjects **Issue ID** 15

The scope of human use research includes: physical participation in an activity; donation of tissues, organs, fluids or other body fluids; the use of human derived data or cultures of human cells; etc.

Also see the Following ITD sheets for related issues/standards:
Lab ID Team - Bloodborne Pathogens, Infectious Agents, Radiation - Human Use (to be developed)
Accelerator ID Team - Hazardous Material Handling
Environment ID Team - Hazardous Materials Inventory and Transportation (Tracking and Management of Medical Waste (40 CFR 259) and Interstate Shipping of Etiological Agents (42 CFR 72), DOT Infectious Agents (49 CFR 171)

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

10 CFR 745 - Protection of Human Subjects (DOE)
45 CFR 46 - Protection of Human Subjects (DHS)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Federal standards offer adequate coverage for the nature and extent of applicable activities at the Berkeley Lab.

15. **Provide assumptions for implementation of standard(s).**

DOE guidelines, in collaboration with stated legal requirements, provide a basis for implementation of working safely with human subjects. Examples include:

DOE Implementation Guide 4300.2C Work for Others

PUB -3000, Chapter 22, describes Berkeley Lab requirements governing the use of human subjects.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Blodgett; Rick Schwarz

Biological, Infectious Agents **Issue ID** 16

Infectious agents are viruses, bacteria, and parasites that may be present in the laboratory and cause associated diseases. The scope of the application of this topic is limited to employees who could be reasonably anticipated as a result of performing their job duties, come into contact with an infectious agent. Some examples of potentially infectious agents which may be present at the Berkeley Lab are: vaccinia virus, cholera, malaria, some cell lines, recombinant-DNA, etc.

Also see the Following ITD sheets for related regulations: Lab ID Team - Bloodborne Pathogens and Local Exhaust Ventilation; Accelerator ID Team - Hazardous Material Handling; Environment ID Team - Hazardous Materials Inventory and Transportation (Tracking and Management of Medical Waste (40 CFR 259) and Interstate Shipping of Etiological Agents (42 CFR 72), DOT Infectious Agents (49 CFR 171)

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ◉ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ◉ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

NIH - Guidelines for Research involving DNA Molecules
CDC/NIH - Biosafety in Microbiological & Biomedical Labs

11. **Are the previously identified standard(s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ◉ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

Berkeley Lab will develop internal standards to address the issues covered by the external standards included above. After those standards have been developed, the external standards will be used only as guidance.

14. **Provide basis for selected standard(s).**

In lieu of established regulations, the NIH and CDC guidelines provide germane coverage of all Berkeley Lab research where infectious agents are involved. See box 1 for details.

15. **Provide assumptions for implementation of standard(s).**

The nationally recognized guidelines (NIH and CDC) form adequate requirements for facility design, engineering controls, work practices, and training for the use of infectious agents at the Berkeley Lab. Additionall, the most current version of American Industrial Hygiene Association (AIHA) Biosafety Reference Manual can be used as well.

This framework has been noted as very successful in allowing work to proceed safely at similar R & D institutions. Research at the Berkeley Lab includes a few locations where biosafety level (BSL) 2 controls are in-place. PUB-3000, Chapter 4, contains general infectious agent information and PUB-5341, Chemical Hygiene and Safety Plan (CHSP), includes an over view of engineering controls. PUB-3095 contains guidelines for biohazardous and medical waste generation.

A comprehensive PUB - 3000 Chapter on Biosafety, incorporating the applicable portions of the NIH and CDC

guidelines needs to be developed, i.e., a Berkeley Lab Biosafety Manual. It would include information such as a biohazard level identification system for laboratories commensurate with the degree of risk for the work that is performed (e.g., Levels 0-2 for perceived biohazard to real biohazard). Once this document is established, the NIH and CDC Guidelines would no longer be external standards.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☒ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Blodgett

Biological, Infectious Agents - Confirmation Team **Issue ID** 17

ISSUE: Recombinant DNA guidelines needed per McKinney
Bob McKinney, NIH

Dr. McKinney pointed out that these guidelines have extra force, since Institutions not using these guidelines or similar will not be funded by DHHS for recombinant DNA work.

****

Response:
This standard was included in the WSS set as an external standard. PGWilliams. 10/16/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

This standard has already been included.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rick Kelly; Jack Salazar

Chemical Carcinogens **Issue ID** 20

These refer to chemicals that are defined by their ability to cause neoplasms (tumors) in humans and/or animals. This category encompasses all applicable categories of carcinogenicity (i.e., confirmed, suspected, animal); that is, the specific scope (consistent with the Laboratory Standard, 29CFR 1910.1450) is comprised of chemicals referenced as OSHA regulated carcinogens, National Toxiclogy Program (NTP) "known to be carcinogens," and International Agency for Research on Cancer Monographs (IARC) Group 1 ("carcinogenic to humans"). Chemicals noted under IARC 2A/2B and NTP "reasonably anticipated to be carcinogens" categories are included base upon statistically significant evidence of tumor incidence in animals through experimentation. This issue is limited to considerations associated with the use, storage of chemical carcinogens, along with the application of suitable control measures. Examples of chemical carcinogen use at LBNL involve laboratory scale use of benzene, chloroform, carbon tetrachoride, and gram quantities of nickel and nickel compounds. In addition, potential exposure to carcinogens such as lead in support operations/activities is also seen at LBNL.

The handling of asbestos in buildings, asbestos air emissions and asbestos waste are not considered here (refer to IT sheet entitled, "Asbestos - Worker and environmental Protection").

See also the following associated Identification Team issues:
For hazardous waste issues refer to "Waste, Hazardous and Mixed (non-radioactive component)" and for mixed waste issues refer to "Waste, Radioactive and Mixed (radioactive component)".
For transportation issues, refer to "Hazardous Material Transportation - Offsite" and "Hazardous Material Transportation - Onsite,"Material Transportation," and "Hazardous Materials Inventory and Transportation."
Hazardous Material Handling

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910 Subpart Z (1910.1001-Asbestos; .1003, 4-nitrobiphenyl; .1004, alpha-napthylamine; .1006, methyl chloromethyl ether; .1007, 3,3 dichlorobenzidine; .1008, bis-chloromethyl ether; .1009, beta napthylamine; .1010, benzidine; .1011, 4-aminodiphenyl; .1012, ethyleneimine; .1013 beta-propiolactone; .1014, 2-acetylaminofluorine; .1015, 4-dimethylaminoazobenzene; .1016 N-nitrosodimethylamine; .1017, vinyl chloride; .1018 arsenic; .1025 lead (carcinogenic compounds of lead); .1028 benzene; .1044 DBCP; .1045 acrylonitrile; .1047 ethylene oxide; .1048 formaldehyde; .1050 cadmium.)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CAC Title 24, Part 9, California Fire Code Article 80 (Hazardous Materials)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

14. Provide basis for selected standard(s).

The substance-specific standards in 29 CFR 1910 Subpart Z provide detailed coverage for these materials in areas including, medical surveillance, exposure monitoring, training, emergency procedures, decontamination and disposal, and requirements for facility safety features; these requirements are applied on a substance-specifc (case-by-case) basis in consideration of the factors involved in the individual use of any given material and do not contain universal provisions. The more comprehensive 29CFR 1910.1200 (Hazard Commincation) and principally the 29CFR 1910.1450 (Laboratory Standard) provisions address work practices, controls, and training applied on a performance basis for all work at LBNL in a laboratory setting (as referenced from the Hazardous Materials Handling ITD sheet). The substance-specific portions, along with the broader .1200 & .1450 portions of 29 CFR, provide an effective safety umbrella for the work occurring with chemical carcinogens in both laboratory and support operation environments at the Berkeley Lab.

The CFC references in Box #10 prescribe related requirements for applicable chemical carcinogens.

15. Provide assumptions for implementation of standard(s).

In addition to the legal requirements noted above, other pertinent references below are noted as necessary in order to implement an effective Carcinogen Control Program at the Berkeley Lab. These include:
- ACGIH "Guidelines for the Classification of Occupational Carcinogens" (6th edition of Documentation of TLVs) as well as Appendix A: Carcinogenicity guidance on application of carcinogen classifications and minimizing of exposures to chemical carcinogens (TLV for Chemical Substances, latest edition).
- Biological Exposure Indices (BEIs) that provide occupational health professionals a means for assessing worker exposure to identified carcinogens (e.g., benzene, lead).
- Chemical Hygiene and Safety Plan (PUB-5341) for LBNL identifies the pertinent elements and mechanisms in a comprehensive manner to be able to implement effective measures governing the use, storage, and control of chemical carcinogens (e.g., carcinogen use survey forms, procurement/prior approval mechanisms).
- Examples of other applicable consensus references can be found on the Hazardous Material Handling ITD.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ron Pauer; Jack Salazar

Chemical Inventory - Jeff Beeman **Issue ID** 21

Date: 8/30/96 11:02 AM
Thanks for asking about the N&S issues. One of our biggest headaches is the chemical inventory. The group leader doesn't want to put his name down as the responsible person, since he can't keep track of what people are bringing in. He thinks that if someone makes a bomb, he will be responsible. Individual grad students and scientists don't want to take the time to fill out the forms, etc.
Since most of the quantities we handle are small, I would do away with the chemical inventory, or at least set some quantity limits. Everything over one gallon or one Kg could be inventoried, for example. All small quantities would be exempt.
Another idea that I like is to have a chemical inventory team. If a researcher does not want to keep up with his chemical inventory, he/she could pay the team via an account number to make periodic sweeps through his lab. If another researcher is cheap (or more ambitious), that person has the option to keep the records current himself. Personally, I would rather give an account number to an inventory team than do it myself.
My 2 cents worth,
Jeff Beeman
****
Response:
Standards will allow more efficient implementation. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team
   Group ☐ F ☐ A ☒ E ☒ LS ☐ OG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No
   If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No
   If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No
   If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No
   If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No
   If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No
    If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

    ☐ Major positive impact ☐ No net impact ☐ Major negative impact
    ☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rob Connelly

Compressed Gases **Issue ID** 22

Research at the Berkeley Lab requires the use of a variety of compressed gases and gas systems. This issue covers the general and construction industry standards for the safe use of compressed gases, inspection of cylinders, manifolds, and compressed gas systems, welding and cutting with compressed gases, storage, etc.

This issue also covers the Lab. Safety ID Team IFA issue:
Pressure Equipment - Compressed Gas Cylinders

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910.101 (Compressed Gases - General Requirements)
.102 (Acetylene)
.103 (Hydrogen)
.104 (Oxygen)
.110 (Storage and handling of liquified petroleum gases)
.253 (Oxygen fuel gas welding & cutting)
.120(q) Emergency Response
Subpart C: General Safety and Health Provisons
Subpart I: Personal Protective Equipment
29 CFR 1926 .350 (Gas welding and cutting)
.306 (Air receivers)
.153 (Liquified petroleum gas)
.55 (Gases, vapors, etc.)
Subpart C: General Safety and Health Provisions
49 CFR 171 - 179, Storage & Transportation guidance

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CAC Title 24, Part 9, California Fire Code, Article 49, Welding & Cutting
CAC Title 24, Part 9, California Fire Code, Article 74, Gases
CAC Title 24, Part 9, California Fire Code, Article 80, Hazardous Materials
CAC Title 24, Part 9, California Fire Code, Article 51,Semi-conductor fabrication
CAC Title 24, Part 9, California Fire Code, Article 82, Liquified petroleum gas

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Implementation of a wide variety of regulations, standards, and guidelines is needed to properly control compressed gas uses.

15. **Provide assumptions for implementation of standard(s).**

PUB 3000, Chapter 13 (Gases) and Chapter 7 (Pressure Safety) are based on the above listed standards and will be

used as guidance in implementing the required standards. The following additional standards and guidelines will be used:
Compressed Gas Association CGA-P-1-1991, Safe Handling of Compressed Gases in containers
ANSI B57.1/CGA Compresses Gas Cylinder Valve Outlet & Inlet Connections
ANSI Z9.5 (Laboratory Ventilation)
NFPA 45 (Fire Protection for Laboratories using Chemicals)
NFPA 50A (Gaseous Hydrogen Systems)
NFPA 51B (Welding & Cutting Process)
NFPA 55 - Compress and Liquefied Gases in Portable Containers
NFPA 72 (Installation, Maintenance, and use of Protective Signaling Systems)
ACGIH Industrial Ventilation Manual
ANSI/UL 407 (Standard for safety for manifolds for compressed gases)
CGA (Handbook of compressed gases)
CGA C-6 (Standards for visual inspection of compressed gas cylinders)
CGA S-1.1 (Safety releif device standards-cylinders for compressed gases)
NFPA 49 (Hazardous chemicals data)
NFPA 50B (Liquefied hydrogen systems)
NFPA 51 (Oxygen-fuel gas systems for welding, cutting)
NFPA 52 (Compressed natural gas (CNG) vehicular fuel systems)
NFPA 55 (Storage, use, handling of compressed and liquified gases in portale cylinders)

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Davis

Confined Space **Issue ID** 24

IFA Issue - Confined Space

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910.146 OSHA General Industry Standards

29CFR 1926.21, .352, .353 OSHA Construction Industry Standards

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Standards identified in section 5 establish a comprehensive set of requirements that provide adequate safety and health protection for confined space hazards, while meeting legal requirements.

15. **Provide assumptions for implementation of standard(s).**

The current LBNL Confined Space Program already follows these identified standards. No additional implementation or actions are required.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Construction **Issue ID** 25

@ Major
CCR Title 8, For construction only (where more stringent).

Wording added to the set. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Johnson

Construction Safety **Issue ID** 27

Facilities Issues - compressed gases, demolition, dewatering hazard, earth cave-in & collapse, earth clearing, earth moving equipment, equipment, fall hazards, hand tools, heavy equipment, high winds, ladder, materials, handling, possibility of hitting utilities, scaffolding, transportation.
IFA Issues: Construction - Equipment for earth moving equipment
Construction - Equipment for equipment
Construction - Equipment for hand tools
Construction - Equipment for heavy equipment
Construction - Equipment for ladders

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1926 OSHA construction industry standards
29 CFR 1910 General Industry Safety Orders

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CCR Title 8 California Construction Safety Orders

Note: CCR Title 8 shall be applied to subcontracted construction work only and only in those instances where it is more stringent.

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The identified standards in section 5 & 10 establish a comprehensive set of requirements that provide sufficient safety and health protection for the recognized hazard while meeting legal requirements.

15. **Provide assumptions for implementation of standard(s).**

The LBNL EH &S program follows the identified standards. No additional implementations activities are required. The ANSI and Title 8 (California Code of Regulations) can be used as additional guidelines where appropriate.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Chris Donahue; Roger Kloepping; Edwin Njoku; Mike

Control of Radioactive Sealed Sources **Issue ID** 28

This issues covers requirements for use of radioactive material sealed sources. Sealed sources are specially made for utilization of the emitted radiation. The radioactive material is contained in such a way to prevent leakage or escape of the material under normal circumstances. Requirements include leak testing and inventory accountability.

Related issues:
Lab ID Team : Radiological Protection Program; Accelerator ID Team: On site exposure

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

10CFR835

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CAC 17 Section 30275

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Legal requirements are mandated, but sealed sources are not addressed in 10 CFR 835. DOE Notice 441.1 supplements 10CFR835 in the area of sealed source control. However, thresholds for leak test requirements and accountability in the DOE Notice are arbitrary and overly conservative. CCR 17 addresses sealed sources in a manner consistent with California externally regulated facilities. LBNL is a user facility and controls should be consistent with externally licensed facilities.

15. **Provide assumptions for implementation of standard(s).**

Implement the requirements of 10CFR835 similar to the implementation of 10 CFR 20 in industry (CCR 17 in the case of California) . The detailed RPP based on the selected standards will address the hazards to this particular site and will contain enforceable controls that comply with the regulation, but are tailored to site hazards. The leak test requirements from CCR 17 will be in the RPP and in Pub. 3000. Also included will be accountability limits, based on ALARA, standard industry practice and authorization requirements. Other special requirements will also be addressed.
One example: All sources that emit alpha particles that are required to be leak-tested, will be tested on a quarterly basis.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☒ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg; Mike Schoonover

Control of Radioactive Sealed Sources **Issue ID** 29

Minor
Add DOE nuclear material accountability standards.

****

Response:
Although it arose in the context of sealed sources, this issue is not only related to "Control of Radioactive Sealed Sources". The DOE Nuclear Materials Management and Safeguards System (NMMSS) Order (5633) is relevant to all nuclear materials used at LBNL. A new issue form named "Nuclear Materials Management" was created to address this issue. PGWilliams. 10/16/96.

Already included in the contract as Safeguards and Securities order. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Jack Bartley

Controlled Substances **Issue ID** 30

Controlled substances are used at Health Services in the course of medical treatment and in the conduct of human and animalexperimentation by qualified physicians and veterinarians, respectively. The substances in question are under lock and key except when in use. The quantities in inventory and utilized are logged. Periodic audits of the conditions for use and storage are conducted by the outside regulatory agency (State of California Department of Helath Services). Examples of chemcals in this category are narcotics, barbiturates, morphine, cocaine, and ultrapure ethyl alcohol.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

21 CFR 1308 - Controlled Substances

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Existing regulation is a legal requirement that is currently being met by the Laboratory.

15. **Provide assumptions for implementation of standard(s).**

Existing program of control will continue with appropriate oversight both internal and external to Laboratory.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. Issue (s) Resp. Person Paul Blodgett

Corrosive | Issue ID 31

A corrosive chemical is defined as a substance that irritates or destructively attacks organic tissue (skin, eye, mucous membranes). The scope of the application of this topic is limited to storage, use, and control of corrosive solid and liquid chemicals. Some examples of corrosives stored or in use at the Berkeley Lab are: glacial acetic acid, hydrochloric acid, hydrofluoric acid, sulfuric acid, sodium hydroxide, etc.

Also see the following ITD sheets for related issues/standards:
Accelerator ID Team - Hazardous Materials Handling

2. Issue Origin ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☐ CT

3. Is there a legal requirement (s) which applies to this issue? ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. Is a standard necessary to ensure adequate protection? ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. Necessary legal requirement (s)

OSHA 29CFR1910.1000, Air Contaminants, Permissible Exposure Limits (PEL's)
OSHA 29CFR1910.151, Medical Services and First Aid

6. Were any non-value aspects of the legal requirements identified? ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. Description of non-value added aspects of the legal requirement (s).

8. Is the legal requirement (s) sufficient? ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. Is there a non-required external standard(s) which addresses this issue? ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. External necessary standard(s)

CAC Title 24, Part 9, California Fire Code Article 80 (Hazardous Materials)

11. Are the previously identified standard(s) sufficient? ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. Are the relevant internal standard(s) sufficient? ○ Yes ○ No

13. Describe internal standard(s) or describe new standard(s) to be developed.

14. Provide basis for selected standard(s).

The OSHA Standard (29CFR1910) prescribes requirements for health and safety in the workplace. Specifically, 1910.1000 lists exposure limits for airborne contaminants and 1910. 151 requires an emergency eyewash and shower where corrosives are handled while more comprehensive Standards such as 1910.1450 (Lab Std.) addresses work practices, controls, and training in a laboratory environment (as referenced from the Hazardous Materials Handling ITD sheet).

The CFC prescribes general requirements for storage, handling, and containment of corrosive chemicals.

15. Provide assumptions for implementation of standard(s).

The combination of legal requirements and recognized consensus standards form an adequate and appropriate safety envelope for Berkeley Lab use of corrosives. This framework has been noted as very successful in allowing work to proceed safely at similar R & D institutions. The Berkeley Lab use of corrosives is limited to small-scale research applications involving relatively small quantities of corrosives. PUB-5341, Chemical Hygiene and Safety Plan (CHSP) covers comprehensive chemical storage, use, and control guidelines. Examples of the consensus standards are included on the Hazardous Material Handling Sheet.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Blodgett

Cryogenic Materials and Use **Issue ID** 32

A cryogen is defined as a gas that has been transformed into an extremely cold liquid with a boiling point below (-90°C). These liqiuids can be simple asphixiants such as liquid nitrogen, have flammable properties such as liquid hydrogen or carbon monoxide, or toxic properties such as carbon monoxide or flourine. The scope of the application of this topic is limited to future storage, use (in cold traps and pipes or tubing), and control of cryogenic chemicals. Some examples of cryogens that are used at the Berkeley Lab are liquid nitrogen and liquid hydrogen.

Also see the following ITD sheets for related issues/standards:
Lab ID Team - Compressed Gases, Toxic Chemicals, Highly Toxic Chemicals, Flammable Materials
Accelerator ID Team - Hazardous Materials Handling
Environment ID Team - Hazardous Materials Management and Transportation and Hazardous Waste and Mixed Waste (nonrad component) and Hazardous Materials Inventory & Transport.
Facilities ID Team - Confined Spaces

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

OSHA 29CFR1910.1000, Air Contaminants, Permissible Exposure Limits (PEL's)
OSHA 29CFR1910.103, Hydrogen

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CAC Title 24, Part 9, California Fire Code Article 75 (Cryogens)
CAC Title 24, Part 9, California Fire Code Article 80 (Hazardous Materials)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The OSHA Standard (29CFR1910) prescribes requirements for health and safety in the workplace. Specifically, 1910.1000 lists exposure limits for airborne contaminants and 1910.103 list requirements for work with hydrogen while more comprehensive Standards such as 1910.1450 (lab Std.) addresses work practices, controls, and training in a laboratory environment (as referenced from the Hazardous Materials Handling ITD sheet).

The CFC prescribes requirements for cryogens handling, container design, storage, and piping.

15. **Provide assumptions for implementation of standard(s).**

In concert with the legal requirements, the consensus standards and guidelines listed in the Hazardous Material Handling ITD sheet should provide an adequate basis for the foreseeable situations at LBNL. This framework has been noted as very successful in allowing work to proceed safely at similar R & D institutions. PUB-5341, Chemical Hygiene and Safety Plan (CHSP) covers comprehensive chemical storage, use, and control guidelines.

Additionally, PUB-3000, Chapter 7, describes Berkeley Lab requirements governing the use of cryogens and Chapter 5 of the Handbook of Compressed Gases by the Compressed Gas Association details handling considerations.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg; Paul Blodgett

Cryogenic Materials and Use **Issue ID** 33

Minor
LBNL will look into publishing implementation guidelines from PUB 3000.

****

Response:
This issue was discussed by the Lab. Safety Team. It wasdecided that the PUB-3000 chapter was inappropriate for general publication in its current form. PGWilliams. 10/16/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Cultural Resources **Issue ID** 37

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ◉ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ◉ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The regulations require DOE to identify archaeological and historical resources present on their property and to take proper steps to preserve or other wise mitigate impacts to such resources. Additionally, DOE must consider the effects of their actions on archaeological and historical resources located on other lands. The current practice is for the Berkeley Lab to voluntarily assist DOE to meet this requirement. However, no standards were selected because no formal agreement exists.

15. **Provide assumptions for implementation of standard(s).**

The Berkeley Lab will continue to voluntarily assist DOE to comply with these standards:
The National Historic Preservation Act, 16 U.S.C. 470
Archaeological and Historic Preservation Act, 25 U.S.C. 469
36 CFR 60, National Register of Historic Places; 63, Determinations of Eligibility; 65, National Historic Landmarks Program; 800, and Protection of Historic and Cultural Properties.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

DOE Order 6430.1A - SRC **Issue ID** 41

* Is DOE Order 6430.1A in Building and Facilities Safety still applicable to LBNL?
Phil Roebuck noted the LCAM order supersedes 6430.1A at LBNL. The discussion noted if the CFR specifically calls out 6430.1A then the CFR reference is all that is needed in the set. The agreement is to remove 6430.1A.

ACTION: Lab Safety Team to consider revising Issue Forms

This is not a Lab. Safety Team issue. Phil Williams 09/26/96.
LCAM order replaced 6430.1A in set. Ben Feinberg 11/10/96

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☒ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Davis

Drinking Water **Issue ID** 42

IFA Issue - None

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

40 CFR 141,142 , 143 EPA Primary and Secondary Drinking Water Standards

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The standards identified in section 5 establish a comprehensive set of requirements that provide adequate protection for drinking water, while meeting legal requirements.

15. **Provide assumptions for implementation of standard(s).**

The current LBNL Drinking Water program already follows these identified standards, no additional implementation activities are required. CCR Title 17 is currently cited as a standard in the LBL Drinking Water Program.

The documents listed below are used to aid in the implementation of these standards.

LBNL Pub 3000, chapter 4

ANSI / AWWA C651-86 Standard for Disinfecting Water Mains
(American Water Works Association)

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Keith Gershon

Electrical Safety **Issue ID** 45

Custom Built Electrical Equipment
Heat Tapes
High Current Power Supplies (>30 amp)
High Voltage Lasers
High Voltage Power Supplies (>600V, 5mA)
Maintenance/Repair of Equipment with Electrical Components >120V
Maintenance /Repair of Equipment with Electrical Components of 120V or less
Maintenance/Repair of Equipment with Capacitors

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910.301 - 399 (Subpart S - Electrical)
29 CFR 1910.147 (Lockout/Tagout)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

NFPA 70 - National Electrical Code, as appropriate
NFPA 70E - Electrical Safety Requirements for Employee Workplaces

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

All requriements identified are legal requirements or nationally recognized standards (#10). Requirements do not always appropriately match scientific applications. These codes/regulations are to be applied where appropriate as determined by the LBNL Authorities Having Jurisdiction, AHJ.

15. **Provide assumptions for implementation of standard(s).**

Local Authority Having Jurisdiction (AHJ) must be clearly empowered to interpret applicability of code subsections to scientific work.

The following guidelines have been developed by LBNL experts to apply, specifically to scientific work:
LBNL Engineering Specs
PUB 3000 Chapter 8 - Electrical Safety

The following documents provide appropriate guidelines for specific work practices at LBNL:
ANSI C2 - National Electric Safety Code
NFPA 70B-Electrical Equipment Maintenance
UL/ANSI Standards: 508, 1262, 3101-1
PUB 3000, Chapter 18- Lockout/Tagout

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☒ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg; Keith Gershon

Electrical Safety **Issue ID** 46

*Moderate
Items in box #7 belong in box #14.

****

Response:
This issue was dealt with as advised. PGWilliams. 10/16/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Keith Gershon; Don Rondeau; Rich Haddock; Jack

Electrical Safety Issues - SRC **Issue ID** 48

* Should we include LBNL specifications for electrical safety into the set, for instance where there are no standards on accelerator interlocks, LBNL has written its own standard?
Jack Bartley agreed we should get input from the SRC Electrical Safety Committee Chair on this issue this week to make specific decisions on the set. Specifically, Chapters 8, 18, 21 of Pub3000 and LBNL engineering specs of DOE Electrical Safety Guidelines, Sec. 10 will be considered for removal from the set.

ACTION: Jack Bartley to get issue forms to Don.

* Custom Built Equipment should be listed as a separate section in the set
The discussion included the need to identify this as a separate oversight area and to more precisely list the standards for non-standard research equipment within it, since this is often an area of confusion for outside auditors. It is problematic for the researchers to mix these standards in with general issues.

ACTION: Jack work with Don to revise Categories in Set .

****

Response:
Electrical Safety issues were all revisited. Keith Gershon combined all electrical safety issues onto one IT sheet, titled "Electrical Safety". PUB-3000 documents, LBNL engineering specs and DOE Electrical Safety Guidelines were included as implementation guidance, as advised. The oversight structure required by the law, and implemented through an LBNL Authority Having Jurisdiction, appropriately addresses all electrical equipment on-site, and it was thought to be counter-productive to have a separate issue for Custom Built Electrical Equipment. The current administrative structure includes all electrical activities under one umbrella. PGWilliams. 10/16/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☒ F ☒ A ☐ E ☒ LS ☐ OG ☐ PC ☒ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Emergency Preparedness | **Issue ID** 52

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910.38, Employee Emergency Plans; 1910.120, Hazardous Waste Operations and Emergency Response; 1910.165, Employee Alarm Systems.
40 CFR 68, Chemical Accident Prevention Provisions (CAA)
40 CFR 355, Emergency Planning and Notification (SARA Title III)
To the extent involving prevention of accidental releases to air: Health & Safety Code Div 20, Ch. 6.95, Art 2, implementing OES regulations at Title 19 CCR and COB M.C. 11.52.140(B) and Oakland C.M.S. Art 12, Ch 2 adopting H&S Code Div 20, Ch 6.95, Art. 2.
Note: For issues regarding aboveground storage tanks, underground storage tanks, hazardous wastes or accidental releases, also refer to these standard ID documents.

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

NFPA 1600, Disaster Management
Health & Safety Code Div 20, Ch 6.95, Art 2, implementing OES regulations at Title 19CCR, and COB M.C. 11.52.140(B) and Oakland C.M.S., Art. 12, CH 2, adopting Health & Safety Code Div. 20, Ch. 6.95, Art. 2 even if not involving prevention of accidental releases to air.

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The Berkeley Lab emergency preparedness program is based on response to credible scenarios which include: earthquake on the Hayward Fault, wildland fire in the Oakland/Berkeley Hills and small spills or releases of hazardous materials. The Lab is similar to a light industrial facility or university campus with similar hazards. The Lab shares with the local jurisdictions the same hazards, response challenges and similar resources therefore adopting similar standards allows the Lab the be consistent with the state and local emergency planning process. Lab emergency management staff participate in drills and exercises with the City of Berkeley, Oakland, Alameda county and the University. The Lab's Fire Department participates in a state- wide mutual aid program. The Lab participates in a University of California system-wide emergency management council. The standards listed above are commonly used among all the participating agencies listed herein.

15. **Provide assumptions for implementation of standard(s).**

Standards listed, with the exception of NFPA 1600, are current standards used by the Lab. The California Health and Safety Code and local risk management prevention plan requirements are legally required to the extent involving prevention of accidential releases to air. NFPA 1600 closely mirrors current operating practices and a comparison of NFPA 1600 standards and current procedures will have a minor positive impact because this standard is simply more appropriate for this type of facility.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☒ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Emergency Preparedness **Issue ID** 53

*Moderate
No change

Clarification of a question, already addressed in the set. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Endangered Species **Issue ID** 54

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

Federal Endangered Species Act, 16 U.S.C. 1531 et seq.
7 CFR 355, Endangered Species Regulations Concerning Terrestrial Plants
50 CFR 17, ESA Rules.

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The Federal Endangered Species Act require Berkeley Lab to ensure that actions we authorize, approve and carry out would not jeopardize the continued existence of threatened or endangered species and their habitat. The Lab contains potential habitat and listed species and contains a species proposed for listing by the state. Although no waiver of sovereign immunity was found in the federal law, DOE voluntarily complies with state requirements and the Berkeley Lab voluntarily assists DOE with this effort. However, the state standards were not selected since their in no formal agreement.

15. **Provide assumptions for implementation of standard(s).**

The Berkeley Lab will continue to maintain its compliance activities at the current level and will continue to voluntarily assist DOE to comply with the state standards:
California Endangered Species Act, 14 CCR 670 et seq.
California Fish and Game Code 2050 et seq.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Environmental Protection Planning (CEQA) **Issue ID** 55

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

California Environmental Policy Act (CEQA), Public Resources Code Sections 21000-2178.1
Title 14 CCR Section 15000 et. seq. (State CEQA Guidelines)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

As a public agency, Berkeley Lab assists the UC Regents in complying with CEQA. Approval authority has been formally delegated to the Berkeley Lab Director from the UC Regents for projects less than $5 million.

NEPA standards specifically state that compliance is the responsibility of federal agencies, such as DOE, and cannot be further delegated; therefore, these were not selected. The current practice is for the Berkeley Lab to assist DOE to comply with NEPA requirements; however, a formal agreement does not exist.

15. **Provide assumptions for implementation of standard(s).**

Berkeley Lab will continue to assist UC to comply with the CEQA standards and to voluntarily assist DOE to comply with the NEPA standards:
42 USC 4321 et. seq., NEPA
40 CFR 1500-1508, Council on Environmental Quality NEPA Implementing Regulations
10 CFR 1021, DOE NEPA Implementing Procedures.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ron Pauer

Environmental Radiation Protection **Issue ID** 56

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ◉ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ◉ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

DOE Order 5400.1, Chapter IV, paragraphs 1.a, 3, 4, 5 (not including 5.a.2.d),6, and 10.c.
DOE Order 5400.5, Chapter II, paragraphs 1 (not including 1.a.3.c and 1.c), 2, 6 (not including 6.a), 7, and 8.a.
Title 22, CCR, Division 4, Chapter 15, Article 5, Domestic Water Quality, Section 64443, Man-Made Radioactivity

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

An industry standard environmental radiation protection will contain standards for all aspects including establishment of dose limits, dose evaluation methodology, effluent monitoring/environmental surveillance, reporting, record keeping and ALARA. An effective program is needed to verify releases to the environment are reasonable. By selecting specific paragraphs of DOE Order 5400.1 and DOE Order 5400.5, the valuable elements are retained and the less valuable elements are eliminated. These programs are required under proposed 10CFR 834. The UC contract includes a performance measure for radiation of the public which establishes a goal of 3 mrem to a maximally exposed hypothetical neighbor.

15. **Provide assumptions for implementation of standard(s).**

Implementation will result in most environmental radiation protection activities being maintained at the current level with the exception of the monitoring program, which will be slightly reduced to a more reasonable level. These activities will most effectively position the Berkeley Lab for compliance with the proposed 10 CFR 834 requirements.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☒ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg; Ron Pauer

Environmental Radiation Protection **Issue ID** 57

Minor
No Change

****

Response:
I don't really know what this issue was about. Ron? PGWilliams. 10/16/96.

Clarification of the standards in the set. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☒ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. Issue (s) Resp. Person

Explosive Fast Acting Valves

Issue ID 59

2. Issue Origin ☐ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. Is there a legal requirement (s) which applies to this issue? ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. Is a standard necessary to ensure adequate protection? ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. Necessary legal requirement (s)

CFR 1910.109 (Explosive and Blasting Agents)
49 CFR 172 (Storage)

6. Were any non-value aspects of the legal requirements identified? ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. Description of non-value added aspects of the legal requirement (s).

8. Is the legal requirement (s) sufficient? ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. Is there a non-required external standard(s) which addresses this issue? ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. External necessary standard(s)

11. Are the previously identified standard(s) sufficient? ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. Are the relevant internal standard(s) sufficient? ○ Yes ○ No

13. Describe internal standard(s) or describe new standard(s) to be developed.

14. Provide basis for selected standard(s).

OSHA requirement

15. Provide assumptions for implementation of standard(s).

Implementation plan of legal requirements will be implemented by changes to PUB 3000.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Pat Thorson

Facilities Design **Issue ID** 60

Facilities Issues : - new facilities design
- existing facilities design modifications

IFA Issues: None

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

48 CFR 970.7104-28 Construction and Architect - Engineer (A-E) contracts.

Note: DOE Order 6430.1 General Design Criteria referenced in the above 48 CFR 970 has been replaced by its successor DOE Orders 430.1 Life Cycle Asset Management (LCAM), and 420.1 Facility Safety

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CAC Title 24, California Building Code

NFPA 101, Life Safety Code

11. **Are the previously identified standard(s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ◉ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

LBNL Design Management Procedures Manual, RD 3.22 Lateral Force Design (Seimic Safety)

14. **Provide basis for selected standard(s).**

The standards identified for this issue provide a comprehensive basis for design activities associated with new and existing structures. The internal design standard for Lateral Force Design (Design Procedures Manual RD 3.22) adresses site specific design requirements for seismic safety. This standard has been in force for an extended period of time. It exeeds the seismic safety requirements of the California Building Code and accounts for the close proximity of the Hayward and San Andreas fault lines to Berkeley Lab.

15. **Provide assumptions for implementation of standard(s).**

The implementation of the above standards will be guided by the LBNL Design Management Procedures Manual LBID - 1662 and the LBNL Health and Safety Manual Pub 3000, Chapter 23, Seismic Safety . There will be no

additional implementation activities required to implement the above standards. The "Authority having Jurisdiction" will enforce and interpret the applicable sections of the Codes & Standards for each specific design activity.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Facility Design **Issue ID** 61

*Moderate
Is DOE 420 a necessary standard ? Yes, it, along with 430 are successor orders for 6430.1. This order has been added to the requirements set under the initial Facilities Design ITD (Jack Bartley).

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. Issue (s) **Resp. Person** Ben Feinberg

Fire **Issue ID** 66

*Moderate
Treat like electrical Authority Having Jurisdiction (AHJ).

Wording added to ID form. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** James Chwang

Fire Protection - Life Safety **Issue ID** 67

Facilities Issues:	General Protection of Employees and the Public ; Means of Egress; Fire Prevention & General Housekeeping
IFA Issues:	Infrared Heaters; Welding, Open Flames

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910 - OSHA General Industry Stamdards
29 CFR 1926 - OSHA Construction Industry Standards

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

NFPA 101 - Life Safety Code
NFPA 1 - Fire Prevention Code
CAC Title 24 Part 9 California Fire Code
CAC Title 24 Part 2 California Building Code

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Standards identified in sections 5 and 10 establish a comprehensive set of requirements that provide adequate life safety protection for the recognized hazard, while meeting legal requirements.
NFPA 101 - Life Safety Code, NFPA 1 - Fire Prevention Code and CCR Title 24 Part 9 California Fire Code are standards for the operation & maintenance of buildings to ensure life safety during fire and similar emergencies.
CCR Title 24 Part 2 California Building Code, provides building design requirements to ensure life safety during fire and similar emergencies in buildings and structures.
These codes/regulations are to be applied where appropriate as determined by the LBNL Authorities Having Jurisdiction (AHJ).

15. **Provide assumptions for implementation of standard(s).**

The implementation of the Fire Protection - Life Safety standards follow DOE Order 440.1 paragraph 2 which establishes the framework for an effective worker protection program in the area of fire safety. In addition the Berkely Lab Health and Safety Manual Pub 3000 - Chapters 12 &13 provide further guidelines to implement the identified standards. No additional implementation / action is required. The authority having jurisdiction will enforce & interpret the applicable sections of the codes & standards.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Fire Protection - Property Conservation, Programmatic Impact, Mission **Issue ID** 68

IFA: Infrared heaters, welding, open flames

* This issue is not in the scope of the ES&H WSS process. It will be addressed in the LBNL risk & property management practices.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ◉ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ◉ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

Applicable NFPA standards
DOE order 420.1 - Facility safety, Paragraph 4.2 "Fire Protection"

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Standards identified in section 10 establish a comprehensive set of requirements that safe guard against property losses, vital programmatic interruptions and release of hazardous or radiological release off-site.

15. **Provide assumptions for implementation of standard(s).**

The current fire protection program at LBNL already follows these identified standards, so no additional implementation / action is required.

- Factory mutual loss prevention data sheets
- DOE fire protection handbook

The authority having jurisdiction will enforce & interpret the applicable sections of the codes & standards.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. Issue (s) Resp. Person

Fire Safety - SRC

Issue ID 69

* Under the category of fire, what does DOE Order 440.1 add to the set?
There was general agreement to remove this order as redundant since it only requires that we have a plan; we need a plan to follow all the other standards under this category. This order can be placed in implementation.

ACTION: Lab Safety Team to consider revision of Issue Forms

This is not a Lab. Safety Team issue. Phil Williams 09/26/96.
Moved to implementation. Ben Feinberg 11/10/96.

2. Issue Origin ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☒ SRC ☐ SH ☐ CT

3. Is there a legal requirement (s) which applies to this issue? ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. Is a standard necessary to ensure adequate protection? ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. Necessary legal requirement (s)

6. Were any non-value aspects of the legal requirements identified? ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. Description of non-value added aspects of the legal requirement (s).

8. Is the legal requirement (s) sufficient? ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. Is there a non-required external standard(s) which addresses this issue? ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. External necessary standard(s)

11. Are the previously identified standard(s) sufficient? ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. Are the relevant internal standard(s) sufficient? ○ Yes ○ No

13. Describe internal standard(s) or describe new standard(s) to be developed.

14. Provide basis for selected standard(s).

15. Provide assumptions for implementation of standard(s).

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Dean Decker; Nancy Rothermich

Flammable and Combustible Liquids **Issue ID** 70

This includes Class I flammable liquids (flashpoint below 100 degrees F), and Class II and IIIA combustible liquids (flashpoint below 200 degrees F).
Included are lab-scale use of flammable/combustible liquids, and facilities dispensing gasoline.

See also the following Environmental ID Team issues:
For hazardous waste issues refer to "Waste, Hazardous and Mixed (non-radioactive component)" and for mixed waste issues refer to "Waste, Radioactive and Mixed (radioactive component)".
For transportation issues, refer to "Hazardous Materials Transportation, Offsite" and "Hazardous Materials Transportation, Onsite".

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910.106,144,108,114,1200, 107,115,178
29 CFR 1926.152,155

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CAC Title 24, Part 9, California Fire Code Article 79 (Flammable & Combustible Liquids)
NFPA 30 (Flammable and Combustible Liquid Code)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The legal requirements in combination with NFPA reference are applicable for the work being performed at LBNL.

15. **Provide assumptions for implementation of standard(s).**

Standards are incorporated and implemented per PUB-5341 and PUB-3000, as well as PUB-3092 and LBNL fire Department requirements.

NFPA 325 - Flammable Liquids, Gases, Volatile Solids, Fire hazard properties of, 1994
NFPA 45 - Fire Protection for Labs using hazardous materials
NFPA 704 - ID of Fire Hazards of Materials

Note: There are seven NFPA "National Codes". All other NFPA codes are considered consensus standards of recommended practice.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rick Kelly

Flammable Gases **Issue ID** 72

Flammable gases are gases (or liquified gases) which may form mixtures with air which are explosive or will support a fire. Examples at LBNL include hydrogen and liquified petroleum gas.

Please also refer to IT sheets entitled:
- Hazardous Material Handling
- Compressed Gases

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910.110 (LPG); 29 CFR 1920.253 (Oxygen-Fuel cutting); 29 CFR 1910.146 (Confined Spaces); 29 CFR 1910.103 (Hydrogen); 29 CFR 1910.252 (Cutting and welding); 29 CFR 1910.178 (Powered Industrial Trucks); 29 CFR 1910.1000 (Toxic Materials); Subpart L (Fire Protection); Subpart H (Hazardous Materials) 29 CFR 1926.55 (Gases, vapors fumes, dusts and mists); 29 CFR 1926.350 (Gas cutting and welding); 29 CFR 1926.153 (LPG Storage)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CAC Title 24, Part 9, California Fire Code Article 80 (hazardous materials)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The standards are listed substantive OSHA and national consensus standards relating to the use of flammable gases. The OSHA regulations are generally quite vague and do not provide a standard basis for a safety program. However, when augmented by specific CBC and CFC code references, a complete program can be developed. At present, LBNL has a flammable gas control program that is based on these standards, and has a very good record record of handling these materials in a safe, environmentally sound fashion.

15. **Provide assumptions for implementation of standard(s).**

The scale of use is limited to laboratory and maintenance activities. Additional requirements would be applicable if work at the level of a pilot plant were conducted.

NFPA 45 -- chemical labs
NFPA 50A, 50B -- hydrogen
NFPA 51--cutting and welding
NFPA 54 (National Fuel Gas Code)
NFPA 58--LPG.
ANSI B57.1 (valves)
ANSI/UL 407 (manifolds)
CFC 82--LPG.

Compressed Gas Association B57.1 (Valves)
Compressed Gas Association 407 (manifold)

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☒ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Floodplains and Wetlands **Issue ID** 73

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

Clean Water Act, 33 U.S.C. 1344 (Sections 301,401,404 and 506)
10 CFR 1022, Compliance with Floodplain/Wetlands Environmental Review Requirements
33 CFR 320-323, 330 and 352 Corps of Engineers Regulations for Protection of Waters of the U.S. and Nationwide Permit Program
California Fish & Game Code, Sections 1601-1607

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Federal and state agencies must consider the effects of their projects on floodplains and wetlands. Activities on-site could affect wetlands in certain areas; activities off-site potentially could affect both floodplains and wetlands. DOE may require applicants for DOE financial assistance or other entitlements to submit a report on a proposed floodplain/wetlands action. The Berkeley Lab provides assistance to DOE to comply with Executive Orders; however, these were not selected since no formal agreement exists.

15. **Provide assumptions for implementation of standard(s).**

The Berkeley Lab will continue to implement the regulations for both on- and off-site work and provide assistance to DOE to comply with Executive Orders:
Executive Order 11988, Floodplain Management
Executive Order 11990, Protection of Wetlands

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Jack Salazar

Food Sanitation **Issue ID** 74

This issue relates solely to the hygienic practices and necessary considerations to prevent the transmission of disease associated with the safe handling of food and equipment in food service and preparation areas. The scope does not address safe drinking water or sanitary sewer considerations (please refer to ITD "Other Personal Hazards - Drinking Water" for details on the former reference). The operation of the on-site cafeteria (B.54) and related operations (catering) are covered under this issue.

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

CCR, Title 22, Part 7 (Retail Food Facilities), Chapter 4 (Retail Food Practices - California Uniform Retail Food Facilities Law [CURFFL])

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The legal requirement referenced, while a State mandate, provides comprehensive and adequate coverage for the standard food facility operation in place at the Berkeley Lab. The Retail Food Facilities Practices in Title 22 form a basis or framework that can be built upon to increase specificity and level of requirements by local juridictions. In essence, an interested city or county entity can work within the provisions of Title 22, Chapter 4 to develop necessary stipulations, and apply as appropriate. In consideration of this flexibility afforded local agencies, as well as their role in the enforcement of these requirements, it is seen that the requirements noted are now and will be sufficient in the future to address any changes to the food facilities in operation at the Berkeley Lab.

15. **Provide assumptions for implementation of standard(s).**

The requirements are currently implemented at the State level for pertinent Berkeley Lab operations through an informal arrangement for inspections and consultation with food facility staff by the UC Berkeley EH&S Office Registered Environmental Health Specialist (REHS). This service is provided by the UCB REHS on a semi-annual basis, and records of on-site activities are available for review by Berkeley Lab EH&S personnel. All interpretations of CURFFL requirements are consistent with those used to govern similar UCB food facility operations.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Jack Bartley; Philip Williams

General Issues - SRC **Issue ID** 77

Below are the comments and questions that were raised by the SRC members:

General Issues:

* Why didn't all non-legal standards get classified as optional?
The N&S consensus was to include standards that protected the environment, the public or the workers. It is felt the integrity of the set depends on this approach. Examples given included the area of biohazards where no standards exist, so it was decided to use the CDC and NIH guidelines as our standards. A similar approach was taken in electrical safety. The set won't change the standards by which the Lab operates, it will just remove the internal interpretations that have become the bulk of the problems for the scientific work at the Lab.

* There were several comments on inconsistencies of incorporating chapters of Pub3000 into the set.
The group discussed this and came to agreement that the particular Pub3000 chapters referenced for Worker Protection should be removed from the set.

ACTION: Lab Safety Team: Consider Adjusting the Worker Protection Standards accordingly.

* What is to be done about the Conduct of Ops, Accelerator Safety Order and other ES&H management orders?
A team is being formed to separate into two groups: those orders and parts of orders that deal with safety and those that deal with management issues. The safety orders will be deleted unless they have been selected by the N&S process. The management orders will be in as a separate category of the set with a note that they are to be removed or retained as appropriate upon approval of the Integrated Safety Management Plan which will be developed in the

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☒ CG ☐ PC ☒ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Hazardous and Non-Radioactive Portion of Mixed Waste **Issue ID** 79

Includes issues identified by work and hazard analysis:
DTSC Permitted Hazardous Waste
Sattelite Accumulation Area
Waste Accumulation Area

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6901 et seq. ;
Federal Facility Compliance Act (FFCA)
40CFR Sections 260-279, Hazardous Waste; 761.1, PCBs;
29 CFR 1910.120, Training;
29 CFR 1910. 1001, Asbestos Hazardous Waste Control Law;
California Health & Safety Code, Section 25100 et seq.
22CCR Section 66260.1 et seq. - and all permits pursuant;
FFCA Order for LBNL HWCA #95/96-016 (Site Treatment Plan for Mixed Waste);
Berkeley Municipal Code, Chapter 11.52, Hazardous Materials Management as applied to generator areas
Disposal Site Waste Acceptance Criteria

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The federal and state laws and regulations selected provide a comprehensive set of requirements for the management of hazardous waste at Berkeley Laboratory's Satellite Accumulation Areas, Waste Accumulation Areas, Waste Handling Facility and Fixed Treatment Units. In addition, through the adoption of disposal site waste acceptance criteria, legal requirements for waste shipments to sites out of California are adopted.

15. **Provide assumptions for implementation of standard(s).**

Compliance activities will continue to meet the necessary legal requirements. In addition, DOE EM-30 Specific Initiatives (e.g. budget requests, project baselines, cost savings plans, multi-year work plans, etc.) will continue to be supported at the present level. Implementation of hazardous waste laws and regulations at the bench continue to be a challenge and more effective solution need to be sought.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Hazardous and Non-Radioactive Portion of Mixed Waste **Issue ID** 80

*Moderate
Include disposal Site Waste Acceptance Criteria in this.

Added to the set. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rob Connelly

Hazardous Material Handling **Issue ID** 81

This issue addresses the generic health and safety considerations for handling hazardous chemicals in laboratories, facilities operations, and construction activities at the Berkeley Lab. The scope is inclusive of the following sub topics which are found in separate Identification Team Documents: Asbestos (Worker and Environmental Protection), Carcinogens, Confined Spaces (other personal hazards), Compressed Gases, Corrosives, Cryogens, Flammable Gases, Flammable Liquids, Health Hazard Gases, Highly Toxic Materials, Lead Exposure (other personal hazards), Oxidizers, Peroxidizable Chemicals, Pesticide Application and use (other personal hazard), Pyrophoric (gas, solid, or liquid), Reactive or Explosive, Reproductive toxins, and Toxic Materials.

Refer to the following Identification Team Documents for related issues:
Infectious Agents (Bloodborne Pathogens, Animal Handling, Human Use), Emergency Preparedness, Facilities Design (Building and Facilities Safety), Fire Protection (Life Safety), Local Exhaust Ventilation, Ventilation (Workplace), Hazardous Materials Packaging and Transportation (On & Off Site), Hazardous and Mixed Waste, and Hazardous Materials Inventory & Transport.

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910.132 - 138 (Personal Protective Equipment)
29 CFR 1910.1000 (OSHA Permissible Exposure Limits)
29 CFR 1910.1200 (Hazard Communication Standard)
29 CFR 1910.1001 - 1050 (OSHA Expanded Containment Standards; ie., lead, arsenic, cadmium)
29 CFR 1910.1450 (Occupational Exposure to Hazardous Chemicals in Laboratories)

29 CFR 1926 Subpart D (Occupational Health and Environmental Controls)
Subpart E (Personal Protective and Life Saving Equipment)
Subpart Z (Toxic and Hazardous Substances)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CAC Title 24, Part 9, California Fire Code Article 80 (hazardous materials)
American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) for Chemical Substances

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The OSHA Standard (29CFR1910) prescribes requirements for health and safety in the general industry. Specifically, 1910.1000 lists exposure limits for airborne contaminants (PELs). More comprehensive Standards

such as 1910.1450 (Lab Std.) addresses work practices, controls, and training in a laboratory environment, and 1910.1000 (Haz Com) addresses the issue of evaluating potential hazards chemicals and communicating the information to workers.

The OSHA Standard (29CFR1926) prescribes requirements for health and safety in the construction industry.

The CFC prescribes general requirements for storage, handling, and containment of hazardous materials.

The ACGIH TLVs for chemical substances are chosen to supplement the OSHA PELs because: 1) The TLVs are routinely updated and the PELs have not been updated in many years, and 2) the TLVs cover roughly one-third more chemicals than the TLVs. Berkeley Lab will use the TLVs to assist in determining when additional employee protection is needed. ACGIH states that the TLVs are "...recommendations or guidelines... to be interpreted and

15. Provide assumptions for implementation of standard(s).

In concert with the legal requirements, the consensus standards and guidelines noted below provide an adequate guidelines for controlling chemical hazards in foreseeable situations at Berkeley Lab. Examples include:

- ANSI Z87.1 Eye Protection
- ANSI 358.1-1990 - Emergency Eye Wash and Safety Showers
- NFPA 45 - Fire Protection for Labs using Chemicals
- NFPA 49 - Hazardous Chemicals Data
- NFPA 325 - Fire Hazard Properties of Flammable, Liquids, Gases, and Volatile Solids
- NFPA 704 - Recommended System for the Identification of Fire Hazards of Materials
- American Conference of Governmental Industrial Hygienists (ACGIH) Biological Exposure Indices (BEIs)
- National Institute of Occupational Safety and Health Recommended Exposure Limits (RELs) and Immediately Dangerous to Life and Health (IDLH) limits
- American Industrial Hygiene Association (AIHA) Workplace Environmental Exposure Level Guides (WEELs) and Emergency Response Planning Guides (ERPGs)

The following Berkeley Lab documents provide additional implementation details: 1) PUB-5341, Chemical Hygiene and Safety Plan, covers comprehensive chemical storage, use, and control guidelines; 2) PUB-3000, Chapter 19 describes requirement for personal protective equipment; and 3) the Respiratory Protection Plan (LBID-2136) describes the issuance, fitting, and maintenance of respirators.

All of these recommended limits, guides, and standards are important and will be applied by professionals to provide appropriate and complete protection. For example, NIOSH RELs are "recommended" limits, and AIHA WEELs are "guides." ANSI and NFPA standards also sometimes need interpretation and/or comparison to other standards to determine the controls to be implemented.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Blodgett; Philip Williams

Hazardous Material Handling - Krenn **Issue ID** 82

Date: 9/4/96 11:06 AM
Requirement: "Haz" waste disposal of "consumer" chemicals
How is work hindered: Extra time packaging and documenting
Suggested alternatives: Clarification of true dangers to environment of laboratory scale waste.
Additional comments: What seems bizarre is that things like ethanol, methanol, and dilute HCl are required to be dealt with as hazardous waste, when common sense tells us that properly flushed with water, these chemicals are identical to the beer or soup we dump down the sink at home.
The real question is what wastes cause cumulative damage to the environment (some metal ions? certainly not sodium) and which are only true dangers on an industrial scale (a 55 gal. drum of concentrated HCl)

Probably allowing even a little bit of flexibility will open the doors for a great deal of abuse, but perhaps on a case by case basis, some waste streams could be redirected to the municipal stream, depending on how flexible the city and state authorities are.
Requestor: Chris Krenn
Telephone Number: 6035
E-mail: crkrenn@lbl.gov
****
Response:
Paul: Can you figure out a response to this one? PGWilliams. 10/16/96.

Implementation issue. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ OG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Johnson

Hazardous Material Transportation - Offsite **Issue ID** 83

Facilities Issues - Bad road conditions, fire & explosion, loading and unloading, packaging hazardous materials, prolonged periods of driving, transportation of radioactive materials, transportation of other materials, transporting hazardous materials.

IFA Issues - none
Related issues:
Lab ID Team :Transportation of Radioactive Materials

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

49 CFR 106-110 Hazardous Material Transportation
49 CFR 170-180 Hazardous Materials Regulations
49 CFR 397 (Route Designations)
Vehicle Code - State of California and implementing CCR sections to the extent not preempted by DOE requirements
City of Berkeley requirements prohibiting transportation on specified streets at which purge chamber openings are located

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The identified standard in section 5 establishes a comprehensive set of requirements that provide sufficient safety & health protection for the recognized hazard, while meeting legal requirements.

15. **Provide assumptions for implementation of standard(s).**

The LBNL EH&S program follows the identified standard. No additional implementation activities are required.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Johnson

Hazardous Material Transportation - Onsite **Issue ID** 84

Facilities Issue - bad road conditions, fire & explosion, loading & unloading, packaging hazardous materials, prolonged periods of driving, transportation of radioactive materials, transportation of other material

IFA Issue - None
Related issues:
Lab ID Team :Transportation of Radioactive Materials

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ◉ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ◉ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ◉ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ◉ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

LBNL Health & Safety Manual (PUB 3000, Chapter 5, Part VIII, Section 13)

14. **Provide basis for selected standard(s).**

The identified standard in section 13 establishes a comprehensive set of requirements that provide sufficient safety & health protection for the recognized hazard.

15. **Provide assumptions for implementation of standard(s).**

The LBNL EH &S program follows the identified standard. No additional implementation activities are required.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. Issue (s) Resp. Person

Hazardous Materials Inventory — Issue ID 85

2. Issue Origin ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. Is there a legal requirement (s) which applies to this issue? ○ Yes ◉ No

If no, continue; otherwise skip to 5.

4. Is a standard necessary to ensure adequate protection? ○ Yes ◉ No

If yes, skip to 9; otherwise skip to 14.

5. Necessary legal requirement (s)

6. Were any non-value aspects of the legal requirements identified? ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. Description of non-value added aspects of the legal requirement (s).

8. Is the legal requirement (s) sufficient? ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. Is there a non-required external standard(s) which addresses this issue? ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. External necessary standard(s)

11. Are the previously identified standard(s) sufficient? ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. Are the relevant internal standard(s) sufficient? ○ Yes ○ No

13. Describe internal standard(s) or describe new standard(s) to be developed.

14. Provide basis for selected standard(s).

A hazardous materials inventory is legally required by the emergency Planning and Community Right-to-Know Act (EPCRA) for facilities in SIC numbers 20-39. Since the primary SIC number for the Lab is 8733, the preparation of a hazardous materials inventory was determined to not be a legal requirement. However, the Berkeley Lab assists DOE to comply with an Executive Order (No. 12856) that requires DOE to comply with EPCRA. Compliance with state and local EPCRA-related standards were also not selected; however, these requirements will be considered during the implementation phase.

15. Provide assumptions for implementation of standard(s).

The Lab will continue to voluntarily assist DOE to comply with the federal EPCRA and voluntarily comply with state and local (to the extent that the reporting thresholds are identical to the state levels) requirements related to EPCRA.

Emergency Planning and Community Right - to - Know Act (EPCRA), 42 U.S.C. Sections 11021, 11022, 11023
Implementing regulations, per EO 12856 requiring DOE compliance
Health and Safety Code Sections Div. 20, Ch. 6.95, Art. 1, and OES regulations at Title CCR
COB Municipal Code Section 11.52, to the extent inventory thresholds are identical to those specified by OES regulation (within the City of Berkeley portion of Berkeley Lab)
Oakland Municipal Code Article 12, Chapter 2 adopting H&S Div. 20, Chapter 6.95, Art. 1 (within the City of Oakland portion of Berkeley Lab)
Consideration should be given to establishing site thresholds with respect to the inventory- Also, a charge-back service for performing the inventory should be considered.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Hazardous Materials Inventory **Issue ID** 86

Minor
Needs to be put into implementation along with voluntary compliance items.

Moved to implementation. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ron Pauer

Hazardous Materials Inventory - SRC **Issue ID** 87

* Why is EPCRA in the Hazardous Materials Inventory?
The Lab voluntarily assists DOE to follow EPCRA, a federal requirement, and related state and local requirements for which we provide an inventory to the city of Berkeley to provide good community reporting. Federal state and local standards are not referenced as required standards, but will be referenced in the implementation phase.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ CG ☐ PC ☒ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ron Pauer; Philip Williams; Robin Wendt; Nancy

Hazardous Waste Management - Linard **Issue ID** 88

Date: 9/3/96 8:46 AM
From: Tony Linard
Forwarded FYI -
(Cynthia, Ben - these are the comments of a senior researcher in Life Sciences, and reflect general sentiment. A number of investigators in this division have commented that the greatest benefits to be hoped for from Necessary & Sufficient are likely to reside in the area of hazardous waste management.)

Date: 8/31/96 12:38 PM
From: Judith Campisi
Dear Stacey and other LSD members in 70A:

I'm sorry I will be in Bethesda Fri am. However, I have already heard complaints about how cumbersome things are with rad regulations, and waste disposal in general. I urge those of you who are unhappy with new and/or current procedures to be vocal about it -- but more importantly to suggest rational alternatives.

Someone in my lab suggested that EH&S personnel be required to really understand what is involved in doing a "typical" metabolic labeling, sequencing, gel shift, etc experiment. That is, they be required to go through an entire experiment with one or more researcher. The training EH&S requires of us is lengthy, redundant, and impractical. In addition, we are continually having to explain the practicalities of doing experiments. This is irritating to say the least, and simply adds to the increasing burden of trying to comply with regulations.

My dealings with EH&S in this bldg have been nothing but cordial and very often helpful. However, the people we deal with on a day to day basis are bound by what appears to be an increasingly remote bureacracy. It is frustrating, time-wasting and outrageous how frequently rules change, and I wonder whether EH&S is really being vigilant in questioning, and if necessary challenging, regulations that appear to be cumbersome or frivilous. A classic example is when orange biohazard bags were no longer permitted because RED ones were mandated! This was utterly stupid! And a waste of taxpayer's money! Who accepted this mandate, and why??

Finally, I want to share with you the experience I have had time and again at LBL. Someone says you need to do thus and so because it is a DOE, or Berkeley City, or God-on-High rule. ASK TO SEE THE RULE IN WRITING!!! In many cases, it turns out there is no such rule.! It is simply someone's INTERPRETATION of what the rule says -- OR WORSE WHAT WE SHOULD DO TO MAKE SOME BUREAUCRAT'S JOB EASIER! Don't be shy about politely but firmly demanding to see where something is mandated. There most certainly are many procedures that are mandated. But you would be surprised at how many are not -- they are merely interpretations, sometimes made by well-meaning bureaucrats, but sometimes made by ignorant or lazy ones. Tony Linard has been superb at trying to tease out real requirements from fantasized ones, but he needs our input and support.

I'm sorry I will miss the Friday meeting, but I'm confident there are many of you who can convey our frustration to EH&S -- and challenge them not only to be prudent in passing regulations down to us, but to stand up and fight against irrational and impractical regulations. It would be great if we could work together to stem this flood of costly and stifling rules.

Judy Campisi

Standards will allow more efficient implementation. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☒ E ☒ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Blodgett

Health Hazard Gas **Issue ID** 89

A health hazard gas is defined as a gas that may cause significant acute or chronic health effects in people at low concentrations. The gas can poison some one and/or cause corrosion, irritation, and disease in human tissue. The scope of application of this issue is limited to storage, use, and control of health hazard gases. Examples of health hazard gases stored or in use at the Berkeley Lab are: ammonia, boron trifluoride, carbon monoxide, fluorine, hydrogen chloride, nitric oxide, nitrogen dioxide, sulfur dioxide, etc. The complete list of these gases is contained in the Berkeley Lab Health and Safety Manual (PUB-3000, Chapter 13, Appendix B).

Also see the following IT sheets for related issues/standards:
Lab ID Team - Compressed gases; Accelerator ID Team - Hazardous Materials Handling

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

OSHA 29 CFR 1910.1000, Air Contaminants, Permissible Exposure Limits (PEL's).

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CAC Title 24, Part 9, California Fire Code Article 80 (Hazardous Materials)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The OSHA Standard (29CFR1910) prescribes requirements for health and safety in the workplace. Specifically, 1910.1000 lists exposure limits for airborne contaminants while more comprehensive Standards such as 1910.1450 (lab Std.) addresses work practices, controls, and training in a laboratory environment (as referenced from the Hazardous Materials Handling ITD sheet).

The CFC prescribes requirements for storage, handling, and containment of hazardous gases.

15. **Provide assumptions for implementation of standard(s).**

National Consensus standards and guidelines, in collaboration with stated legal requirements, are accepted as best management practice for working safely with Health Hazard Gases. This framework has been noted as very successful in allowing work to proceed safely at similar R & D institutions. The Berkeley Lab use of health hazard gases is largely confined to small quantity research applications. PUB -3000 Chapter 13 describes in detail Berkeley Lab requirements governing use of health hazard gases and is based upon the above listed standards and best management practices. PUB 5341, Chemical Hygiene and Safety Plan (CHSP) covers comprehensive chemical storage, use, and control guidelines. Examples of the consensus standards are included on the Hazardous Material Handling Sheet.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Blodgett; Bruce King

Health Hazard Gas - SRC **Issue ID** 90

* Should Pub3000 be included under Health Hazard Gas as a means of providing a definition of it?
It is possible Health Hazard Gas is covered in other areas and is duplicative, so this category needs to be checked.

ACTION: Lab Safety Team to check if the coverage of Health Hazard Gas is duplicated in the Set.

****

Response:
The Lab. Safety Team considered this issue. It was decided that this category required addressing separately to general chemical hazards, and other specific chemical hazards. The issue form was retained. PGWilliams. 10/16/96.

PUB3000 was moved to implementation. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☒ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Jack Salazar

Heat/Cold Stress **Issue ID** 92

This issue relates to the considerations appropriate to prtect workers from the effects of exposure to extreme temperature conditions. Cold stress references are intended to protect all parts of the body with particular emphasis on the hands, feet, and head. Heat stress considerations are intended to monitor and maintain conditions under which nearly all workers may be exposed without exhibiting adverse health effects.

Example of potential exposure scenarios related to this issue include off-site research activities conducted in remote, climatically-harsh environments (e.g., drilling in the San Joaquin Valley or California desert areas (heat primarily) or other geologic investigation activities conducted under the auspices of the Earth Sciences Division, as well as other similar field research endeavors affliated with other divisions). In addition, prolonged exposure to cold rooms/freezers associated with Biosciences reaserch can also be of relevance.

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ◉ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ◉ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

The ACGIH Threshold Limit Values for Heat & Cold Stress (1995-1996 edition of Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indicies).

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The selected standards from the ACGIH are uniqely discrete, widely recognized, and stand alone in the absence of other standards/requirements on the subject(s) that they would provide an adequate framework for addressing heat/cold stress concerns affliated with Berkeley Lab operations. The types of potential exposures, especially those related to field activities noted previously, that are the most likely exposures to heat/cold for Berkeley Lab employees match very well with the referenced standard(s).

Berkeley Lab will use the TLV to assist in determining when additional employee protection is needed. ACGIH states that the TLVs are "...recommendations or guidelines... to be interpreted and applied only by a person trained in this discipline..." (i.e., industrial hygiene), and the ACGIH "...does not advocate..." the use of TLVs "...as legal standards."

15. **Provide assumptions for implementation of standard(s).**

Off-site work involving Berkeley Lab employees, with the exception of those activities occuring under the auspices of another facility with a viable ES&H program (e.g., Yucca Mountain Project), will be governed by LBNL requirements. It should be noted that the heat stress provisions in the ACGIH guidelines for heat stress assume workers are "acclimitized, fully clothed (lightweight pants and shirt), with adeqate water and salt intake." Requirements or considerations for workers operating under other conditions will be adjusted accordingly.

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☒ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Blodgett

Highly Toxic Materials **Issue ID** 99

A highly toxic chemical is defined as a substance that has evidence of acute or chronic health hazard as listed in the NIOSH Registry of Toxic Effects of Chemical Substances (RTECS), and has a median lethal dose (LD_{50}) of less than 500 mg/kg of body weight when administered orally to rats. The scope of the application of this topic is limited to storage, use, and control of highly toxic solid and liquid chemicals. Some examples of highly toxic chemicals stored or in use at the Berkeley Lab are: acrylamide, cadmium chloride, ethidium bromide, guanidine hydrochloride, hydrazine, β-mercaptoethanol, phenylmethylsulfonylfluoride, sodium azide, sodium hydroxide, etc.

Also see the following ITD sheets for related issues/standards:
Lab ID Team - Carcinogens, Reproductive Toxins, Toxic Material
Accelerator ID Team - Hazardous Materials Handling

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

OSHA 29CFR1910.1000, Air Contaminants, Permissible Exposure Limits (PEL's)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CAC Title 24, Part 9, California Fire Code Article 80 (Hazardous Materials)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The OSHA Standard (29CFR1910) prescribes requirements for health and safety in the workplace. Specifically, 1910.1000 lists exposure limits for airborne contaminants while more comprehensive Standards such as 1910.1450 (lab Std.) addresses work practices, controls, and training in a laboratory environment (as referenced from the Hazardous Materials Handling ITD sheet).

The CFC prescribes general requirements for storage, handling, and containment of highly toxic chemicals.

15. **Provide assumptions for implementation of standard(s).**

The combination of legal requirements and recognized consensus standards form adequate and appropriate safety envelope for Berkeley Lab use of highly toxic materials. This framework has been noted as very successful in allowing work to proceed safely at similar R & D institutions. The Berkeley Lab use of highly toxic chemicals is limited to small-scale research applications involving relatively small quantities of highly toxics. PUB-5341, Chemical Hygiene and Safety Plan (CHSP) covers comprehensive chemical storage, use, and control guidelines. Additionally, the use of highly toxic materials does not exceed the threshold that would invoke Process Safety Management (29CFR1910.119) or Risk Management Program provisions. Examples of the consensus standards

are included on the Hazardous Material Handling Sheet.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Human Subjects **Issue ID** 100

*Moderate
No change

****

Response:
Does anyone recall why this issue was raised? PGWilliams. 10/16/96.

Clarification to ensure it was covered, handled orally. Ben 11/8/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Chris Donahue; Roger Kloepping; Edwin Njoku; Mike

Laboratory Airborne Radioactivity Monitoring **Issue ID** 105

Requirements for monitoring of workplace air to assure compliance with 10 CFR 835 requirements, especially with regard to radiation dose limits for occupational workers. Specifies conditions requiring air monitoring and general types of monitoring (sampling and real-time)

Related issues: Lab ID Team : Radiological Protection Program ; Radiation Dose Limits and Dose Assessment; Accelerator ID Team: On site exposure .

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

10CFR835.403 "Area Monitoring"

6. **Were any non-value aspects of the legal requirements identified?** ◉ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

Requirement for real-time air monitoring when levels exceed 1 DAC is excessive. Requirement must be tied to potential exposure.

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

10 CFR 835 is a legal requirement.
10 CFR835 specifies a 1 DAC action level for real-time air monitoring . This requirement is excessive and expensive for short-duration exposures that would not result in significant exposures.

15. **Provide assumptions for implementation of standard(s).**

Implement the requirements of 10CFR835 similar to the implementation of 10 CFR 20 in industry. The detailed RPP based on the selected standards will address the hazards to this particular site and will contain enforceable controls that comply with the regulation, but are tailored to site hazards. In this case, monitoring requirements based on potential radiation dose will be developed, and placed in the RPP and Pub 3000. The requirement for real-time monitoring will be tied to a potential risk of exceeding 10 % ALI.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☒ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Dean Decker; Ken Barat

Laser Systems **Issue ID** 106

This issue should address all lasers used at LBNL, which are predominantly of the desktop, research variety. Laser use goes from lasers as tools (e.g., laser scanning confocal microscope and alignment lasers) to laser development (e.g., femtosecond lasers to generate femtosecond x-rays).

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910, "Occupational Safety & Health" (various sections)
29 CFR 1926, "Safety & Health for Construction" (various sections)

6. **Were any non-value aspects of the legal requirements identified?** ◉ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

29CFR 1910
29 CFR 1910.132 & .133, and 29 CFR 1926.95 & .102 (Eye and Face Protection)

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

ANSI Z136.1 - 1993: American National Standard for the Safe Use of Lasers, except section 3.4.1.
ANSI Z136.2: American National Standard for the Safe Use of Optical Fiber Communication Systems utilizing Laser Diode and LED Sources

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The selected external standards are more specific to the hazards present at LBNL, an R&D environment.

ANSI standard is nationally recognized as the leading standard. Certain sections, as noted in #13, apply to the industrial setting and not the laboratory setting, and should be modified accordingly. In particular "3.4.1 Nomical Hazard Zones." In a research environment, it is better to consider the room the hazard zone than do a distance calculation. Our thrust is on Beam Control, not at what distance does the beam stop becoming a hazard.

15. **Provide assumptions for implementation of standard(s).**

Addition implementation guidance on this issue can be found in:
-NFPA 115 Laser Fire Protection
-LBNL PUB-3000, Chapter 16, Lasers (currently in revision)

Correct implementation will require that the local Laser Safety Officer (LSO) has the decision authority as outlined in ANSI Z136.1. Current LBL policy mitigates and dilutes the authority, though the PUB-3000 Chapter revision recognizes the LSO authority in making decisions on safety issues realting to laser installations.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Dean Decker

Laser Systems - SRC **Issue ID** 108

* Do the Laser Safety Chapter of Pub3000 and NFPA 115 Laser Fire Protection need to be in the set under Laser Systems?
Both documents should be considered to go under implementation.

ACTION: Lab Safety Team to consider revising Issue Forms

****

Response:
Both these documents were moved to the implementation section, as advised. PGWilliams. 10/16/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ OG ☐ PC ☒ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Davis

Lead Exposure **Issue ID** 109

IFA Issue - none

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910.1025 & .1450 OSHA General Industry Standards

29 CFR 1926.62 OSHA Construction Industry Standards

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Standards identified in Section 5 estabish a comprehensive set of requirements that provide adequate safety and health protection for lead hazards, while meeting legal requirements.

15. **Provide assumptions for implementation of standard(s).**

The current LBNL Lead Compliance Program already follows these identified standards. No additional implementation or actions are required.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Bert Schleifer

Liability for contract employees **Issue ID** 110

From: Cynthia Tilden (9/27/96)

Subject: Issue for N&S ID Team Action

We received the below issue/comment from the Confirmation Team on the draft standards set.
ISSUE: Address liability for contract employees

Comment: Contract employees fall into two groups. Those that under the direct supervision of Berkeley Lab and those that are under the supervision of a subcontractor.

Contract employees that are under the direct supervision of Berkeley Lab are protected by the same worker protection standards asBerkeley Lab carreer employees. The applicable standards include all Occupational Safety standards identified in the Berkely Lab standards list.

Contract employees that are under the supervision of a subcontractor (s) are typically employed on construction subcontracts. In this case the subcontractors safety plan is the governing document . The safety plan must, at a minimum, meet the Berkeley Lab subcontract specification requirements for Construction Safety . The applicable standards are defined under Construction Safety in the Berkely Lab standards list.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Davis

Lighting (Illumination) of Work Areas **Issue ID** 112

Facilities Issue: Adequate Illumination of Work Area

Note: General facilites lighting requirements such as normal facilities lighting and exit lighting are identified under a separate N&S document "Building and Facilities Safety-Facilities Design"

IFA Issue - None

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910 OSHA General Industry Standards

29 CFR 1926.26 & .56 OSHA Construction Industry Standards

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The standards identified in section 5 provide a comprehensive set of requirements that provide adequate safety protection for recognized illumination issues, while meeting legal requirements.

15. **Provide assumptions for implementation of standard(s).**

Current LBNL policy follows these identified standards, no additional implementation or actions are required. The document listed below is used to aid in the implementation of these standards.

Chapter 11 "Illuminance Values" IES Lighting Handbook - 8th edition (1993)
(Illuminating Engineering Society)

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rich Haddock

Linear Motion - Tensile Tester **Issue ID** 117

Tensile testers subject material samples to tension, often until the sample fails. Test specimens may be of metal or plastic, solid or stranded or braided, etc. When the sample fails, there is the possibility of flying materials, such as spalling fragments or whipping strands of wire rope. Depending on the size of the tester, barriers need to be provided to caontain the test specimen, or at least safety glasses need to be worn. Tensile testers often contain mechanical and hydraulic components which need to meet pressure safety or machine guarding requirements.

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

29 CFR 1910 addresses electrical, PPE, and machine guarding.

15. **Provide assumptions for implementation of standard(s).**

Incorporate R&D, not pilot/production lab, safety control and considerations associated with this issue into PUB-3000.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Blodgett

Local Exhaust Ventilation (Includes HEPA Filtration Systems) **Issue ID** 118

Local exhaust ventilation systems operate on the principle of capturing a contaminant at or near its source. The scope of the application of this issue is limited to design and performance testing of fume hoods, glove boxes, biological safety cabinets, grinding hoods, cone hoods, plating tanks, vapor degreasers, and design and performance testing of High Efficiency Particulate Air (HEPA) Filtration Systems.

HEPA Filtration Systems are associated with local exhausts systems and equipment. The purpose of these systems is to filter-out particles (e.g., radionuclides, asbestos, lead, biological organisms, etc.) with a 99.97% efficiency. The scope of the application of this issue is limited to design and performance testing of HEPA filter systems for fume hoods and glove boxes (bag in-bag out and sealed filter boxes), biological safety cabinets, HEPA vacuum cleaners, and negative air machines.

Also see the Following ITD sheets for related regulations/issues:
Facilities ID Team - Facilities Design (Building and Facilities Safety)

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

OSHA 29CFR, Sections:
1910.94, Ventilation
1910.107, Spray finishing using flammable or combustible liquids
1910.108, Dip tanks containing flammable or combustible liquids
1910.1030, Bloodborne Pathogens
1926.57, Ventilation
1926.353, Ventilation and protection in welding, cutting, and heating

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The OSHA Standards (29CFR1910 and 1926) prescribe requirements for local exhaust ventilation controls for the general industry and construction industry, respectively. Specifically, 1910.94 lists required exhaust flow rates and capture velocities for equipment, tanks, and spray booths and 1910.1030 addresses the need for biological safety cabinet certification. 1926.57 (construction industry) mirrors 1910.94 above, and 1926.353 requires ventilation for welding, cutting, and heating operations where there are associated toxic metals (lead, cadmium, beryllium, etc.) or enclosed spaces.

15. **Provide assumptions for implementation of standard(s).**

The combination of legal requirements, recognized consensus standards, and guidelines form adequate and appropriate ventilation controls for Berkeley Lab operations where local exhaust systems are needed to prevent

exposure to or release of chemicals, gases, biological organisms, or radiation. Examples include:

ANSI Z9.5 Laboratory Ventilation
ANSI Z33.1 Design and Operation of Local Exhaust Systems
ANSI N510 -- Testing of Nuclear Air Cleaning Systems
ANSI N509 -- Nuclear Air Cleaning Components
National Sanitation Foundation (NSF) 49 - Class II Biohazard Cabinetry
Guidelines for Glove Boxes - American Glove Box Society
American Conference of Governmental Industrial Hygienists (ACGIH), Industrial Ventilation, A Manual of Recommended Practice

This framework has been noted as very successful in allowing work to proceed safely at similar R & D institutions. The Berkeley Lab "Local Exhaust Ventilation Survey Guidelines" are used to measure performance of all local exhaust points (i.e., in shops and labs) and do not consider general building ventilation issues. The ACGIH Ventilation Manual is recognized as the industry standard for assessing the adequacy of numerous ventilation installations/exhaust points. ANSI Z9.5 offers germane guidance on laboratory ventilation criteria.

All new HEPA filter system designs incorporate provisions for efficiency testing of the filter. The Berkeley Lab "HEPA Filtered Vacuum Cleaner Acceptance Test Procedure" is used to test the efficiency of all HEPA vacuums and testable bag-in/bag-out systems. The ANSI national consensus standards (N509 & N510)provide germane coverage of all Berkeley Lab HEPA filter systems. There is an identified need for establishing the criteria of testing existing box HEPA filters in non-testable systems and maintenance schedule for bag-in/out systems.

All Class II biosafety cabinets in which infectious agents are used are certified annually. The National Sanitation Foundation (NSF) standard offers widely accepted and authoritative guidance of the testing procedures and certification criteria associated with biosafety cabinets.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Johnson

Material Handling **Issue ID** 124

Facilities Issues - elevators, falling objects, hazardous tools & machinery.

IFA Issues - Bridge crane, gravity loaded equipment, lifting fixtures, manual hoist, monorail crane, motorized hoist.

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910 General Industry Standards

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The standards identified in section 5 establish a comprehensive set of requirements that provide sufficient safety & health protection for the recognized hazard, while meeting legal requirements.

15. **Provide assumptions for implementation of standard(s).**

The LBNL EH&S program follows the identified standards. No additional implementation activities are required. The ANSI standards, California Safety Orders (CCR Title 8) and the California Labor Code may serve as supplemental guidelines in the implementation of the legal standards.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Material Handling **Issue ID** 125

Minor
No Change

Clarification of issue. Ben 11/6/96

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Steve McConnell

Mechanical Hazards - Aviation **Issue ID** 127

Facilities issue - Aircraft charters
IFA issues - none

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ◉ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ◉ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

DOE 440.2 aviation

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

DOE 440.2 Contains requirements for chartering aircraft.

15. **Provide assumptions for implementation of standard(s).**

The LBNL program already follows the applicable section of the identified standard. No additional implementation activities are needed.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Steve McConnell

Mechanical Hazards - Tools, equipment and pressurized containers. **Issue ID** 128

Facilities issues - special manual and power driven hand tools.

IFA issues - hydraulic equipment - commercial >5000 psi, hydraulic equipment - custom built at any pressure, jacks, cutting equipment - shear, linear motion - brake, linear motion - hydraulic ram, linear motion - power actuated tools, linear motion - power press, rotating equipment - belt driven, rotating equipment - shop equipment, spring loaded equipment, pressure equipment - stored energy greater than 100 KJ, pressure vessels

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910 OSHA General Industry Standards
29 CFR 1926 OSHA Construction Industry Standards

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The identified standards in section 5 establish a comprehensive set of requirements that provide sufficient safety and health protection for the recognized hazard, while meeting legal requirements.

15. **Provide assumptions for implementation of standard(s).**

The appropriate chapters of LBNL Pub 3000 are used to implement the identified standards. No additional implementation activities are needed.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. Issue (s) Resp. Person

Medical Waste

Issue ID 129

2. Issue Origin ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. Is there a legal requirement (s) which applies to this issue? ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. Is a standard necessary to ensure adequate protection? ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. Necessary legal requirement (s)

Resource Conservation and Recovery Act (RCRA), 42 U.S.C.Section 6992 et seq. (Medical Waste Tracking Act of 1988, Subtitle J)
29 CFR 1910.1030, Bloodborne Pathogen Standard
California Health and Safety Code, Sections 25020.5 - 25090.6 (California Medical Waste Management Act)

6. Were any non-value aspects of the legal requirements identified? ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. Description of non-value added aspects of the legal requirement (s).

8. Is the legal requirement (s) sufficient? ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. Is there a non-required external standard(s) which addresses this issue? ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. External necessary standard(s)

11. Are the previously identified standard(s) sufficient? ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. Are the relevant internal standard(s) sufficient? ○ Yes ○ No

13. Describe internal standard(s) or describe new standard(s) to be developed.

14. Provide basis for selected standard(s).

The federal law and regulation and the state law selected provide a comprehensive set of requirements for the management of medical waste. California Department of Health Services is the state implementing agency and its inspectors made references to these standards selected during its previous inspection at the Lab.

15. Provide assumptions for implementation of standard(s).

Berkeley Lab has a fully implemented medical waste management program. In addition, DOE EM-30 Specific Initiatives (e.g. budget requests, project baselines, cost-savings plans, multi-year work plans, etc.) will continue to be supported at the present level. Implementation needs to consider effective solutions for minimizing the volume of "perceived" medical waste - for example, the use of a chipper to effectively alter the appearance of "perceived" medical waste.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rob Connelly

Noise Levels **Issue ID** 135

There are a variety of noise hazards at the Berkeley Lab including but not limited to: occupational exposures from consturction equipment, stationary mechanical equipment, portable power tools used in the field and in shops, mechanical rooms, etc. These hazards are present for LBL employees, contract employees, and subcontractor employees. Noise level related issues would also include noise generated by the Berkeley Lab and heard by the local community. It would not include NC curve criteria for engineering purposes.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910.95 and 1926.52 (The General Industry and Construction Noise Standards - OSHA)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

OSHA Requirements adequately address noise exposure to employees.

15. **Provide assumptions for implementation of standard(s).**

Standards for local community noise levels generated by Berkeley Lab are addressed by the City of Berkeley Noise Ordinance (Chapter 13.40). Berkeley Lab will use this ordinance as guidance to control environmental noise on-site.

The existing federal OSHA regulations for occupational noise exposure in both general and construction industries (i.e., 29 CFR 1910.95 and 29 CFR 1926.52), including requirements for a Hearing Conservation Program, are necessary and sufficient to provide protection to personnel at the Berkeley Lab. These regulations are compared to the American Conference of Governmental Industrial Hygienist (ACGIH) Threshold Limit Value (TLV) Standards for noise exposure in the following statements:

1. The Federal OSHA regulations are accepted and used by employers across the United States. In contrast, the ACGIH states that the TLVs are "...recommendations or guidelines... to be interpreted and applied only by a person trained in this discipline..." (i.e., industrial hygiene). In addition, the ACGIH "...does not advocate... " the use of TLVs "...as legal standards."

2. The Federal OSHA regulations provide integrated requirements for noise exposure limits, implementation of controls when noise exposure limits are exceeded, and maintenance of a hearing conservation program. The ACGIH TLV Standards provide primarily noise exposure limits without integration of control and program requirements. Implementation of OSHA control and program requirements based on measured TLV exposures is difficult and inconsistent.

3. The OSHA regulations provide sufficient protection for the nature of risk at Berkeley Lab (i.e., relatively intermittent and shorter in duration than general industry). In contrast, the more conservative ACGIH TLVs are established to protect against noise-induced hearing loss exceeding 2 dBA after 40 years of continuous

occupational exposure. In addition, both OSHA and ACGIH require application of hearing protection and medical monitoring at the same action level (i.e., 85 dBA). In technical evaluation, the ACGIH action level as measured by sound pressure is only slightly less than the OSHA PEL, due to the ACGIH being a more conservative calculation of average noise exposure.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Nonhazardous Waste - including pollution prevention, conservation & **Issue ID** 138

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

Solid Waste Disposal Act, 42 USC, Section 6901 et. seq.
40 CFR Part 243-256, Federal Agency Recycling Programs
California Integrated Waste Management Act of 1989, California. Public Resources Code, Section 4000 et. seq.
14 CCR, Section 17200 et. seq.
Measure D, Section 64, Alameda County Waste Reduction and Recycling

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Both federal and state laws and regulations selected provide a comprehensive set of requirements for the management of nonhazardous solid waste. In addition, the state and Alameda County regulations cover waste minimization and recycling by requiring a 50% (state) or a 75% (county) diversion of solid nonhazardous waste from landfills by the year 2000.

UC Contract Performance Measure - the Lab goal is a 10% reduction in aggregate wt. each calendar year.

15. **Provide assumptions for implementation of standard(s).**

Berkeley Lab has a fully implemented program and will continue to maintain the current program including providing voluntary assistance to DOE for compliance with Executive Orders:
EO 12780, Recycling, Federal Agency Policy
EO 12873, Federal Acquisition Recycling and Waste Prevention
EO 12902, Energy Efficiency and Water Conservation
EO 12995, Amendments to EO 12873
The federal executive orders cover pollution prevention, closed loop recycling of recovered products, and conservation of water and energy.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Mike Schoonover

Nuclear Materials Management **Issue ID** 140

This issues covers reporting of nuclear materials transactions and inventory via the Nuclear Materials Management and Safeguards System (NMMSS) system, DOE Order 5633 (NMMSS).

This issue should be considered as a necessary management requirement for nuclear material when implementing the RPP.

As a management order concerned with Safeguards and Security, it is not subject to the WSS process and thus remains in the contract. Ben Feinberg 11/9/096

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Davis

Other Personal Hazards - Drinking Water - PC **Issue ID** 142

Comments from OAK ES&H Policy Committee (Black)

Subject: Comments to Draft WSS Issues and Standards
From: steve black
Date: 9/16/96 10:12 AM

3. Under Other Personal Hazards/Drinking Water - No standard has been included for use of backflow prevention devices. Was this intentional? Two possibilities include the Calif. Code of Regs., Title 17, Division 1, Chapter 5, Group 4, "Drinking Water Supplies", and/or the Uniform Plumbing Code, Section 1003, "Cross-Connection Control". Also, in general, there seems to be an inconsistency of including industry standards such as ANSI standards under the various topics. There are several potential ANSI standards that may be applicable to this drinking water section for example (listed below). Again, I don't know who prepared this section, so my comment may need to be forwarded.....Has the "Core Team" discussed the general issue of including these types of standards? I'm sure there are many that could apply to sampling and analysis activities in the evironmental area for example.

Possible drinking water standards (I'm not familiar with any of these, but judging by the titles they look potentially applicable. I got them off the ANSI internet home page.):

- ANSI/ASSE 1003-1995 - Water Pressure Reducing Valves for Domestic Water Supply Systems
- ANSI/NSF 61-1995 - Drinking Water System Components - Health Effects
- ANSI/ARI 1020-84 - Application and Installation of Drinking Fountains and Drinking Water Coolers
- ANSI/UL 399-1992 - Drinking Water Coolers

[Steve Black's other comments were on other issues, and were edited out of this form. Bert Schleifer)

Response from Paul Davis to Bert Schleifer 9/23/96:

Although I am not familar with these ANSI standards (the reviewer wasn't either) I do not think they are necessary in the implementation section because the current LBL Drinking Water Program (which is already cited in the implementation section) already has sections covering these topics.

CCR Title 17 is currently cited as a standard in the LBL Drinking Water Program, and this program is already listed in the implementation section. So in a way CCR Title 17 is already in the implementation section, though it isn't apparent. If you would like I will update the form on Drinking Water and list CCR Title 17 separately in the implementation section. Let me know.
Thanks

The inclusion of the LBL drinking water standards in implementation is sufficient. Ben Feinberg 11/12/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☒ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

9. Is there a non-required external standard(s) which addresses this issue? O Yes O No

If yes, continue; otherwise skip to 12.

10. External necessary standard(s)

11. Are the previously identified standard(s) sufficient? O Yes O No

If no, continue; otherwise skip to 14.

12. Are the relevant internal standard(s) sufficient? O Yes O No

13. Describe internal standard(s) or describe new standard(s) to be developed.

14. Provide basis for selected standard(s).

15. Provide assumptions for implementation of standard(s).

The current LBNL Drinking Water program already follows these identified standards, no additional implementation activities are required. The documents listed below are used to aid in the implementation of these standards.

LBNL Pub 3000, chapter 4

ANSI / AWWA C651-86 Standard for Disinfecting Water Mains
(American Water Works Association)

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rich Haddock

Ovens, Includes Laboratory Furnaces **Issue ID** 143

Included here are ovens, furnaces, and autoclaves. Ovens typically have electric heating elemeents and are used to bake or dry materials placed into them. Ovens may operate under vacuum. Furnaces typically operate at higher temperatures and are used to melt, temper, or ash materials. Autoclaves are typically steam heated and are used to disinfect materials that may be biologically contaminated.
Of concern is that materials in avens of furnaces may generate ignitable vapor/air mixtures through outgassing or decomposition. Materials placed in ovens, etc., must be screened to preclude this. Where such is not precluded, there needs to be adequate ventilation and possibly even explosion venting of the oven.

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ◉ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ◉ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

NFPA 86 Standard for Ovens and Furnaces
CFC Article 62 Industrial Baking and Drying Ovens

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Consensus standards that provide adequate protection for LBNL use of ovens/furnaces.

15. **Provide assumptions for implementation of standard(s).**

CFC 62 is only necessary to the extent that LBNL applications meet the definition of industrial use.

Berkely Lab may address this issue further through revisions in PUB-3000, based on the NFPA standard and on good practice as contained in Factory Mutual guidance on this subject.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☒ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Blodgett

Oxidizers **Issue ID** 144

An oxidizing chemical is defined as a substance that yields oxygen readily to cause or enhance the combustion (oxidation) of organic material. The scope of the application of this topic is limited to storage, use, and control of oxidizing solid and liquid chemicals. Some examples of oxidizers stored or in use at the Berkeley Lab are: nitric acid, hydrogen peroxide, osmium tetroxide, sodium perchlorate, etc.
Also see the following ITD sheets for related issues/standards:
Lab ID Team - Reactive/explosive chemicals
Accelerator ID Team - Hazardous Materials Handling

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

OSHA 29CFR1910.1000, Air Contaminants, Permissible Exposure Limits (PEL's)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CAC Title 24, Part 9, California Fire Code Article 80 (Hazardous Materials)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The OSHA Standard (29CFR1910) prescribes requirements for health and safety in the workplace. Specifically, 1910.1000 lists exposure limits for airborne contaminants while more comprehensive Standards such as 1910.1450 (lab Std.) addresses work practices, controls, and training in a laboratory environment (as referenced from the Hazardous Materials Handling ITD sheet).

The CFC prescribes requirements for storage, handling, and containment of oxidizing chemicals.

15. **Provide assumptions for implementation of standard(s).**

The combination of legal requirements and recognized consensus standards form adequate and appropriate safety envelope for Berkeley Lab use of oxidizers. This framework has been noted as very successful in allowing work to proceed safely at similar R & D institutions. The Berkeley Lab use of oxidizers is limited to small-scale research applications involving relatively small quantities of oxidizers. PUB-5341, Chemical Hygiene and Safety Plan (CHSP) covers comprehensive chemical storage, use, and control guidelines. Examples of the consensus standards are included on the Hazardous Material Handling Sheet.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Ozone Depleting Substances **Issue ID** 145

Includes issue identified by work and hazard analysis:
Equipment Containing Ozone Depleting Substances.

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

42 U.S.C. Section 7671 et seq. (CAA Amendments of 1990)
40 CFR 82, Protection of Stratospheric Ozone, Subparts A-G
Bay Area Air Quality Management District (BAAQMD) Regulation 12, Rule 7, Motor Vehicle Air Conditioner Refrigerant

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The Clean Air Act Amendments of 1990 require the production phase-out of ozone-depleting substances (OSDs). In response Executive Order #12843 was issued requiring federal agencies to minimize purchases and be aware of the phase out schedule. However, this Order was not selected because a formal agreement does not exist between DOE and the Lab. The BAAQMD regulation prescribes requirements for the recovery of freon from motor vehicle air conditioning systems.

15. **Provide assumptions for implementation of standard(s).**

Berkeley Lab will maintain its current program to comply with all legal requirements and will continue to voluntarily assist DOE to comply with the Executive Order: E.O. 12843, Procurement Requirements & Policies for Federal agencies for Ozone-Depleting Substances (maximizes the use of alternatives to OSDs, modifies procurement policies to reduce the use of OSDs earlier than the present deadline)

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

PCB Containing Equipment **Issue ID** 146

Includes issue identified b y work and hazard analysis:
PCB contaiminated equipment

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

Toxic Substances Control Act, 15 U.S.C. 2601-2692
40 CFR 761, Polychlorinated Biphenyls (PCB)
Note: Management of PCB waste is addressed in the hazardous waste standards ID document.

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Standards for the use of PCB equipment, such as capacitors, have been established by the Toxic Substances Control Act. The implementing regulations, found in 40 CFR 761, include requirements specifying disposal methods and marking (labeling) procedures, and controlling PCB use.

15. **Provide assumptions for implementation of standard(s).**

Current PCB program is in full compliance with standards and will be maintained.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rick Kelly

Peroxidizable Chemicals **Issue ID** 148

Peroxidizable chemicals are chemicals, both organic and inorganic, that autooxidise in the presence of air to form potentially explosive peroxides. Examples of peroxidizable chemicals in use at LBNL include 1,4 Dioxane and Isopropanol.

Please see related ITD sheets on:
-Hazardous Material Handling
-Reactives/Explosives
-Hazardous Materials Inventory and Reporting
Please also refer to Environmental ID sheets on:
-Hazardous Material Transportation - On-Site
-Hazardous Material Transportation - Off-Site
-Material Transportation

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ◉ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ◉ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ◉ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ◉ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

LBNL will need to develop an internal standard based on the comprehensive review article, "Safe Handling of Peroxidizable Chemicals: A Critical review of the Literature," by R.J. Kelly, Chemical Health & Safety, Sept./Oct. 1996.

No other known source, standard or reference is available that is as comprehensive and accurate.

14. **Provide basis for selected standard(s).**

There are essentially no codes covering the safe handling of peroxidizable chemicals. The datasheet on peroxidizables is the most complete and accurate piece of information on the subject av ailable as a consensus standard. The article by Kelly is the most accurate and comprehensive review of the subject available, and provides a sound basis for development of an internal standard.

15. **Provide assumptions for implementation of standard(s).**

LBNL uses peroxidizable chemicals in many laboratories and in many ways. Thus, the potential hazard is fairly widespread and at this time not comprehensively controlled. An explosion at UCSF in 1995 involving a peroxidized solvent demonstrates the clear hazard they pose. An internal standard based on the ACS article noted above as well as additional guidance from the National Safety Council Data Sheet 655, Safe Handling of Peroxidizable Chemicals, 1982 will adequately address use considerations associated with peroxizable solvents at LBNL.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☒ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Peroxidizable Chemicals **Issue ID** 149

Minor
No change

Clarification of issue. Ben 11/8/96

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Davis

Pesticide Application and use **Issue ID** 151

IFA Issue - None

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

40 CFR 170, 171 Subchapter E Pesticide Programs
29 CFR 1910 OSHA General Industry Standards

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The standards identified in section 5 establish a comprehensive set of requirements that provide adequate environmental and safety protection for the recognized hazards, while meeting legal requirements

15. **Provide assumptions for implementation of standard(s).**

Current LBNL policy already follows these identified standards. No additional implementation or actions are required. The documents listed below are used to aid in the implementation of these standards.

Berkeley Lab Chemical Hygiene and Safety Plan, Pub 5341

Respiratory Protection for Lawrence Berkeley National Lab, LBID-2136

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Dean Decker; Rich Haddock

Pressure Equipment - Compressed Gas Cylinders **Issue ID** 152

This issue is covered by the Accelerator ID Team document on:
Compressed Gases

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910
29 CFR 1926

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CFC Article 74 (compressed gas)
CFC Article 80 (hazardous materials)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

CGA, ANSI, CFC, NFPA provide comprehensive and accepted coverage of the subject.

15. **Provide assumptions for implementation of standard(s).**

Use of compressed gases covers both industrial and laboratory-type uses at LBNL.

NFPA 45 - Fire Protection for Chems in Labs
NFPA 50A/50B - Gaseous/liquefied hydrogen systems
NFPA 51 - oxy-fuel gas systems for welding and cutting
NFPA 51B - fire protection for welding/cutting
NFPA 55 - storage, use, handling of compressed and liquefied gases in portable cylinders.
CGA Handbook of Compressed Gases
CGA P-1 Safe handling of Compressed Gases
CGA C-6 Standards for visual inspection of compressed gas cylinders
CGA S-1.1 safety relief device standards - cylinders for compressed gases.
ANSI B57.1 (Valves)
ANSI/UL 407 (manifolds)
ACGIH TLV
Chapter 13, PUB-3000

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☒ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rich Haddock

Pressure Equipment - Glass or Other Brittle Components **Issue ID** 153

Research gas systems often contain scientific glass ware components, and pressure systems may contain viewing ports. At times, it may be necessary to include other brittle components into research systems. Brittle components will generate hazardous fragments upon failure, and failure may be initiated by any scratch or defect in glass, for example.
The hazard needs to be addressed by operating at sufficiently low pressure to preclude hazardous fragment propulsion and/or through barricading and use of eye protection.

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910
29 CFR 1926

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The external standards noted are accepted industry standards for the topic areas and provide adequate coverage in concert with PUB-3000 provisions (Chapter 7), used as implementation guidance, as well as legal requirements.

15. **Provide assumptions for implementation of standard(s).**

PUB-3000 describes design and operating requirements for pressure systems with brittle components.

Use of brittle components is not covered by ASME codes. PUB-3000 addresses specific research requirements. It is based on good practice and on the Draft DOE Pressure Safety Manual.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☒ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rich Haddock

Pressure Equipment - Pressure Vessels **Issue ID** 154

Pressure vessels include air receivers attached to compressors, gas tanks, cryogenic storage tanks, hydraulic tanks, ASME rated pressure vesseld, and laboratory equipment under pressure. Standard pressure vessels that have an analog in industry are governed by ASME or federal and state requirements. Research systems which operate at greater than atmospheric pressures often are not covered by these regulations and at other times research requirements preclude conformance to ASME requirements.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☒ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910.169 (Air Receivers)
29 CFR 1910.106 (b) (1) (v)
29 CFR 1910.217 (b) (12)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

Title 8 Industrial Relations, State of California Admin. Code Part 1, Chapter 4, Subchapter 1 (Unfired Pressure Vessel Safety Orders)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

OSHA requirement

15. **Provide assumptions for implementation of standard(s).**

Implementation of this issue is through PUB 3000, Chapter 7 which cites 29 CFR 1910 supplemented by ASME Boiler & Pressure Vessel Code, Section VIII, Divisions 1 & 2. Some revision of this material is required.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☒ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rich Haddock

Pressure Safety - SRC **Issue ID** 156

* The section on Pressure was discussed.
It was agreed to remove the DOE Pressure Safety Manual and Pub3000 Chapter 7 from the set and instead note these as guidelines in the implementation phase. It was further agreed to keep the AMSE Boiler and Pressure Vessel Code, and to consider putting under implementation the ARI Stds, APIS 620 and CGA V-7.

ACTION: ID Team to consider revising Issue Forms and review noted standards
Various sections moved to implementation. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☒ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Pressure-Compressed Gases **Issue ID** 157

*Moderate
No Change

Clarification, addressed in the set. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rick Kelly

Pyrophoric Gas, Solid or Liquid **Issue ID** 158

Pyrophoric matierials react with air, either burning in some cases, causing an explosion. An example of a pyrophoric material at LBNL is silane.
See also the following Environmental ID Team issues:
For hazardous waste issues refer to "Waste, Hazardous and Mixed (non-radioactive component)" and for mixed waste issues refer to "Waste, Radioactive and Mixed (radioactive component)".
For transportation issues, refer to "Hazardous Materials Transportation, Offsite" and "Hazardous Materials Transportation, Onsite". Also please refer to ITD sheet entitled, "Hazardous Materials Inventory and Transportation."
See also: Hazardous Material Handling; Compressed Gases

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910
29 CFR 1910.1029 Cadmium (applicable portions)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CAC Title 24, Part 9, California Fire Code Article 80 (Hazardous Materials)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

CFC 80 in particular has a section devoted to pyrophoric materials. These consensus standards provide specific requirements and guidance that is entirely lacking in the OSHA code. These standards include provisions for laboratory scale work, which is where pyrophorics are used at LBNL. In general, LBNL use of pyrophorics is quite limited and the OSHA and CFC requirements, along with DOE guidance reference in section 15, form an adequate basis for safety.

15. **Provide assumptions for implementation of standard(s).**

Use of pyrophorics is limited to laboratory scale work at LBNL, and only a few labs. The general provisions for safet chemical handling provided in PUB-3000 complete the specific provisions from the CFC and provide a sound basis for a safety program.

In addition to referenced legal standards, California Fire Code Article 51 (semiconductor operations) deals with pyrophoric gas, notably silane; the DOE Handbook - Primer on spontaneous heating and pyrophoricity also is an excellent resource for the type of pyrophoric use at LBNL.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rick Kelly

Pyrophoric Gas, Solid or Liquid - SRC **Issue ID** 159

* Should the DOE Handbook be included in the set under Pyrophoric Gas?
There is no existing standard or law, so this handbook published 11/95 has been cited in the set. If a standard is to apply to only one application, that will be noted. This handbook should be considered to go under implementation.

ACTION: Lab Safety Team to consider revising Issue Forms
Moved to implementation. Ben Feinberg 11/10/96

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☒ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Chris Donahue

Radiation Dose Limits and Dose Assessment **Issue ID** 160

This issue addresses annual radiation dose limits for occupational workers, minors, members of the public, embryo / fetus, and dose limits for emergency situations. Also covered is the methods of assessing and reporting dose.

Related issues:
Lab ID Team : Radiological Protection Program ; Accelerator ID Team: On site exposure ;
Environmental Team: Environmental Radiation Protection

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

10 CFR 835 Subpart C

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Mandated standard. It is consistent with external standards, although more conservative in some cases.

15. **Provide assumptions for implementation of standard(s).**

Implement the requirements of 10CFR835 similar to the implementation of 10 CFR 20 in industry. The detailed RPP based on the selected standards will address the hazards to this particular site and will contain enforceable controls that comply with the regulation, but are tailored to site hazards.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Chris Donahue; Roger Kloepping; Edwin Njoku; Mike

Radiation Protection - Ionizing - SRC **Issue ID** 161

- Should Pub3000 Chapter 21 be referenced under Radiation Protection - Ionizing, Fixed Sources - X-Ray/Gamma?
The group agreed to remove this standard.

ACTION: Accelerator & Fixed Radiation Sources Team Leader to revise Issue Forms

PUB3000 section moved to implementation for irradiators. Ben Feinberg 11/10/96

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☒ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Mike Schoonover; Edwin Njoku

Radiation Protection of Human Subjects **Issue ID** 162

Use of radioactive materials and radiation producing devices on human subjects for diagnosis and clinical research
Protection of occupational workers and human subects from radiation. topics include informed consent, dose assessment, training and control methods
Related issues: Lab ID Team : Radiological Protection Program ; Radiation Dose Limits and Dose Assessment; Biological, Human Subjects

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

21 CFR50, 60, 361, and Subchapters H and J: Protection of human subjects, informed consent, Standards for clinical review boards for clinical investigations, medical device requirements, human subjects committee requirements.
45 CFR 46 and 10 CFR 745 Common rules for protection of human subjects.
CCR 17 Subchapters 4.5 and 4.6 Training requirements for technologists administering radiation to human subjects

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Federal legal requirements are mandated. Training requirements in 17 CCR are not covered elsewhere and are consensus external standards.

15. **Provide assumptions for implementation of standard(s).**

Implementation is in place at LBNL. Implementation covers the selected standards and also incorporates appropriate elements of the following guidance issued by the National Council on Radiation Protection:
NCRP 99 : QA for diagnostic imaging
NCRP 102: Medical x-ray, electron beam and gamma protection for energies up to 50 MEV (as applicable)
NCRP 105 : Radiation Protection for medical and allied health personnel (as applicable)

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Chris Donahue

Radiation Protection Program **Issue ID** 163

The Radiation Protection Program (RPP) is a required element of 10 CFR 835 compliance and commitments made in it are enforceable under the Rule.The RPPdescribes all programs that implement the rule. All aspects of radiation safety at LBNL, including environmental protection, public and employee protection, radioactive waste handling , and ALARA policy will be included in the RPP. The current RPP will be modified per the approved WSS Standards and will be increased in scope to include all issues noted above. The modified RPP will be submitted for approval by DOE as specified in 10 CFR 835.

Related issues: All ionizing radiation issues identified by the ID Teams

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

10CFR835 - Subpart B - "Radiation Protection Programs"
835.101

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

10CFR20.1101 "Radiation Protection Programs".

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

LBNL must comply with legal standards (10 CFR 835). 10CFR20 allows for the development of a comprehensive Radiation Protection Program which covers release of materials and effluents, environmental monitoring, waste disposal, etc).
The detailed RPP will facilitate more consistent evaluation of regulatory compliance by LBNL and DOE.

15. **Provide assumptions for implementation of standard(s).**

Implement the requirements of 10CFR835 similar to the implementation of 10 CFR 20 in industry. The detailed RPP based on the selected standards will address the hazards to this particular site and will contain enforceable controls that comply with the regulation, but are tailored to site hazards.

The existing RPP will require modification. The RPP and will require a revision to include exempt quantities for labeling, sewer release limits, environmental monitoring, waste disposal methods, the modified radiation safety training program, and others. Individual Authorizations and Activity Hazard documentation will be the basis of the RPP and will provide research and work with radioactivity with specific hazard precautions needed.

Nuclear materials transactions and inventory via the Nuclear Materials Management and Safeguards System (NMMSS) system (DOE Order 5633) should be considered as a necessary management requirement for nuclear material when implementing the RPP.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☒ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ralph Kopenhaver

Radiation Protection Rules - Kopenhaver **Issue ID** 164

Subject: Draft WSS set
From: ralph kopenhaver
Date: 9/18/96 9:06 AM

Based on the draft set distributed at the ES&H Policy Team Meeting below are my comments:

The broad addition of of 10 CFR 20 and CCR 17 to supplement 10 CFR 835 is neither necessary nor consistent with the ID Team Document. The ID Team Document (note: DOE Radiation Protection consensus to the wording in this
document has never been obtained) indicates that 10 CFR 835 is overly prescriptive. It goes on to say, however, that because it is broadly interpreted that no exemptions are needed. Only is a couple of specfic areas, e.g. sealed sources, does it justify the need for additional standards. LBNL legally must comply with 10 CFR 835, whether they do it thru a program that also complies with 10 CFR 20 or not is a management decision and should not be listed as a requirement in a contractual document (unless DOE for some reason wants to require them to also comply with 10 CFR 20).

Additionally, the broad inclusion of 10 CFR 20 in the set, with no explanation directly in the set, implies that 10 CFR 835 is not sufficient. This then questions the validity of the WSS sets at other OAK sites which does not include10 CFR 20. (And broadly at all other DOE sites, since LBNL's radiation hazards are hardly unique.)

For these reasons, I don't think I could ever concur with the broad inclusion of 10 CFR 20 into the WSS set.

Set was revised to include specific sections of 10 CFR 20 to deal with specific areas. Ben Feinberg 11/12/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ OG ☒ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Chris Donahue; Roger Kloepping; Edwin Njoku; Mike

Radiation Protection Rules - SRC **Issue ID** 165

* Why are both 10CFR835 and 10CFR20 in the set?
As DOE moves to external regulation in February, it's unclear how we'll handle this. This issue is being handled by a separate team in the N&S project.

ACTION: ID Team to Report outcome of this issue back to SRC

See issue ID # 164. Ben Feinberg 11/21/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☒ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. Issue (s) **Resp. Person** Chris Donahue

Radiation Safety Training **Issue ID** 166

This issue covers radiation safety training requirements for:
- Accelerator users
- Radioactive Material users
- Sealed Source users
- X-ray machine users
- Support Personnel (general employees)
- Radiological Control Technicians

Related issues: Lab ID Team : Radiological Protection Program ; Accelerator ID Team: On site exposure ;

2. Issue Origin ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. Is there a legal requirement (s) which applies to this issue? ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. Is a standard necessary to ensure adequate protection? ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. Necessary legal requirement (s)

10CFR835, "Occupational Radiation Protection" (DOE)

6. Were any non-value aspects of the legal requirements identified? ◉ Yes ○ No

If yes, continue; otherwise skip to 8.

7. Description of non-value added aspects of the legal requirement (s).

10CFR835 is overly prescriptive in training/requirements. Due to the variety of radiation hazards at LBNL, the training program should be able to be modified to be commensurate with the hazard. LBNL intends to comply with the spirit and intent of 10 CFR 835.

8. Is the legal requirement (s) sufficient? ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. Is there a non-required external standard(s) which addresses this issue? ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. External necessary standard(s)

11. Are the previously identified standard(s) sufficient? ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. Are the relevant internal standard(s) sufficient? ○ Yes ○ No

13. Describe internal standard(s) or describe new standard(s) to be developed.

14. Provide basis for selected standard(s).

10 CFR 835 is a legal requirement, but the training formality requirements are too prescriptive for LBNL's workplace .

15. Provide assumptions for implementation of standard(s).

Implement the requirements of 10CFR835 similar to the implementation of 10 CFR 20 in industry. The detailed RPP based on the selected standards will address the hazards to this particular site and will contain enforceable controls that comply with the regulation, but are tailored to site hazards.

CCR 30255 (or 10 CFR 19.12) gives general guidance that individuals "working or frequenting" any portion of a controlled area" must be instructed regarding risks and procedures and requirements associated with radiation or radioactive materials."The extent of these instructions shall be commensurate with potential radiological health protection problems in the controlled area". This general requirement would allow LBNL much more flexibility in providing appropriate, cost-effective training of radiation workers, Radiation Control Technicians and general employees. It would also allow recognition of appropriate generic training from other institutions.
A procedure similar to the one proposed in the 10 CFR 835 Training exemption requests (submitted 7/96) will be incorporated into the RPP. Preliminary determination by DOE- EH is that the proposed NTLF procedure meets the spirit of 10 CFR 835 and no exemption is necessary to operate in the manner requested.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☒ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Radiation Safety Training **Issue ID** 167

Minor
Add to box #7: LBL intends to comply with the spirit and intent of 10CFR835.

Added to the ID form. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ron Pauer; Robin Wendt, Nancy Rothermich

Radioactive and Non-Hazardous Portion of Mixed Waste **Issue ID** 169

Includes issue identified by work and hazard analysis:
Radioactive and Mixed Waste - Processing and Disposal.

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

49 CFR 173, 177 (DOT), Packaging, Shipping, Carrier Loading

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

Disposal Site Waste Acceptance Criteria
DOE Order 5820.2A, Chapter II, Transuranic Waste excluding 3.j(QA); Chapter III, Low-Level Waste excluding 3.i (QA) ; Chapter IV, Accelerator Produced Radioactive Material excluding 3.b(QA), Chapter V, Decommissioning Facilities excluding 3.e (QA)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Department of Transportation requirements legally apply to off-site transportation of wastes. DOE Order 5820.2A, Chapters II, III, IV establish the standard set required by the DOE and invoke the Waste Acceptance Criteria (WAC)of the disposal sites. These waste acceptance criteria are important for protecting the public, worker safety and health and the environment at the disposal sites. Specifically, they create important limitations on the composition of the waste and the waste packaging. The quality assurance references were deleted because the level of hazard o f Berkeley Lab waste does not warrant a standard developed for high operations.

15. **Provide assumptions for implementation of standard(s).**

The activities will be maintained at the current level with the exception of the preparation of certain waste planning and quality assurance documents, required by DOE Order 5820, which have been determined to be of no value. Certain wastes may be released as nonradioactive, according to release requirements (see issue: Release of Potentially Radioactive Contaminated Material and Property)

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☒ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Mike Schoonover; Philip Williams

Radioactive Materials - Access Control (Ngim) **Issue ID** 170

Date: 9/4/96 9:23 AM
Requirement: Limited access to Card-key controlled radiation areas.
How is work hindered: The two technicians that maintaine the Cardkey system, are not authorized to have there cardkeys work on these doors. Our standard proccedues to enter these rooms are always be escorted by EH&S or person responsable for that room. We do not go into these areas with just a verbal ok from anyone. When the authorized users can't enter due to a Cardkey problem, we are the ones that respond to open the doors when there is a malfuntion. Once repaires are made, we need a valid Cardkey to check that the door is functioning. Sometimes it takes a while to do the repairs. The person that clears the room for us leaves which does give us a way of check the repairs without either them waiting on us or we call them back and wait for them. If it still is broken the whole proccess starte over again.
Suggested alternatives: We really do not need radiation work training since we do not work with any of the materials. Radiation saftey tranning is what we need. Not the one that needs retraining every 6 months. And that is one of the main reasons we were told that it was hard for us to have access. We fully understand the need to have a person responsable for these rooms respond with us to clear the room. We should be trained in how to check ourselves for contamination. Up until now we just use the machines outside of these rooms and follow the directions. The reason we always check is that some of our equipment is up high and may not get scaned so we check each time we work in there. In all but one of the areas we were never told to check. Only in the tritium room in 75 that we are told to get checked after we are done working.
Additional comments: I would really like some feed back on this problem.
Thanks.
Requestor: Robert D. Ngim
Telephone Number: 486-6182
E-mail: rdngim@lbl.gov

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ OG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Mike Schoonover; Philip Williams

Radioactive Sealed Sources - Ryan **Issue ID** 171

Date: 9/2/96 5:30 PM
From: Ben Feinberg
Cynthia - For the lab team. Ben

I work with the LBNL sealed radioactive source program. I believe that the DOE exempt values for sources is far too complicated and that using the state guidelines would be as effective and much easier to manage.

Doug Ryan
EH&S Rad Protection

Addressed in standards and implementation. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rick Kelly

Radiofrequency (RF) Source **Issue ID** 172

RF is a combination of electric and magnetic fields in the range of 3 kHz-300 GHz. At high enough intensities exposure can cause burns, cateracts, behavior changes. At LBNL RF generators are used in Ion sources test bays. RF sources are used to boost power in the ALS storage ring.

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ◉ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ◉ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

Note: OSHA section on RF still on the books but effectively voided in 1974.

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

IEEE Standard C95.1-1991, Safety Levels with respect to Human Exposure to Radiofrequency Electromagnetic fields. 1992.

11. **Are the previously identified standard(s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ◉ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

LBNL will need to establish an internal standard for hazard communication on this issue.

14. **Provide basis for selected standard(s).**

There are only two widely accepted U.S. national consensus standards for RF/MW exposure: The IEEE C95.1 standard and the ACGIH TLV. The TLV is less fully documented than the IEEE. The TLV covers a narrower frequency range. The TLV provides standards only for occupational exposures, whereas the IEEE covers both occupational and non-occupational exposure situations.

15. **Provide assumptions for implementation of standard(s).**

If properly insulated systems are used RF exposure is not expected. Surveys of RF communication systems should be performed on some frequency, i.e., 2-3 years. EH&S is available on request to check RF research systems, if the user does not have instrumentation.
The following should also be considered in the implementation of an effective program:

-DOE Order 440.1 (applicable section relating to hazard communication for physical hazards)

-Establishment of PUB 3000 Non-Ionizing Radiation (NIR) chapter.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☒ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Mike Schoonover

Radiography **Issue ID** 173

This issue covers radiograpy of welds and other construction on site to determine physical integrity. Currently radiograpy is not performed by LBNL, but by California State-licensed contractors.
Related issues: Lab ID Team : Radiological Protection Program ; Radiation Dose Limits and Dose Assessment; Accelerator ID Team: On site exposure ;

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

10 CFR 835 Occupational Radiation Protection- DOE

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

17 CCR 30330 to 30337 inclusive - Special Requirements for Radiographic Operations Other Than In The Heali ng Arts

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

10 CFR 835 must be followed with respect to occupational workers. California contractors must follow 17 CCR as a legal requirement. If LBNL were to perform radiogreaphic operations, implementation of 17 CCR 30330 to 30337 would be appropriate and sufficient.

15. **Provide assumptions for implementation of standard(s).**

Implement the requirements of 10CFR835 similar to the implementation of 10 CFR 20 in industry. The detailed RPP based on the selected standards will address the hazards to this particular site and will contain enforceable controls that comply with the regulation, but are tailored to site hazards. It will be verified that State licensed contractors adhere to the requirements of 17 CCR 30330 to 30337. LBNL employees will be protected per the provisions of 10 CFR 835. If LBNL performs radiography, it will be iccordance with 10 CFR 835 and 17 CCR 30330 to 30337.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Chris Donahue; Roger Kloepping; Edwin Njoku; Mike

Radiological Emergency Response **Issue ID** 174

Covers requirements for return to work or resumption of activities when occupational dose limits have been exceeded, response to and mitigation of emergency condidtions, reporting of radiological incidents.

Related issues: Lab ID Team : Radiological Protection Program ; Radiation Dose Limits and Dose Assessment; Accelerator ID Team: On site exposure ;

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

10CFR835.1301 Subpart N - Accidents and Emergencies

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

10CFR835.1301 Addresses emergency response dose limits and reporting requirements. Section 1301 provides a table listing the guidelines for control of emergency exposures and training responsibilities. This requirement is legally mandated

15. **Provide assumptions for implementation of standard(s).**

Implement the requirements of 10CFR835 similar to the implementation of 10 CFR 20 in industry. The detailed RPP based on the selected standards will address the hazards to this particular site and will contain enforceable controls that comply with the regulation, but are tailored to site hazards.
Internal procedures will be developed required to fully implement a Radiation Emergency Response program.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Chris Donahue; Roger Kloepping; Edwin Njoku; Mike

Radiological Instrumentation **Issue ID** 175

Maintenance specifications, calibration methods and frequency , and control of instruments used for detection of radiation. Included are portable and fixed instruments used to monitor surface contamination, radiation exposure rates, and airborne contamination.

Related issues: Lab ID Team : Radiological Protection Program ; Accelerator ID Team: On site exposure

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

10CFR835.401 Section C
"Occupational Radiation Protection" DOE

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Legal standard must be followed

15. **Provide assumptions for implementation of standard(s).**

IImplement the requirements of 10CFR835 similar to the implementation of 10 CFR 20 in industry, using the requirements of 10 CFR 20 as a guide. The detailed RPP based on the selected standards will address the hazards to this particular site and will contain enforceable controls that comply with the regulation, but are tailored to site hazards. The provisions of ANSI Standard N323: Radiation Protection, Instumentation Test and Calibration will be used as a guide for implementation.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Radiological Instrumentation **Issue ID** 176

Consider putting appropriate ANSI standard in implementation.

Added to implementation. Ben 11/8/96

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Chris Donahue; Roger Kloepping; Edwin Njoku; Mike

Radiological Instrumentation - SRC **Issue ID** 177

* Radiological Instrumentation: Lab Procedure
The calibration of instruments to be outlined in a LBNL procedure should be removed and placed in implementation if required.

ACTION: Lab Safety Team to consider revising Issue Forms

LBNL procedure removed from set. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☒ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Chris Donahue

Radiological Posting and Labeling **Issue ID** 178

Warning posting of radiation areas, high radiation areas, radiological material work and storage areas. Labeling of individual quantities of radioactive materials.

Related issues:
Lab ID Team : Radiological Protection Program ; Accelerator ID Team: On site exposure ;

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

10CFR835 Occupational Radiation Protection (DOE)
Subpart F and G

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

10CFR20 Subpart J- Precautionary Procedures

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

10 CFR835 is a legal requirement. 10 CFR 20 contains industry standard conditions that exempt certain low levels of radioactive material from posting and labeling. There is no definition of radioactive material in 10 CFR 835, and no deminimus levels below which, posting and labeling is not required.

15. **Provide assumptions for implementation of standard(s).**

Implement the requirements of 10CFR835 similar to the implementation of 10 CFR 20 in industry. The detailed RPP based on the selected standards will address the hazards to this particular site and will contain enforceable controls that comply with the regulation, but are tailored to site hazards. 10 CFR 20 provides an exempt table listing quantities of isotopes for which labeling is not required. This table will be incorporated in the revised RPP and Pub. 3000.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☒ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Chris Donahue

Radiological Records **Issue ID** 179

Requirements for documentation of compliance with the radiation safety regulations and the Radiological Protection Program(RPP)

Related issues: Radiation Issues, such as Radiation Safety Training, Radiation Dose Limits and Dose Assessment, Workplace Radiation Monitoring.

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

10CFR835 Subparts H and I, Records and Reports

6. **Were any non-value aspects of the legal requirements identified?** ◉ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

10 CFR 835 requires uptake reporting for bioassay. This is not appropriate for chronic tritium uptakes.

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

10 CFR 20 Subparts L and M Records and Reports (for tritium, only)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

10 CFR 20 allows reporting dose equivalent based on body burden, a more appropriate practice for chronic tritium uptakes.

15. **Provide assumptions for implementation of standard(s).**

Implement the requirements of 10CFR835 similar to the implementation of 10 CFR 20 in industry. The detailed RPP based on the selected standards will address the hazards to this particular site and will contain enforceable controls that comply with the regulation, but are tailored to site hazards.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Chris Donahue; Roger Kloepping; Edwin Njoku; Mike

Radiological Product Defects ... - Confirmation Team **Issue ID** 180

ISSUE: Are we addressing defects in products (10CFR21)? Len Smith

Not applicable to Berkeley Lab. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Blodgett

Reactive or Explosive Chemicals **Issue ID** 181

A reactive/explosive chemical is defined as a substance or mixture that vigorously polymerizes, decomposes, condenses, or becomes self reactive due to shock, pressure, or temperature. The scope of the application of this topic is limited to storage, use, and control of reactive/explosive solid and liquid chemicals. Some examples of reactive /explosives stored or in use at the Berkeley Lab are: perchloric acid, sodium and lithium metals, hydrazine, sodium borohydride, aluminum chloride, aluminum nitrate, etc.
Also see the following ITD sheets for related issues/standards:
Lab ID Team - Peroxidizable Chemicals
Accelerator ID Team - Hazardous Materials Handling

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29CFR1910.1000, Air Contaminants, Permissible Exposure Limits (PEL's)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CAC Title 24, Part 9, California Fire Code Article 80 (Hazardous Materials)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The OSHA Standard (29CFR1910) prescribes requirements for health and safety in the workplace. Specifically, 1910.1000 lists exposure limits for airborne contaminants while more comprehensive Standards such as 1910.1450 (lab Std.) addresses work practices, controls, and training in a laboratory environment (as referenced from the Hazardous Materials Handling ITD sheet).

The CFC prescribes requirements for storage, handling, and containment of explosive/reactive chemicals.

15. **Provide assumptions for implementation of standard(s).**

The combination of legal requirements and recognized consensus standards form adequate and appropriate safety envelope for Berkeley Lab use of reactives/explosives. This framework has been noted as very successful in allowing work to proceed safely at similar R & D institutions. The Berkeley Lab use of reactives/explosives is limited to small-scale research applications involving relatively small quantities of reactives/explosives; testing of explosives on larger scale not performed at the Berkeley Lab. PUB-5341, Chemical Hygiene and Safety Plan (CHSP) covers comprehensive chemical storage, use, and control guidelines. Examples of the consensus standards are included on the Hazardous Material Handling Sheet.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Release of Potentially Radioactive Contaminated Material and Property **Issue ID** 182

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ◉ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ◉ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

DOE Order 5400.5, Chapter II, Paragraph 5 and Chapter IV
Application of DOE 5400.5 requirements for Release and Control of Property Containing Residual Radioactive Material (memo, dated 11/17/95)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

An industry standard site program will contain standards for release of material and property (both personal and real). The DOE release process was selected; this program is consistent with proposed 10 CFR 834. 10 CFR 20 does not include standards for release of material and property; however,standards are included in other NRC Regulations and Regulatory Guides. Chapter II, Paragraph 5, of 5400.5 was selected to establish a standard for release of property have residual radioactive material, and Chapter IV, for clean-up of residual radioactive material and management of the resulting wastes and residues. In addition, the DOE Office of Environmental Policy and Assistance has issued a memo, dated 11/17/95, "Application of DOE 5400.5 Requirements for Release and Control of Property Containing Residual Radioactive Material" which was selected because it contains important provisions for release of material with respect to surface levels of tritium.

15. **Provide assumptions for implementation of standard(s).**

Implementation will maintain those programs which are required for a smooth transition to program required by 10 CFR 834 regulation. Also, relevant and appropriate standards from 10 CFR 20 will be included in implementation. For example: 10 CFR 20.2001 permits radioactive decay and release of short half-life radioisotopes. California State Department of Health Radiologic Health Branch has guidelines for such a program. Also, 10 CFR 20.2005 allows release (as nonradioactive) of animals and liquid scintillation fluid containing less than 0.05 microcuries of H-3 or C-14 per gram.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Roger Kloepping; Edwin Njoku; Alan Jackson

Release of Potentially Volume-Activated Material **Issue ID** 183

Unrestricted release of potentially volume-activated material. This is material in which raionuclides may have been produced as a result of exposure to accelerator -produced radiation
related issue: Environment Team: Release of Potentially Radioactive Contaminated Material and Property

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☒ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ◉ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ◉ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

DOE Order 5400.5 Chapter II, 5.C, Chapter IV, 5.A
Application of DOE 5400.5 requirements for Release and Control of Property Containing Residual Radioactive Material (memo, dated 11/17/95)

11. **Are the previously identified standard(s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ◉ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

A new standard is required for unrestricted release for volume- activated material.

14. **Provide basis for selected standard(s).**

while DOE order 5400.5 has no specific criteria for the release of volume - activated materials it does address release of residual radioactive material in a general way. Chapter II, Paragraph 5, of 5400.5 was selected to establish a standard for release of property having residual radioactive material, and Chapter IV, for clean-up of residual radioactive material and management of the resulting wastes and residues. In addition, the DOE Office of Environmental Policy and Assistance has issued a (draft) memo, dated 8/14/95, "Application of DOE 5400.5 Requirements for Release and Control of Property Containing Residual Radioactive Material" which was selected because it contains important provisions for release of material with respect to material contaminated or activated in volume.

15. **Provide assumptions for implementation of standard(s).**

Will be incorporated into Pub 3000 and RPP.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☒ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Dean Decker

Repetitive Motion **Issue ID** 184

Core Team issue handled by Lab Safety Team

Berkeley Lab workplaces present a wide array of ergonomic hazards/concerns ranging from traditional video display terminal (VDT) use, materials handling, and other repetitive motion activities (e.g., pipeting). Berkeley Lab does not have ergonomic concerns that are unique from other typical work environments. Ergonomic hazards may result in cumulative trama disorders (CTDs) or repetitive motion injuries (RMIs).

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☒ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

Public law 91-596, Section 5 (a) (1) Occupational Safety & Health Act...compliance cited under "General Duty Clause"

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ◉ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

Note: The available approved external standards should be used as guidance.

11. **Are the previously identified standard(s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ◉ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

Berkeley Lab will update Pub-3000, Chapter 17, Ergonomics, and/or develop internal standards as needed to describe The Lab's program and requirements to minimize and control ergonomic risks.

The California OSHA Proposed (7/96 Draft)State Standard should be used as a primary example of fairly fundamental performance-oriented requirements. Other guidance documents noted in item 15 below should also be used in developing internal standards.

Pub-3000, Chapter 17, Ergonomics, establishes Berkeley Lab ergonomics policy and responsiblities and describes ergonomic principles (e.g., cumulative trauma disorders, basic principals, office ergonomics, and industrial ergonomics).

14. **Provide basis for selected standard(s).**

Currently: 1) there are no federal or California State regulations specific to ergonomic hazards, and 2) other standards are in draft or proposed states and/or are designed as guidelines to be used with professional judgement. Both federal and state governments have developed proposed regulations which have not been accepted to date, due to difficulty in getting consensus among the public, employers, and others over what should be regulated and required. The State of California appears to be closest to having a potentially acceptable repetitive motion injury (RMI) standard, but the future of this proposed standard is not known.

Given the absence of ergonomic regulations, and the breath and complexity of ergonomic issues, maintenance of internal standards is the recommended approach for Berkeley Lab.

15. **Provide assumptions for implementation of standard(s).**

No single standard or guideline covers all aspects of ergonomics or establishes minimum requirements that are appropriate in all cases. Berkeley Lab will use the following accepted, draft, and/or proposed standards, guidelines,

and tools as guidance in implementing an ergonomics program at Berkeley Lab. Berkeley Lab will continue its ergonomics program and use of PUB-3000, Chapter 17, Ergonomics.

• California OSHA Proposed (7/96 Draft)State Standard, Title 8, Chapter 4, Section 5110, Repetitive Motion Injuries. The proposed five-page standard: 1) applies to work, or similar work, that has caused RMIs to more than one employee in the last year, and 2) requires that the following types of objectives be achieved: risk-minimization program, worksite evaluations of a representative number of jobs, control of exposures, and training.

• ANSI/HFES 100, 1988, American National Standard for Human Factors Engineering of Visual Display Terminal Workstations. This is a detailed technical standard that specifies acceptable conditions representing implementation of human factors engineering principles and practices in the design of VDTs.

• NIOSH Work Practices Guide for Manual Lifting, Technical Report 81-122, 1991 revision. This guide provides health and safety professionals quantitative means for evaluating lifting and lowering jobs and resulting recommended weight limits.

• DOE Order 6430.1A, 1989, General Design Criteria, Section 1300-12, Human Factors Engineering. This nine-page section outlines general considerations for: 1) incorporating human factors engineering into the system design process; 2) human-machine displays, controls, alarms, labeling, and communications; and 3) work environment ventilation, lighting, noise, and space and equipment layout and design.

• Proposed ANSI Z-365, 1993 or 1996 draft, Control of Cumulative Trauma Disorders . This is a proposed, roughly 80-page, comprehensive, technical standard that specifies principles and practices for controlling a wide range of CTDs. The standard assumes and requires use by trained individuals and use of professional judgement, respectively.

• Federal OSHA Boston Regional Office Instruction to Inspectors Providing Guidance and Procedures for Ergonomic Inspections, January 6, 1993. This instruction provides guidance and procedures to be used by Boston OSHA for ergonomic inspections involving CTDs.

• Federal OSHA Technical Manual, Section VI - Ergonomics, Chapter 3 - Back Disorders and Injuries. Issued by OSHA Instruction TED 1.15, September 22, 1995. This section provides guidance to Federal OSHA for ergonomic inspections involving control of back disorders and injuries.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☒ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg; Dean Decker

Repetitive Motion **Issue ID** 185

Originally called "Ergonomics".
Minor
No Change

****

Response:
I'm not sure why this issue was raised at the CT meeting. Ben, any input? PGWilliams. 10/16/96.

The handling of this issue required clarification and discussion of the standards available. No changes were required. Ben 11/8/96

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Dean Decker

Repetitive Motion - Confirmation Team **Issue ID** 186

ISSUE: Should ANSI be in repetitive motion standards - Lichtenstein (for Dean Decker?)
[Also, consider the CAL OSHA draft standard].

These standards will be considered in drafting an internal standard. Ben Feinberg 11/21/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Dean Decker

Repetitive Motion - SRC **Issue ID** 187

* For Industrial Hygiene, is DOE Order 6430.1A still applicable to LBNL?
Phil Roebuck noted the LCAM order supersedes 6430.1A at LBNL. The discussion noted if the CFR specifically calls out 6430.1A then the CFR reference is all that is needed in the set. The agreement is to remove 6430.1A unless there is a particular section that the ID team wants included.

ACTION: Lab Safety Team to consider revising Issue Forms

* Is there anything in the set which would require a site-wide fix for an individual occurrence of repetitive motion injury?
No.

6430.1A moved to implementation. Ben Feinberg 11/10/96

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☒ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Dean Decker

Repetitive Motion - Steve Black **Issue ID** 188

Comments from OAK ES&H Policy Committee (Black)

Subject: Comments to Draft WSS Issues and Standards
From: steve black
Date: 9/16/96 10:12 AM

Carl,

2. Regarding the Repetitive Motion Section - This references a section in DOE 6430.1A. The "Building and FacilitiesSafety/Facilities Design" section correctly states that DOE 6430.1A has been replaced by DOE 430.1. This section needs to be corrected to match this fact. I don't know who did this section though, so can this comment be forwarded to the right person?

[Steve's other comments were on other issues, and were edited out of this form. Phil Williams, 9/23/96]

6430.1A has been removed, and an internal standard will be developed to deal with repetitive motion.
Ben Feinberg 11/12/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☒ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Dean Decker

Reproductive Toxin **Issue ID** 189

See also the following Environmental ID Team issues:
For hazardous waste issues refer to "Waste, Hazardous and Mixed (non-radioactive component)" and for mixed waste issues refer to "Waste, Radioactive and Mixed (radioactive component)".
For transportation issues, refer to "Hazardous Materials Transportation, Offsite" and "Hazardous Materials Transportation, Onsite".

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910.1000, Air Contaminants, Permissible Exposure Limits (PELs)
29CFR 1910.1450, Occupational Exposures to Hazardous Chemicals in Laboratories (Laboratory Standard)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CAC Title 24, Part 9, California Fire Code Article 80 (hazardous materials)
CCR Title 22, Division 2, Part 12000 (c), "Chemicals Known to the State to Cause Reproductive Toxicity" (consensus listing solely referenced to define reproductive toxins)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The legal requirements plus consensus standards offer adequate safety envelope for LBNL-type use of reproductive toxins; Prop. 65 (CCR Title 22, Division 2, Part 12000[c])provides listing of reproductive toxins (that has been recognized by consensus) . Warning label and notification requirements of Prop. 65 are not appropriate for LBNL small-scale, non-industrial use of reproductive toxins.

15. **Provide assumptions for implementation of standard(s).**

Use of reproductive toxins at LBNL is limited to small-scale laboratory use.

California Safe Drinking Water & Toxic Enforcement Act of 1986 (Ca lifornia HSCode Section 25249.5, Prop. 65)-(CCR Title 22, Div. 2, Section 12000). We need to discuss this regulation with Nancy Shepard.

NFPA 45 - Fire Protection for Labs using Chemicals
NFPA 704 - ID of Fire Hazards of Materials
NFPA 325 - Fire Hazard Properties of Flam. Liq., Gas, Volatile Solids
ACGIH TLV

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☒ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rich Haddock

Rotating Equipment - Centrifuges **Issue ID** 191

Centrifuges are typically used in life science type applications to separate materials in liquid solutions or suspensions. They range from small bench-top units which accept standard test tubes to ultra-centrifuges with speeds of up to 100,000 rpm. Centrifuge rotors may fail from failure to balance loads in the rotor, or from metal fatigue after extended use. Careful load balancing and rotor inspection are required. High speed rotors have a limited life expecttancy and need to be de-rated, i.e., used at lower speeds, when hours of operation at given speeds exceed the manufacture's recommendation. Typically centrifuges have interlocked covers and integral fragmentation shielding.
Centrifuges may also generate large amounts of aerosols, and use protocols need to address this.

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

The Berkeley Lab will ensure additional language addressing the hazards mentioned under 1. above, and incorporating manufacturers' recommendations and possibly ANSI Standard UL 1262 "Laboratory Equipment" Section 5.45 & 12.5 will be included as specific provisions in applicable PUB-3000 chapter.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☒ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rich Haddock

Rotating Equipment - Centrifuges - SRC **Issue ID** 192

* What about the ANSI Standard for Rotating Equipment - Centrifuges?
There was agreement to consider putting this under implementation.

ACTION: Lab Safety Team Leader to consider revising Issue Forms

Moved to implementation. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☒ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Sanitary Sewer **Issue ID** 196

Minor
No Change

Clarification of issue. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Sanitary Sewer Discharges **Issue ID** 197

Includes issues identified by work and hazard analysis:
EBMUD Permitted Facility
Non-permitted Discharges to Air/Water

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

Clean Water Act, 33 USC 1251 et. seq.
40 CFR 136, Analysis Procedures; 403, General Pretreatment Regulations; 433, Metal Finishing Point Source Category
Porter-Cologne Water Quality Control Act, CA Water Code Section 13000 et. seq. (except AEA discharges)
East Bay Municipal Utility District (EBMUD) Ordinance No. 311 - and all permits pursuant (except AEA discharges)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

10 CFR 20, Subpart K, Section 20.2003, Disposal by release into sanitary sewerage
17 CCR, Article 5, Waste Disposal, Section 30287, Disposal by Release into Sanitary Sewerage Systems
NOTE: The District imposes radiation discharge standards through its waste water discharge permit, but may not have been delegated this authority from the Atomic Energy Act. However, Berkeley Lab annually accepts these standards through formal approval of the waste water discharge permits.

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Sanitary sewer discharge compliance programs at the Berkeley Lab are based on the Clean Water Act. The Act's purpose is to control the discharge of pollutants tot he waters of the U.S. from both point and non point sources using various means, including development of pollutant discharge standards and limitations,and a permit system to enforce such standards. Authority to enforce the federal law has been delegated to California. The California Porter-Cologne Water Quality Control Act established a comprehensive statewide system for the regulation of water pollution in California. Sanitary sewer wastes are discharged to East Bay Municipal Utility District (EBMUD) public sewer system and EBMUD has adopted an ordinance which established a permit system for controlling discharges to its treatment facility. Since federal facilities no longer have a waiver of sovereign immunity under the Clean Water Act, Berkeley Lab must comply with related state and local laws and regulations.

15. **Provide assumptions for implementation of standard(s).**

Implementation should not result in any impact.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ron Pauer

Sanitary Sewer Discharges - SRC **Issue ID** 198

* There were questions about the Sanitary Sewer Discharges Standards
The discussion included the areas where we follow federal regulations and areas where we follow the local or state ordinances. We report annually to EBMUD on our radioactive discharges; the requirements are identical to NRC and rolls up to the same standard source. We're obligated to follow local ordinances for non-radioactive discharges.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☒ E ☒ LS ☐ CG ☐ PC ☒ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Seismic Safety - SRC **Issue ID** 201

* Under Building and Facilities Safety, is Pub3000 Chapter 23, Seismic Safety, needed?
After discussion, it was agreed to remove this from the set and note it in the implementation phase.

ACTION: Lab Safety Team to consider revising Issue Forms

This is not a Lab. Safety Team issue. Phil Williams 09/26/96.

Placed in implementation. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☒ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Site Environmental Report **Issue ID** 203

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ◉ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ◉ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

DOE Order 231.1, paragraph 5.d.2 (to the extent that it requires compliance)
DOE Manual 231.1-1,Chapter 1, Paragraph 1.a and 1.b

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

There is value added in the distribution of an annual environmental report, similar to reports provided by private industry and facilities regulated under 10 CFR 20 with Type A Broad Scope Licenses. By selecting only portions of the DOE Manual, which is referenced by the DOE Order, the prescriptive format and content requirements provided in DOE Headquarters guidance documents are eliminated. It includes selecting the October 1 deadline of each year as this has been determined to be reasonable. These requirements are consistent with those proposed in 10 CFR 834.

15. **Provide assumptions for implementation of standard(s).**

Implementation should result in a more reasonable report requiring less cost in preparation (by Berkeley Lab) and review (by Berkeley Lab and DOE), while providing useful information to the general public.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☒ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Site Restoration **Issue ID** 204

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

Resource Conservation and Recovery Act (RCRA) 42 USC 6901 et. seq.
Federal Water Pollution Control Act (Clean Water Act) (CWA) 33 USC 1251 et. seq.
40 CFR 260, 264 (Corrective Action for Solid Waste Management Units, Subpart S), 265, 268, 270, and 271
California Porter Cologne Water Quality Control Act - to the extent involving discharges of pollutants to navigable waters
23 CCR Division 3, Chapter 16, Article 5 (UST release abatement) and Article 11 (UST corrective actions)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

DOE Order 5400.5, Chapter IV (release of rad contaminated property and material)
East Bay Municipal Utility District Ordinance No. 311 (discharge of treated groundwater) (except AEA materials)
City of Berkeley Municipal Code 16. 12.30-32-34). Monitoring Well Ordinance - and all permits pursuant (except AEA materials)
SWRCB Model Well Ordinance, Water Code Section 801c (except AEA materials)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

In 1993, the Berkeley Lab was issued a Resource Conservation and Recovery Act (RCRA) Part B permit to operate its Hazardous Waste Handling Facility. The permit requires the Laboratory to investigate and remediate any past releases from Solid Waste Management Units (SWMUs) and Area of Concern (AOCs) as defined by RCRA. Site restoration includes investigation and remediation activities at these SWMUs and AOCs. Activities involving radioactive materials are addressed by the DOE Order.

15. **Provide assumptions for implementation of standard(s).**

Compliance activities will continue to meet the necessary legal requirements. In addition, DOE EM-40 Specific Initiatives (e.g., budget requests, project baselines, cost-savings plans, multi-year work plans, etc.) will continue to be supported at the present level.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rick Kelly

Static Magnetic Field > 5 gauss **Issue ID** 208

Static Magnetic fields are present in the following at LBNL:
Magnetic Imaging Devices Building 55A.
Static field magnetics used in accelerators.
Quadropoles used at Advanced Light Source (Building 6) along with undulators and wigglers.
Magnetic fields over 5 gauss are pacemaker and projectile concerns.
Areas need posting as chief control.

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ◉ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ◉ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

The ACGIH "Threshold Limit Values for Physical Agents: Static Magnetic Fields."

11. **Are the previously identified standard(s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ◉ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

LBNL will need to establish an internal standard for hazard communication on this issue.

14. **Provide basis for selected standard(s).**

There are only two widely accepted consensus standards for magnetic fields: The ACGIH TLV and the International Committee on Non-Ionizing Radiation Protection (ICNIRP) standards. The ACGIH standard was developed for the U.S., where the ICNIRP standard involves workers in foreign countries. The TLV standards are much more widely accepted in the U.S., and equally protective as the ICNIRP standards.

Berkeley Lab will use the TLV to assist in determining when additional employee protection is needed. ACGIH states that the TLVs are "...recommendations or guidelines... to be interpreted and applied only by a person trained in this discipline..." (i.e., industrial hygiene), and the ACGIH "...does not advocate..." the use of TLVs "...as legal standards."

15. **Provide assumptions for implementation of standard(s).**

This assumes that exposure to intense magnetic fields is limited to employees only. Fields over 5 gauss are pacemaker concerns. Areas where an individual can be exposed to fields 5 gauss or higher need to be mapped and posted. The majority of magnetics used at LBNL do not project fields over 5 gauss for more than a few inches from the source. Major exceptions are the MRI units in B55A. Their fields have been mapped and posting has been performed.

The following should also be considered in the implementation of an effective program:

-DOE Order 440.1 (applicable section relating to hazard communication for physical hazards)

-Establishment of PUB 3000 Non-Ionizing Radiation (NIR) chapter.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☒ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. Issue (s) Resp. Person

Surface/Storm water

Issue ID 212

2. Issue Origin ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. Is there a legal requirement (s) which applies to this issue? ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. Is a standard necessary to ensure adequate protection? ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. Necessary legal requirement (s)

Clean Water Act, 33 USC 1251 et. seq.
40 CFR 122, NPDES System; 136, Analysis Procedures
Porter-Cologne Water Quality Control Act, California Water Code, Division 7, Section 13001, et seq.- and all permits pursuant (except AEA discharges)
City of Berkeley Municipal Code 17.20, Reduction of Storm water Pollution (except AEA discharges)
Oakland Municipal Ordinance 11590, Storm water Management and Discharge Control (except AEA discharges)
For discharges of AEA materials, refer to the Environmental Radiation Protection Document

6. Were any non-value aspects of the legal requirements identified? ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. Description of non-value added aspects of the legal requirement (s).

8. Is the legal requirement (s) sufficient? ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. Is there a non-required external standard(s) which addresses this issue? ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. External necessary standard(s)

11. Are the previously identified standard(s) sufficient? ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. Are the relevant internal standard(s) sufficient? ○ Yes ○ No

13. Describe internal standard(s) or describe new standard(s) to be developed.

14. Provide basis for selected standard(s).

Surface/Storm water compliance programs at the Berkeley Lab are based on the Clean Water Act. The Act's purpose is to control the discharge of pollutants to the waters of the U.S. from both point and non point sources using various means, including development of pollutant discharge standards and limitations, and a permit system to enforce such standards. Authority to enforce the federal law has been delegated to California. The California Porter-Cologne Water Quality Control Act established a comprehensive statewide system for the regulation of water pollution in California. Since federal facilities no longer have a waiver of sovereign immunity under the Clean Water Act, Berkeley lab must comply with related state and local laws and regulations. Pollutants under the Clean Water Act do not include AEA regulated materials.

15. Provide assumptions for implementation of standard(s).

Current program is fully implemented.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Blodgett

Toxic Materials **Issue ID** 214

A toxic chemical is defined as a substance that has evidence of acute or chronic health hazard as listed in the NIOSH Registry of Toxic Effects of Chemical Substances (RTECS), and has a median lethal dose (LD_{50}) of greater than 500 mg/kg of body weight when administered orally to rats. The scope of the application of this topic is limited to storage, use, and control of toxic solid and liquid chemicals. Some examples of toxic chemicals stored or in use at the Berkeley Lab are: acetonitrile, acetic anhydride, dimethylformamide, phosphorous pentoxide, tetrahydrofuran, etc. Also see the following ITD sheets for related issues/standards:
Lab ID Team - Carcinogens, Reproductive Toxins, Highly Toxic Material; Accelerator ID Team - Hazardous Materials Handling

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

OSHA 29CFR1910.1000, Air Contaminants, Permissible Exposure Limits (PEL's)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CAC Title 24, Part 9, California Fire Code Article 80 (Hazardous Materials)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The OSHA Standard (29CFR1910) prescribes requirements for health and safety in the workplace. Specifically, 1910.1000 lists exposure limits for airborne contaminants while more comprehensive Standards such as 1910.1450 (lab Std.) addresses work practices, controls, and training in a laboratory environment (as referenced from the Hazardous Materials Handling ITD sheet).

The CFC prescribes requirements for storage, handling, and containment of toxic chemicals.

15. **Provide assumptions for implementation of standard(s).**

The combination of legal requirements and recognized consensus standards form adequate and appropriate safety envelope for Berkeley Lab use of toxic materials. This framework has been noted as very successful in allowing work to proceed safely at similar R & D institutions. The Berkeley Lab use of toxic chemicals is limited to small-scale research applications involving relatively small quantities of toxics. PUB-5341, Chemical Hygiene and Safety Plan (CHSP) covers comprehensive chemical storage, use, and control guidelines. Examples of the consensus standards are included on the Hazardous Material Handling Sheet.

16. Rate assumed impact on the Berkeley Lab of implementing standard(s).

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Davis

Traffic Hazards **Issue ID** 215

IFA Issue - motor vehicles - professional driver

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

Vehicle Code- State of California and implementing CCR sections
29CFR 1910 OSHA General Industry Standards
29 CFR 1926 OSHA Construction Industry Standards
49 CFR 40 Procedures for Workplace Drug Testing Programs
49 CFR 382 Controlled Substances and Alcohol Use and Testing

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The standards identified in section 5 establish a comprehensive set of requirements that provide adequate protection for motor vehicle safety, while meeting legal requirements.

15. **Provide assumptions for implementation of standard(s).**

The current program at LBNL implements these identified standards. No additional implementation activities are required . The documents listed below are used to aid in the implementation of these standards.

LBNL Pub 3000- Chapter 5
LBNL LBID - 2134 - Drug and Alcohol Informational Materials

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Traffic Hazards **Issue ID** 216

Minor
Moving 21 CFR 1308 Controlled Substances to new form.
No Other Change

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☒ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Chris Donahue

Transportation of Radioactive Materials **Issue ID** 217

This issue covers on-site and off-site transport of radioactive materials. Covered are packaging and shipping of radioactive materials and radioactive waste, and transfers from one controlled area to another.

Related issues: Lab ID Team : Radiological Protection Program ; Accelerator ID Team: On site exposure ; Facilities ID Team : Hazardous Material Transportation - Offsite and Hazardous Material Transportation - Onsite

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

49 CFR Subchapter C
IATA Dangerous Goods Regulations (37th edition)

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ◉ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ◉ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

On-site transportation of radioactive materials is currently addressed by LBNL, in Pub3000 and other internal EH&S procedures.

14. **Provide basis for selected standard(s).**

These requirements are Federal law and have been accepted industry standards for many years. LBNL uses standard industry practices for on-site transportation.

15. **Provide assumptions for implementation of standard(s).**

Federal Department of Transportation (Title 49) standards will be applied to off-site transportation only.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Chris Donahue; Roger Kloepping; Edwin Njoku; Mike

Transportation - Onsite - SRC **Issue ID** 218

* Why is Pub3000 in the set for transportation of radioactive materials?
There aren't any existing standards, and the California code is inapplicable and inappropriate for the Lab, so it's felt Pub3000 serves a purpose for transportation on-site.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ OG ☐ PC ☒ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

There aren't any existing standards, and the California code is inapplicable and inappropriate for the Lab, so it's felt Pub3000 serves a purpose for transportation on-site. The alternative approach is to develop a LBNL standard, based on the PUB-3000 guidance.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rick Kelly

Ultraviolet (UV) Source **Issue ID** 219

This refers to sources that emit ultraviolet (UV) radiation in the spectral region between 180 and 400 nanometers (nm). At LBNL these include:
Germicidal lamps
Germicidal hoods
Imaging devices (e.g., transilluminators)

It should be noted that exposure to UV is a skin cancer and burn hazard. (Isn't it also a hazard to eyes? PGW 9/28/96).

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ◉ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ◉ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

The ACGIH Threshold Limit Values for Physical Agents: Ultraviolet Radiation.

11. **Are the previously identified standard(s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ◉ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

LBNL will need to establish an internal standard for hazard communication on this issue.

14. **Provide basis for selected standard(s).**

The ACGIH TLV is the only widely accepted national consensus standard for occupational exposure to UV radiation. Berkeley Lab will use the TLV to assist in determining when additional employee protection is needed. ACGIH states that the TLVs are "...recommendations or guidelines... to be interpreted and applied only by a person trained in this discipline..." (i.e., industrial hygiene), and the ACGIH "...does not advocate..." the use of TLVs "...as legal standards."

15. **Provide assumptions for implementation of standard(s).**

The adequacy of this standard assumes the builders/users of UV-emitting equipment are provided with adequate guidance (i.e., design principles and use procedures).

UV is blocked by clothing, a poloycarbonate plastic, and glass. Intense UV source have been and will be survived to determine shielding needs and exposure duration limits. All sources checked to date, show more than adequate shielding exists.

The following should also be considered in the implementation of an effective program:

-DOE Order 440.1 (applicable section relating to hazard communication for physical hazards)

-Establishment of PUB 3000 Non-Ionizing Radiation (NIR) chapter.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☒ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** bartley

Unattended Operations **Issue ID** 220

This issue applies to instrumentation and equipment designed and/or set up to operate unattended when proper controls are in place. Examples of such operations extend from processes as simple as automatic siphoning pipet washers connected by rubber tubing to a water line to computer operated high pressure liquid chromatographic systems. Other examples commonly used in the Laboratory include high voltage electrophoresis systems, oligonucleotide systhesizers and sequencers, and polishing and grinding equipment.

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☒ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ◉ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ◉ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Equipment and instrumentation meeting the definition of this issue is designed to operate on an unattended mode but only if the appropriate controls and operations are observed and implemented. Hence, the standards for operation are set by each piece of equipment and the policies and guidance for adhering to these controls is appropriately in the purview of implementation of the overall ES & H program.

15. **Provide assumptions for implementation of standard(s).**

Edit EH & S Safety Manual in appropriate section(s) to provide warning with respect to appropriate care, training and precautions is using instrumentation designed to operate in an unattended mode.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☒ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Underground Storage Tanks (USTs) **Issue ID** 222

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☐ A ☒ E ☐ LS ☐ OG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

Resource Conservation and Recovery Act, 42 U.S.C. Section 6901 et. seq.
40 CFR280, Underground Storage Tanks
California Health and Safety Code, Chapter 6.7, Underground Storage of Hazardous Substances
CCR Title 23, Division 3, Chapter 16, Underground Storage Tank Regulations
City of Berkeley Ordinance, Chapter 11.52, Hazardous Materials Management - and all permits pursuant

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Berkeley Lab owns and operates many USTs which contain regulated substances, including petroleum products, and is required by law to comply with the selected standards.

15. **Provide assumptions for implementation of standard(s).**

Current UST program is fully implemented and will be maintained.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Rich Haddock

Vacuum Equipment - Back-Filled From Pressure Source **Issue ID** 223

When a vacuum system is back-filled from a compressed gas source, there is a possibility of over pressure and rupture of windows or of the vacuum vessel. Adequate pressure relief must be provided.
This issue also refers to Lab. Safety ID Team IFA issues:
Pressure Equipment - Glass or Other Brittle Components
Pressure Equipment - Pressure Vessels
Pressure Equipment - Stored Energy Greater than 100 KJ
Vacuum Equipment - Backfill from Pressure Sources
Vacuum Equipment - Windows Greater than 4 Inches

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

Pressure Relief Device 29CFR1910.101 (Compressed gases - general requirements)

6. **Were any non-value aspects of the legal requirements identified?** ◉ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

This standard does not explicitly address vacuum hazards. The only section that would apply is pressure relief devices.

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

CGA pamphlet S-1.1-1963 and 1965 addenda (Pressure Relief Device)
CGA pamphlet S-1.2-1963 (Pressure Relief)

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Since this hazard is not explicitly defined by an external legal agency, a combination of existing OSHA regulations, and CGA pamphlets is required.

15. **Provide assumptions for implementation of standard(s).**

Existing PUB-3000 requirements contain guidance for pressure relief and/or design alternatives in such circumstances. Implementation of this issue is through PUB 3000 which uses 29 CFR 1910.101 supplemented with the standards defined in the CGA pamphlets. Additional helpful information is contained in the Draft DOE PRessure Safety Manual.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☒ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Davis

Working at Heights, Slip, Trips and Falls, Housekeeping **Issue ID** 228

IFA Issues: fall from height - elevated platform
fall from height - fall protection equipment
fall from height - roofs
fall from height - scissors lifts

Facilities Issues: Slips, trips and falls
Housekeeping

2. **Issue Origin** ☒ Work and Hazard Analysis ☐ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910 OSHA General Industry Standards
29 CFR 1926 OSHA Construction Industry Standards

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

The standards identified in section 5 establish a comprehensive set of requirements that provide adequate safety protection for the recognized hazards, while meeting legal requirements.

15. **Provide assumptions for implementation of standard(s).**

The current LBNL Occupational Safety Program already follows these identified standards. No additional implementations or action is required. Appropriate chapters of LBNL Pub 3000 (i.e. one and five) are used to implement these standards.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Chris Donahue; Roger Kloepping; Edwin Njoku; Mike

Workplace Radiation Monitoring **Issue ID** 229

This issue deals with monitoring of the workplace to assure compliance with 10 CFR 835, especially with regard to radiation dose limits for occupational workers. Included are routine surveys of laboratory and work areas, including radiation, contamination and compliance review summaries. Frequency required and method of survey.

Related issues: Lab ID Team : Radiological Protection Program ; Accelerator ID Team: On site exposure

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

10CFR835, "Occupational Radiation Protection" DOE

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

LBNL must comply with legal standards.

15. **Provide assumptions for implementation of standard(s).**

Implement the requirements of 10CFR835 similar to the implementation of 10 CFR 20 in industry, using the requirements of 10 CFR 20 as a guide. The detailed RPP based on the selected standards will address the hazards to this particular site and will contain enforceable controls that comply with the regulation, but are tailored to site hazards.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☒ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Paul Davis

Workplace Ventilation **Issue ID** 230

IFA Issue - none

Facilities Issue- workplace ventilation

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☒ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

29 CFR 1910 OSHA General Industry Standards
29 CFR 1926 OSHA Construction Industry Standards

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Standards identified in section 5 establish a comprehensive set of requirements that provide adequate safety and health protection for the recognized hazard, while meeting legal requirements

15. **Provide assumptions for implementation of standard(s).**

Current LBNL Industrial Hygiene programs already follow these identified standards. No additional implementation or actions are required. The documents listed below are used to aid in the implementation of these standards.

Berkeley Lab Health and Safety Manual, Pub 3000

Berkeley Lab Chemical Hygiene and Safety Plan, PUB 5341

ASHRAE 62-1989 Ventilation for Acceptable Indoor Air Quality

ACGIH Industrial Ventilation Manual

ANSI / AIHA Z9.5 - 1992 Laboratory Ventilation

The American Conference of Governmental Industrial Hygienists (ACGIH) Bioaerosol Committee Guidelines for Assessment and Sampling of Saprophytic Bioaerosols in the Indoor Environment - 1987

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☒ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Roger Kloepping

X-Ray / Gamma **Issue ID** 231

X-Ray Machines and Electron Microscopes (Non-Medical)
Protection from radiation of occupational workers using x-ay-producing machines

Related issues: Lab ID Team : Radiological Protection Program ; Radiation Dose Limits and Dose Assessment; Accelerator ID Team: On site exposure ;

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☒ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

10 CFR 835

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

ANSI N43.2 Sections 5.2.1.1, 5.2.1.2, 5.2.2.3, 5.2.2.1.4, 6.5, 7.1

11. **Are the previously identified standard(s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ◉ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

LBNL PUB-3000, Chapter 21 (X-Ray Safety Section)

14. **Provide basis for selected standard(s).**

Legal requirements are mandated.

PUB 3000 Chapter 21 follows ANSI N43.2 (industry consensus standard) and supplements with specific LBNL X-ray safety requirements.

15. **Provide assumptions for implementation of standard(s).**

Implement the requirements of 10CFR835 similar to the implementation of 10 CFR 20 (CCR 17 in the case of California) in industry. The detailed RPP based on the selected standards will address the hazards to this particular site and will contain enforceable controls that comply with the regulation, but are tailored to site hazards. Implementation of ANSI N43.2 will be through PUB 3000, Chapter 21.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☒ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Roger Kloepping

X-Ray / Gamma - Irradiators using radioactive material **Issue ID** 232

IRadiation prtection requirements for rradiators using radioactive material. Protection of occupational personnel from radiation produced by irradiator sources (sealed radiation sources housed inside a shielded enclosure).
Related issues: Lab ID Team : Radiological Protection Program ; Radiation Dose Limits and Dose Assessment; Control of Radioactive Sealed Sources

2. **Issue Origin** ☐ Work and Hazard Analysis ☒ Identification Team ☐ Review Team

Group ☐ F ☒ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ◉ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

10 CFR 835

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ◉ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ◉ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ◉ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

ANSI N43.3 , Definitions, Sections 4.1, 5.1.1, 5.1.2, 5.1.4, 5.1.6.3, 5.1.5.2, 5.1.5, 7, 9.1, 9.2, 9.4, Annex 3

11. **Are the previously identified standard(s) sufficient?** ◉ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

Legal requirements are mandated.

ANSI N43.3 (industry consensus standard) has specific irradiator safety requirements.

15. **Provide assumptions for implementation of standard(s).**

Implement the requirements of 10CFR835 similar to the implementation of 10 CFR 20 (CCR 17 in the case of California) in industry. The detailed RPP based on the selected standards will address the hazards to this particular site and will contain enforceable controls that comply with the regulation, but are tailored to site hazards. Implementation of ANSI N43.3 will be through PUB 3000, Chapter 21.

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Aboveground Storage Tanks - Steve Black **Issue ID** 233

Comments from OAK ES&H Policy Committee (Black)

Subject: Comments to Draft WSS Issues and Standards
From: steve black
Date: 9/16/96 10:12 AM

1. Regarding the AST and Transformers section. The note in parenthesis after the Calif. Aboveground Storage Act, H&S Code, Div. 20., makes it sound like LBNL does not intend to issue the biennial AST "storage statements" (and corresponding fee) anymore. Is this true? The last one was due on 7/1/96. Do you know if they did it?

According to Ron, the reports are still issued and the fees are still paid. No change is anticipated in this program.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☒ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Fire - Property protection - Ralph Kopenhaver **Issue ID** 234

Subject: Draft WSS set
From: ralph kopenhaver
Date: 9/18/96 9:06 AM

Based on the draft set distributed at the ES&H Policy Team Meeting below are my
comments:

3. Lastly, the placement of property protection aspects for fire protection as a management issue seems to ignore the environmental protection that these requirements also provides. The SADs and EAs usually indicate the largest impacts are from a catastrophic accident like a fire. This would indicate to me that at least for some facilities, e.g. HWHF, that the property protection aspects of fire protection are necessary as those requirements also protect against envrionmental releases.

This aspect is included in the environmental team, potential contamination control issues.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☒ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Safety Video **Issue ID** 235

I manage a group of business software programmers in the Promenade Building at 1936 University Avenue. I recently hired two temporary contract programmers at a very high hourly rate. As a part of the process that accompanied their receiving employee numbers, cardkeys, and badges at Building 65, they were required to watch a safety video which didn't seem to them to be entirely relevant to their work in our office environment. Since I have not seen this video myself, I cannot personally judge the relevance of its content. However, I suggest that the requirement for office workers to view this safety video be reviewed in the context of the new "necessary and sufficient" guidelines.

Thanks.

Rich Nosek
Information Systems and Services

Implementation issue. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

LOTO Procedures **Issue ID** 236

1) The log-out & tag-out (LOTO) procedures have been very restrictive in the regular engineering, research and development of electrical and electronic equipment. Even regular small maintenance work has been hindered with the stringent regulations and procedures that are now in place.

Many methods and ways could be found to work safely without these stringent rules, but it is beyond the purpose of this message to go into details.

2) Stringent rules are now in place when a person needs to work on equipment with life Voltage of 50 V. or more. In the past (before the "Tiger Team") this threshold was higher and safety rules were in place. The lower voltage level of 50 Volt seems excessively conservative and hinders many ways engineers and technicians perform their job.

Jan deVries

Standards will allow more efficient implementation in the future. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ OG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Seismic restraints on small equipment **Issue ID** 237

Requirement: Excessive seismic restraints on small equipment
How is work hindered: It is costly and requires using manpower time
It prevent flexibility in lab settings
Suggested alternatives: Put size and weight limit, not just 36" high
Requestor: Edith Bourret
Telephone Number: 5553
E-mail: edb@ux5.lbl.gov

Flexibility included in implementation, facilities design issue. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Strobe lights **Issue ID** 238

Requirement: LBL has been added strobe lights as part of the fire alarm system. These strobe lights are in bathrooms, in hallways etc.
How is work hindered: When the fire alarm system goes off (which is several times a year for malfunction or tests), I have to pass by several strobe lights, as I leave the building. Unfortunately, the strobe lights give me migraine headaches. I have lost work hours and been sick for several days because of these strobes. It is a medical fact that bright lights cause migraine headaches
Suggested alternatives: These lights are expensive to install. Reduce the number of lights. Most are unneeded. Use a lower intensity light.
Additional comments: The reason for the lights is for hearing impaired people. The lights are only needed in places where hearing impared people work alone.
Since there are very few people at LBL who cannot hear a fire alarm bell, they could get a device which transforms a loud noise to a detectible signal.
Requestor: Howard Matis
Telephone Number: x5031
E-mail: HSMatis@lbl.gov
Implementation issue. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ OG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person**

Cryogen Handling **Issue ID** 239

Requirement: Protective gloves must be worn when handling cryogens (IN2)
How is work hindered: When small amounts of IN2 are poured, it frequently splashes. If it hits your skin, it evaporates immediately, resulting in no serious burning. If one wears the gloves as instructed and IN2 gets into the glove, serious burns result. Removing the gloves in time to prevent burns is difficult.
Suggested alternatives: 1) Don't recommend gloves. 2) When stating that gloves should be worn, explain this danger to employees so that they can use their judgement. 3) Gloves that come to the elbow might be more difficult to get IN2 into in the first place.

Implementation issue. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Accelerator Safety Order **Issue ID** 240

The regulation that has given AFRD the most unnecessary hassle and expense, in my opinion, is the Accelerator Safety Order. The problem is that the order is very open to interpretation. For a while DOE took the approach that all accelerators, no matter how large, no matter whether they had 300 users or were just a benchtop experiment with no users, should go through an extensive expensive review process. Lately there has been emphasis on a graded approach, but what that is is left open to the opinion of unspecified people in DOE. The result has been that we do not know what is required for medium-sized or very small experiments. We send in to DOE requests for what we consider reasonable (necessary and sufficient) review procedures based on Pub 3000 for the non-user facilities, but we never get back approval or disapproval. The site office has been very cooperative and reasonable, but has been impossible to know whether we are obeying the order or not. Let me be clear that I believe the ASO is a very good set of regs for facilities like the ALS. But I believe that we have to separate user and non-user facilities for regulatory purposes, and make some kind of explicit graded approach between small and large experiments. It also needs to be very clear who can give exemptions or interpretations, and that process needs to be quick, not infinitely long, as it literally has been.

This kind of thing comes up again in NEPA/CEQA, because in both cases the definition of an accelerator is very broad. NEPA defines an accelerator as anything that accelerates particles-- leaving the ALS and an ion source or tv tube in the same category. With NEPA we have not had nearly the problems that we have had with the ASO because we spell out clearly what size hazard we are dealing with, and approval is local and vested in one person. But that has meant not calling a small accelerator an "accelerator" in the documentation, but rather spelling out its hazards and impact on personnel and the community and environment. I wish we could use the "accelerator" word without triggering an avalanche of paperwork.

Thanks.

Chris Celata

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ OG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Stakeholder Notification **Issue ID** 241

Notification of SH insufficient

Process will continue, with annual report available for stakeholders, allowing input. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ OG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Laws **Issue ID** 242

Why do we get to choose laws?

The standards include all laws having jurisdiction over Berkeley Lab which pertain to the work and hazards at Berkeley Lab. In general, since Berkeley Lab is a federal instrumentality, it is subject to federal laws and regulations to mitigate and control the work-related hazards and provide protection of workers, the public, and the environment. Therefore these are included in the set. State laws and regulations and local ordinances are also included if the applicable federal law contains a waiver of federal sovereign immunity, making federal facilities subject to state and local laws to the same extent as nonfederal facilities. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ OG ☐ PC ☐ SRC ☒ SH ☐ CT

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If yes, continue; otherwise skip to 12.

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☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Regulator inclusion **Issue ID** 243

How are regulators included in the process?

Regulators are included as stakeholders. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

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If yes, skip to 9; otherwise skip to 14.

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If yes, continue; otherwise skip to 8.

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If no, continue; otherwise skip to 14.

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If yes, continue; otherwise skip to 12.

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11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

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16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Minimal compliance unacceptable **Issue ID** 244

Berkeley Lab should not only comply with the laws and these standards, it should consider actions in excess of these standards.

The standards set includes over 50 standards in excess of the laws, and many more guidance documents under implementation assumptions. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

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If no, continue; otherwise skip to 5.

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☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

California Drinking Water Standards **Issue ID** 245

What are the pathways of drinking water contamination, and shouldn't the Lab adopt the Claifornia standards, which are more protective?

California Drinking Water standards, CCR Title 17, are included in the LBNL Drinking Water Program, which is included in implementation. These cover the cross-connection issue, which protects against drinking water contamination. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

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8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

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If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

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☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Volume Activation Standard development **Issue ID** 246

Public should be included in the development of the standard.

Independent experts will be solicited to develop standards. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

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If yes, skip to 9; otherwise skip to 14.

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☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Accelerator Narrative not self-evident **Issue ID** 247

Narrative has been corrected. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

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☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Endangered species protection **Issue ID** 248

Narrative revised to clarify LBNL responsibilities. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ OG ☐ PC ☐ SRC ☒ SH ☐ CT

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If yes, continue; otherwise skip to 12.

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☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Right to know **Issue ID** 249

Narrative revised to clarify LBNL responsibilities. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

   Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

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    ☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Accidental Releases **Issue ID** 250

LBNL voluntarily complies with state and local codes, to the extent that reporting thresholds are consistent with those of the state. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

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☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Pesticide runoff **Issue ID** 251

Already included in set under local regulation of surface/storm water. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

   Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

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    ☐ Major positive impact ☐ No net impact ☐ Major negative impact
    ☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Storm water fees **Issue ID** 252

Where are fees paid, and for what?

Fees are paid to Berkeley Toxic Management Division for services including time spent on inspections, meetings, report review, and documentation efforts. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

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☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Independent verification of radioactive emissions **Issue ID** 253

Emissions are regulated by EBMUD, BAAQMD, and DTSC. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

   Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

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    ☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

On-site transportation of hazardous waste **Issue ID** 254

Implementation in PUB-3000 provides for packaging to meet DOT standards, with the exception of providing a DOT manifest. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

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☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

QA Sections of 5820.2A **Issue ID** 255

QA is included in the contract between DOE and UC under the ESH management orders. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

   Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

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    ☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

NEPA compliance **Issue ID** 256

DOE will continue to comply with NEPA for Berkeley Lab activities. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

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4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Site Environmental Report **Issue ID** 257

By selecting only portions of the DOE Manual, which is referenced by the DOE Order cited, the prescriptive format and content requirements provided in DOE Headquarters guidance documents are eliminated. This will allow the format and contents to be revised so that the report is appropriate for activities at the Berkeley Lab.
Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ OG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Confirmation team independence **Issue ID** 258

Confirmation team included 7 of 17 members with no DOE or National Laboratory connection, and no financial interest in the standards selected. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Ben Feinberg

Waste minimization **Issue ID** 259

Waste minimization is included in the set, waste minimization experts and researchers have been in contact, and these interactions will be expanded during implementation. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☐ PC ☐ SRC ☒ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Phil Roebuck

Cite Specific Standard Revision **Issue ID** 260

LBNL Integrated Safety Management System will include revision control. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

   Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☒ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

   If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

   If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

   If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

   If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

   If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

    If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

    ☐ Major positive impact ☐ No net impact ☐ Major negative impact
    ☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Phil Roebuck

Lack of ESH Management Standards **Issue ID** 261

Scope of WSS is work/hazard specific. LBNL and DOE will implement an Integrated Safety Management System that will allow the ESH management standards to be revised. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☒ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Phil Roebuck

Future changes to standards **Issue ID** 262

Process to be established as part of the LBNL Integrated Safety Management System. Ben Feinberg 11/10/96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☒ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** O Yes O No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

12. **Are the relevant internal standard(s) sufficient?** O Yes O No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Phil Roebuck

Document Dissent **Issue ID** 263

Consensus is the norm in WSS, but authority should be identified to allow dissent, and a final decision.

Charter identifies convened group as decision authority. Ben Feinberg 11/10/ 96.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☒ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** O Yes O No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** O Yes O No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

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If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** O Yes O No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** O Yes O No

If yes, continue; otherwise skip to 12.

10. **External necessary standard(s)**

11. **Are the previously identified standard(s) sufficient?** O Yes O No

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15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

BERKELEY LAB IDENTIFICATION TEAM DOCUMENT

1. **Issue (s)** **Resp. Person** Phil Roebuck

Validation and length of standard set **Issue ID** 264

Is the list shorter and more effective than the previous? Are we validating it?

WSS list is longer, since DOE rollup of many standards into a few orders is not included.
Confirmation team provides initial validation.

2. **Issue Origin** ☐ Work and Hazard Analysis ☐ Identification Team ☒ Review Team

Group ☐ F ☐ A ☐ E ☐ LS ☐ CG ☒ PC ☐ SRC ☐ SH ☐ CT

3. **Is there a legal requirement (s) which applies to this issue?** ○ Yes ○ No

If no, continue; otherwise skip to 5.

4. **Is a standard necessary to ensure adequate protection?** ○ Yes ○ No

If yes, skip to 9; otherwise skip to 14.

5. **Necessary legal requirement (s)**

6. **Were any non-value aspects of the legal requirements identified?** ○ Yes ○ No

If yes, continue; otherwise skip to 8.

7. **Description of non-value added aspects of the legal requirement (s).**

8. **Is the legal requirement (s) sufficient?** ○ Yes ○ No

If no, continue; otherwise skip to 14.

9. **Is there a non-required external standard(s) which addresses this issue?** ○ Yes ○ No

If yes, continue; otherwise skip to 12.

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11. **Are the previously identified standard(s) sufficient?** ○ Yes ○ No

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12. **Are the relevant internal standard(s) sufficient?** ○ Yes ○ No

13. **Describe internal standard(s) or describe new standard(s) to be developed.**

14. **Provide basis for selected standard(s).**

15. **Provide assumptions for implementation of standard(s).**

16. **Rate assumed impact on the Berkeley Lab of implementing standard(s).**

☐ Major positive impact ☐ No net impact ☐ Major negative impact
☐ Minor positive impact ☐ Minor negative impact

Management Minutes

MEETING MINUTES
May 16, 1996
Team Leaders Meeting For IFA/N&S

ATTENDEES

May 16, 1996: Don Bell, Jack Salazar and Kam Tung met to review and to discuss the status of the Integrated Functional Appraisal (IFA). The highlights of the meeting follow:

1 - Team Leaders and Project Schedule

The selection of team leaders are complete and the project schedule is revised. Don Bell and Jack Salazar will notify the selected team leaders listed below and the assigned division(s):

Team Leader Division Proposed Schedule

D. Balgobin EH&S 6/10 - 7/1

P. Davis Physics 6/3 - 6/24 (Pilot IFA is complete; some fine tuning may be needed in the area of work

definition and format)

Engineering 6/24 - 8/5

P. Blogett SBD 6/3 - 6/24 (Pilot IFA is complete; some fine tuning may be needed)

ESD 7/8 - 7/29

D. Tudor CSD 6/24 - 7/15

LSD 7/29 - 9/9

B. King MSD 7/15 - 8/5

E&E 8/5 - 9/2

R. Kloepping NSD 7/15 - 8/12

K. Gershon AFRD 7/8 - 8/5

G. Perdue ALS 7/22 - 8/19

R. Connelly Facilities & 7/22 - 9/2

Ops Support

Action: Don Bell and Jack Salazar will notify the above individuals, who have been selected as team leaders, and firm up the schedule. Kam will finalize the schedule after all team leaders and division ES&H coordinators have had the opportunity to review the proposed schedule. The division ES&H coordinators will be consulted on the proposed schedule during the upcoming IFA briefing meeting, May 29, 1996.

2 - Administrative Support

It was concluded that one dedicated admin. support person is needed. This person will assist the team leaders to collect information (JHQ, Chemical Inventory, AHD, Rad Inventory, RWA, ORPS, Division Self-Assessment, SRC MESH Appraisal Reports, Division ES&H Documents and floorplans and Division Notebook etc...) , to distribute the information to the team leaders and the team members, and to enter the risk survey worksheet data to the IFA database.

Action: Kam will contact Jeffrey Chung and ask for his support.

3 - Risk Survey Worksheet Database QA

The risk survey worksheet data would be entered by Admin. Support person to the IFA database. We would like OAA to perform a QA on these data.

Action: Kam will ask Irene Kan for her support. (Irene was contacted on May 17, 1996 and she accepted our request and is willing to assist us.)

4 - Team Leaders Meeting

A meeting will be held with all the team leaders. The purpose of the meeting is to review the IFA work definition and hazard identification activities in detail and to ensure that we are all on the same page.

Action: Kam will schedule the meeting for May 30, 1996 and have a draft template for the IFA work definition and hazard identification summary report for distribution. Jack Salazar will finalize the detailed procedures for conducting the IFA by the end of May, 1996.

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of May, 22 1996

Present:
LBNL: B. Feinberg, K. Berkner, D. McGraw, C. Tilden; **DOE/BSO:** D. Nolan, P. Roebuck; **DOE/OAK:** C. Simkins, Phill Hill; **DOE/HQ:** Charlie Billups (telecon); **Fermi:** L. Coulson

Scope

The scope and duration of the N&S process was discussed, as was the set of deliverables and expected outcome. See attached draft Charter for details. It was agreed the process should be about 100 days. It was further agreed that clarity and agreement of the scope and deliverables is needed. A statement of reason and intent will be developed and signed by the Approval Authorities and will be published in the Lab newspaper.

Definition of Teams

Ben gave a presentation which included the draft structure and proposed members of the identification teams (see attached draft Charter). High level criteria needed for the confirmation of team members was agreed to. The IFA teams are to be chosen by the ES&H Division Director and the two Deputy Directors and approved by the Process Leader. The Standards Identification Team members are chosen by the Convened Group.

Teams will be finalized at next week's Convened Group meeting. The structure of the teams was discussed; Ben will present revisions to the structure at the next meeting.

Training

Agreement was reached with DOE/HQ on N&S Training at LBNL. Since LBNL has completed the NTLF Pilot and four members of the Convened Group have completed DCS training, the N&S process can begin with concurrent training offered by LBNL trainers and use of the on-line DCS training. Plans for follow-up training with David Short (or equivalent DCS trainers) were initiated, and tentative agreements are for training to be held in early June. Senior management will participate in the 2-hour training, and all others will take the 6-hour training.

Action Plans

Arrangements for public announcements were made. An announcement will be made in the LBNL newspaper on 5/31/96, and the signed statement of reason and intent will be published 6/7/96.

A Reason and Intent Statement was drafted and will be finalized by Ben Feinberg and Phil Roebuck.

The Kick-Off Meeting was planned. The agreement was to involve a wide audience of the Lab community. Speakers are to include Director Shank: 7 Principles including N&S; M. Domagala (Dep.Mgr. OAK): DOE endorsement, expectations; B. Feinberg:
Outline N&S Process @ LBNL, Fermi Lab experiences; Phil Williams: N&S at NTLF.

There was discussion of identifying stakeholders and when and how to involve them in the process. It was agreed that this will be clarified and announced soon.

The Convened Group protocol was discussed (see attached draft Charter). The next Convened Group meeting will be May 29, 1996.

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of May 29, 1996

Present:
LBNL: B. Feinberg, K. Berkner, D. McGraw, J. Bartley, P. Williams; **DOE/BSO:** D. Nolan, P. Roebuck; **UCOP:** H. Hatayama, K. Groves; **DOE/HQ:** D. Nelson (telecon).

Kick-Off Meeting

The invitees to the kick-off meeting will include Division Directors. We need to be able to convey to them the benefits and investment required by the N&S process. C. Billups will be attending the kick-off and representing DOE/HQ. We want to have a unifying theme which expresses the bottom line of: improving ownership, safe behavior and allowing safety to happen more effectively.

Kick-Off Meeting Agenda

1. C. Billups (DOE/HQ) 5 minutes
   - Both Martha Krebs (DOE-ER) and Secretary O'Leary support the N&S Process and are committed to making it a success.
   - Provide the corporate view and how HQ has institutionalized the concept.
   - Understand that programs are concerned about safety and want to get back to work.

2. M. Domagala (DOE/OAK) 5 minutes
   - Conveying the value of the effort, partnering between DOE and the lab, N&S is a new way of doing business and a new relationship. Set the priority of operational benefits.
   - N&S is a bottom up approach.

3. K. Berkner (LBNL) 10 minutes
   - Resources - the N&S process will require an up-front investment, but pay-off in the long run.
   - Everyone will be involved.
   - DOE is willing to change and now we have to do our part of the bargain.
   - We want to do this as fast as possible.
   - Give an example of the process.

4. D. McGraw or L. Coulson (LBNL/Fermi) 5 minutes
   - Pilot experience
   - Programs will learn more about EH&S and vice-versa.
   - Mutual understanding.

5. B. Feinberg (LBNL) 30 minutes
   - Five boxes.
   - Explain the process.
   - We are going to make use of the documentation which we have.
   - Identify the work and associated hazards.
   - Choosing standards. Industrial standards for industrial work. Using existing standards, not reinventing standards.

6. Discussion
   - What to anticipate over the next few weeks.
   - Participation on a team.
   - November 1st. The process has a finite length of time.
   - Subject mater experts will document standards.
   - Teams (IFA, ID).
   - At the end of the process, the new standards will be incorporated into the contract between UC and DOE. The contract will be signed locally by Turner and Shank.
   - Limited to technical standards, but we have a vision which will take us to implementation.
   - Give researchers ES&H options, rather than prescriptive DOE Orders.
   - Doing everything that makes sense and getting rid of everything that doesn't.
   - Cost effective.
   - We want to be in the top 25%, not top 1% of comparable industry safety. Benchmark ourselves.
   - We will involve stakeholders soon thereafter. They will be allowed a comment period on both the process and product. We will consider their comments, but they will not have approval rights.

Agenda for Next Meeting

- Finalize charter.
- Approve team members.
- Review Radiological Work Authorization as a sample data gathering tool.
  - Describes procedure, but not purpose of work.
  - We will use existing documentation and fill in blanks.
- Detailed look at schedule.
- The convened group will meet weekly on Wednesday from 10 a.m. - 12 noon until November 1st.

Action Items

- Have C. Shank invited Division Directors and Heads - Berkner
- Invite Division Safety Committees - D. McGraw
- Check with Larry Coulson - D. McGraw
- Brief C. Billups - P. Roebuck
- Provide auditorium and audo/video set up - F. Gee
- Develop IFA correspondence with Process Element 1 - J. Bartley
- Look into details of Contract Modification - H. Hatayama, P. Roebuck
- Identify LLNL observers - K. Groves
- Finalize letter and obtain signatures - B. Feinberg, P. Roebuck

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING
Minutes for meeting of June 5, 1996

Present:
LBNL: B. Feinberg, K. Berkner, D. McGraw, J. Bartley, P. Williams; **DOE/OAK:** C. Simkins, Phill Hill (telecon); **DOE/BSO:** D. Nolan, P. Roebuck; **UCOP:** K. Groves (telecon); **DOE/HQ:** ____ ; **FNL:** L. Coulson; **LLNL:** J. Sims (telecon)

- **IFA Output**

The IFA plan for guidance and reporting was discussed with reference to DOE M 450.3-1 and completeness of covering LBNL work. Input from the Fermi and NTLF pilots and the DCS Standards Process Action Teams approach was added to the discussion. It was agreed that the IFA plan provides the framework for an ongoing performance-based approach, and that it covers the N&S Process Element No. 1.

ACTION: Phil Roebuck will coordinate a DOE review and submit any comments by next meeting.

- **CHARTER**

The draft Charter was reviewed and suggestions for revision were made. It was decided that the Charter should provide a thorough description in order to be of greatest use to the project. Ben will coordinate the discussed revisions and each member will check for any minor changes needed. The final version will be reviewed at the next meeting.

ACTION: Submit annotated changes to Ben (via Cynthia fax: 6060)

• TEAM MEMBER APPROVAL

The group agreed on the importance of creating teams with excellent and thorough knowledge of the work and standards, and with effective team skills. The proposed DOE members were discussed and approved by the group. The Lab members were discussed and approval will be finalized at the next meeting.

• OTHER ITEMS

Scope: There was agreement to limit this N&S initiative to the EH&S area.

Two documents were drafted and distributed: a charge from the Convened Group to the ID Teams, and a selection letter from the Agreement Parties to the ID Team members.

Hazard Analysis: The group reviewed the Radiological Work Authorization as a sample data gathering tool and discussed the use of existing documentation.

The schedule was reviewed.

MEETING MINUTES
June 7, 1996
Team Leaders Meeting For Ifa/N & S

ATTENDEES:

J. Bartley, D. Bell, P. Blodgett, S. Buckley, J. Chung, R. Connelly, P. Davis, I. Kan, B. King, J. Salazar, & K. Tung

PURPOSE:

This meeting was held to initiate coordination among EH&S designated team leaders on logistics and other considerations associated with conducting work and hazard identification for the preliminary phase of the integrated functional appraisal (IFA)/ Necessary & Sufficient (N & S) process.

DISCUSSION ITEMS:

1. Proposed Schedule - The proposed Laboratory schedule for completion of the work and hazards identification, organized by division, was presented for comment. There was an attempt in this latest version of the schedule to make allowances for and manage individuals' participation and effort throughout the process. The indicated time frame associated with each division is to include: collection of pertinent ES&H information; initial hazards/work identification; representative field verification of data, as well as completion of the division summary report by the team leader and review of this material by the assessed division (with researcher/line input whenever possible).

Guidance was also given as to time allocation for certain activities associated with work/hazards identification. For those divisions with more complex issues or with a larger number of work spaces (e.g., Engineering, Facilities, Life Sciences), the five week time span estimated for work/hazards identification, could be broken up as follows: two weeks for initial identification; two weeks for field verification and report generation; and, one week for division review and approval of the summary report. For those less demanding divisions, as far as this process goes (e.g., Computing Sciences, Operations), the allotted time would be one week for initial identification activities, one week for field verification and report generation, and one week for review. The proposed schedule is enclosed for your reference.

2. Identification of Researcher/Line Representatives - Individuals for the each Laboratory Division were identified for involvement in the work/hazards identification process. Input was desired from this community to be able to assist/act as a liaison in the field verification activity, as well as provide a point-of-contact for division review of the summary report.

The list of identified division representatives, along with EH&S Team Leaders is noted below:

Division Research/Line Participant(s) EH&S Team Leader

Life Sciences Scott Taylor Dave Tudor

Physics Ron Madaras Paul Davis

Engineering Sandy Goss, Don Rondeau Paul Davis

Structural Biology Jim Bartholomew Paul Blodgett

Earth Sciences Peter Persoff Paul Blodgett

Chemical Sciences Norman Edelstein Dave Tudor

Material Sciences Mark Alper Bruce King

Energy & Environment Bill Carroll Bruce King

Nuclear Sciences Janis Dairiki Roger Kloepping

Accelerator & Fusion Rod Keller Keith Gershon

Research

Facilities John Bowerman, Don Webber Rob Connelly

Division Research/Line Participant(s) EH&S Team Leader

Computing Sciences Dave Stevens Paul Johnson

Operations Karl Olson Paul Davis

Environment, Health Jack Bartley David Balgobin

& Safety

3. Lawrence Livermore (LLNL) Assistance - Three Hazards Control professionals from LLNL have been chosen to be involved with the work/hazards identification process. The designees were selected based upon technical expertise: Richard Kelly (Industrial Hygiene); Michelle Sundsmo (Health Physics/Radiation Protection); Steve McConnell (Safety Engineer); there was also an additional request for a Fire Protection Engineer.

These identified individuals will be expected to provide technical input to the process by serving on work/hazards identification teams representing technical area of expertise, and by membership on Laboratory Safety Necessary and Sufficient Standards Identification Team. All staff from LLNL currently identified to provide support, as well as any individuals selected in the future, are to work collaboratively with LBNL technical lead counterparts and appropriate Team Leaders to apportion time.

4. Work/Hazards Identification Process Review - All in attendance were lead through the revised "Work Definition & Hazard Flow Diagram" (enclosed) in order to provide further clarification on the process. It was identified that key points for the Team Leaders to consider at present was collection of appropriate ES&H information; this includes prompting division representatives to gather documents that are kept locally (e.g., self-assessment information, notebooks). It was determined that divisions would be in the best position, and should be encouraged, to obtain "key plan" diagrams and organize spaces based on functionality. Furthermore, Team Leaders must make decisions as to whom is on their teams.

Team Leaders will also be instrumental in the development of division summary reports; a template will be made available to assist with this task.

SUMMARY/ACTIONS:

- Team Leaders to work with Sharon Buckley to begin to collect appropriate documentation for division reviews.
- Team Leaders to provide listing of selected team members to Jack Salazar
- Team Leaders will notify Jack Salazar of any hardships/request for change in proposed schedule

- Jack Bartley will work to ensure research/line participants from each division are notified
- Jack Salazar/Jack Bartley will coordinate on developing a template for use by Team Leaders in division summary report generation
- Jack Salazar will pursue adding "drop-down" menus to the Risk Survey Worksheet
- Jack Bartley will continue to interface with LLNL to arrange for adequate transfer of professional staff in support of this process

J. Salazar

6/12/96

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING
Minutes for meeting of June 12, 1996

Present:
LBNL: B. Feinberg, D. McGraw, J. Bartley; **DOE/OAK:** _____; **DOE/BSO:** P. Roebuck; **UCOP:** K. Groves; **DOE/HQ:** ____ ; **FNL:** L. Coulson; **LLNL:** J. Johnson (telecon)

• CHARTER

The revised draft Charter was reviewed: New sections on Objectives, Internal Review Teams and Review of the Standards Set were approved. There was a decision to add the DOE perspective to the Resource Authorities section, to clarify the standards set approval process, and to add to the section on Stakeholders. Further edits will document the discussion of the draft, and will be reviewed at the next meeting.

Team Membership: Additional team members will be added when final team selection is complete. It was announced that the DSC is anticipating a successful N&S product from LBNL and is reducing its advisory staff to this Lab. David Short will continue to provide DSC advisement to LBNL, however Dennis Parczyck is being reassigned to advise other labs.

Costs: N&S expenses will be tracked by the Process Leader.

ACTION - Convened Group members are to track the number of hours by week that they and each of their staff members are spending on N&S activities. Cynthia Tilden will send a weekly email request to CG members for this data (by person) and for any other N&S expenses.

• CONFIRMATION TEAM

There was a discussion of assuring a well-rounded representation of institutions on the team. The NTLF Confirmation Team provided a starting point for discussion. It was agreed to add breadth to the involvement from large technological corporations, academic institutions, bio-tech companies, and DOE programs. Suggestions included adding high level SMEs from EM, OHER, HENR, branches of the CA State Dept. of Health Services and NIH, possibly Chiron or another bio-tech company, UCSF, SLAC, HP, Intel, and Dupont. Edits will be provided for next meeting's review. Jack Bartley will add detail to the Charter section based on the discussion.

• STAKEHOLDERS

The NTLF Stakeholder list was reviewed, and there was discussion to develop a well rounded representation of those who regulate us and are materially affected by Lab work. It was suggested that Berkeley Chamber of Commerce be added. Edits will be provided for next meeting's review.

• OTHER ITEMS

Selection Letter: There was agreement on the content of the letter from Director Shank and Dr. Turner recruiting the N&S team members. Ben Feinberg and Phil Roebuck will finalize the letter.

IFA Team: Jack Bartley gave a brief update on the status of the IFA Team and the schedule was discussed. It was agreed that Phil Roebuck will coordinate DOE involvement with the IFA Team as needed to assure agreement on the IFA plan.

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING
Minutes for meeting of June 19, 1996

Present:
LBNL: J. Bartley; P. Williams; **DOE/OAK:** R. Kong; **DOE/BSO:** P. Roebuck; **UCOP:** H. Hatayama, K. Groves; **DOE/HQ: ER** Ray Schwartz, Mike Kinney (consultant); **EH** Dennis Parczyck; **LLNL:** J. Johnson (telecon)

IFA TEAM STATUS REPORT

Jack Bartley led a discussion of the IFA schedule, the preliminary and final report dates, and when the ID Teams can start. Three IFA teams start today and three next week. Jack asked for comments on the schedule before the next meeting (handout). Phil Roebuck received a copy of the IFA Team checklist and the protocol to coordinate DOE input.

• CONTRACT MODIFICATION

Article XV Clause 3 of Contract 98 was discussed. Ben Feinberg's mark-up was reviewed. Phil Roebuck relayed DOE/OAK Council's comments that this article was written in the old compliance environment. There was brief discussion of when the contract should be modified since we are negotiating a new contract, and of the possible disconnects among the many offices.

ACTION - Ken Groves will check with the DOE/OAK Contracting Officer to assure N&S is incorporated into contract and report back to the group.

• CHARTER

The revised draft Charter was reviewed and approved and a few names were added to the ID Teams. It was agreed that the Charter is a living document and will be updated as needed.

• ID TEAM

The completeness of expertise on each team was discussed. It was agreed that the breadth of knowledge needs to correspond to the work, hazards and standards under review. Jack Bartley and Phil Roebuck will meet to go over the team composition and what LLNL people will be added to the teams.

Phil Roebuck announced DOE's approval of the LBNL Team Members currently listed in the Charter based on the credentials that have been reviewed in DOE. Jack Bartley will firm up the LBNL researchers for team membership approval.

The revised Charge to the ID Teams presented by Phil Roebuck will be reviewed and discussed at the next meeting.

ACTION - DOE/OAK to confirm EM member

ACTION - Jack Bartley and Phil Roebuck to identify the LBNL researchers and LLNL members.

ACTION - CG members to send comments on Charge to Ben Feinberg

• CONFIRMATION TEAM

The current draft list was reviewed and discussed. There was a discussion of the information package that should be presented to the team members. It was agreed that they should be given a schedule and an idea of their commitment. The idea of preparing videos of unusual LBNL work sites to assist the Confirmation Team was discussed.

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of June 26, 1996

Present:
LBNL: B. Feinberg, K. Berkner, D. McGraw, J. Bartley, P. Williams; **DOE/BSO:** D. Nolan, P. Roebuck; **DOE/HQ:** DeVaughn Nelson (telecon); **Fermi:** L. Coulson (telecon)

Contract Modification

There was discussion on how to best get the revised contract language ready for signature at the end of the N&S project. It was agreed that a group of contract specialists (representing UC and DOE) should be formed to review the current contract language and the Fermi contract and report back to the group with proposed language for LBNL. Dick Nolan agreed to get the preparation started so the group could meet the week of 7/8/96.

ACTION: Dick Nolan to arrange with Rona Promani and Ron Nelson to develop draft contract language and a timeline for proceeding to be reviewed at the next meeting.

Stakeholders

The group discussed the universe of stakeholders needed to assure useful representation in the process and agreed to target those environmental groups with a history of integrity in past dealings with the Lab. It was decided the City Environmental Action Commission (CEAC) which represents members of local environmental groups, its Oakland equivalent, and the Planning Commission be asked to assure this representation Ben Feinberg reported on his discussion with the public and governmental relations representatives, and the group agreed with the recommendations that the proposed list was complete.

ACTION: Dave McGraw to draft a letter to the Stakeholders, and a modified letter to the Planning Commission, CEAC, and its Oakland equivalent, for the group to review at the next meeting.

Schedule and Status of IFA Process

Jack Bartley reported that the hazard inventory checklist was developed back in April and May with DOE participation, and continues to be modified as needed. It is anticipated that it will be further modified during the IFA process. Phil Roebuck reported on a DOE/BSO meeting last week with Jack Bartley and Jack Salazar on this subject, stating general satisfaction was reached, and noted DOE/OAK is requesting more information. He agreed to work with OAK and to be the conduit for specific DOE comments that are not addressed in the IFA Teams. It was agreed the weekly IFA meetings would be the forum for discussion of these comments, and that comments may be submitted by anyone (not just DOE). The CG will review the current checklist at the next meeting.

The concern to get the appropriate DOE subject-matter-expert representation on the teams was discussed. Jack explained the schedule was set up to maximize SMEs availability and noted the ES&H IFA Team Leader is developing a matrix that will show DOE team members who to contact in each area of hazard. Phil expressed concern that the right information be collected and delivered to the right people. The group decided to review a draft IFA report for the ID Team at the 7/8/96 meeting, and to check it satisfies Process Step #1.

Confirmation Team

The group discussed how to acquaint Confirmation Team members with particular site-specific work areas. Providing currently available videos and accepting requests for tours were both approved as reasonable options. It was decided a letter to the team members with a plan of their activities needs to be developed. The Confirmation Team should receive the set of standards around 9/2/96 along with sufficient materials or tours as needed, and should plan on a conference call and a 1-day meeting at the Lab. The letter should be approved at the next meeting, and be sent out the same week.

ACTION: Ben Feinberg to draft a letter and plan for the Confirmation Team

Other Items

The letter to the ID Team members needs to be redone to reflect the new name for this process - "Work Smart Standards". It will then be resent to Director Shank and Dr. Turner for signature. It was agreed the letter should be sent out this week.

Changes to the Charter were discussed. The charge from the Convened Group to the ID Team will remain an appendix, and the definition of consensus will be added to the charter section 3.9. The specification that anyone may submit comments on the hazard identification process should also be added to the Charter.

ACTION: Ben Feinberg to provide changed wording for next week's review.

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of July 3, 1996

Present:
LBNL: B. Feinberg, D. McGraw, J. Bartley; **UC:** H. Hatayama; **DOE/BSO:** D. Nolan, P. Roebuck; **DOE/OAK:** C. Simkins, P. Hill (telecon); **DOE/HQ:** DeVaughn Nelson (telecon); **Fermi:** L. Coulson (telecon) **LLNL:** J. Sims, J. Johnson (telecon)

EM Approval

The group discussed the need to assure EM will approve our efforts at the end of the project. Phil Hill told the group there is a verbal commitment, and he is still working on getting a letter from EM. The wording of the letter has been verbally approved by EM. Phil will continue to push to get the EM letter, and Charlie Simkins will assist as needed.

Outreach

Ben Feinberg gave a presentation on the Work Smart Standards Project to the Energy & Environment Division last Friday. He reported the group was very enthusiastic, wants to be involved in the project and is committed to the outcome. The IFA Team has been briefed on the IFA portion of the database and the current status of the project. Jack reported the group is enthusiastic. He is meeting with Paul Blodgett to finalize the SBD report which will be reviewed at next week's CG meeting. Dave McGraw will be briefing the Lab Safety Group today.

Charlie Simkins suggested LBNL give a presentation at the next DSC meeting in Washington, D.C., August 15 & 16. Tara O'Toole will be visiting Berkeley Lab 7/30/96 and 8/1/96. The group decided to arrange the first Stakeholders meeting to allow her to attend, and to provide a presentation on the project for her.

IFA Process: Status and Schedule

Jack Bartley reported on the current checklist. DOE comments were provided on Monday by Phil Roebuck, and Bruce King and Matt Kotowski of the IFA teams also provided suggestions. The checklist is being revised to incorporate these comments.

Jack also reported on the IFA data management which is designed to allow for massive amounts of collected data to result in a single report with tracks back to the details as needed. An example is the SBD data which has been collected room by room - the data is folded up into a report for each of four floors in the building. The database then sorts the data by hazard type and distributes the information for the five Identification Teams to provide most of the focus of their work. It is anticipated that each division will generate 30 reports on the average.

There were no changes to the overall N&S schedule; Jack reported the IFA is on schedule and discussions in LSD are beginning.

Contract Modification

Dick Nolan reported on his talks with Rona Promani, Ron Nelson and Sandy Vinson. A letter agreement is the most likely type of contract instrument to be used at the time of the standards set agreement. Rona will be meeting with UC and may attend next week's CG meeting to report on the status.

Stakeholders

There was a review of the draft letter to the Stakeholders, and discussion on when to hold the first meeting. It was agreed to arrange the meeting for 7/31/96, 6:30 PM, during Tara O'Toole's visit since the project will be in data-collection, and the lead time would allow Stakeholders to make arrangements to attend.

ACTION: Dave McGraw to finalize the letter to the Stakeholders, and draft a modified letter to the Planning Commission, CEAC, and its Oakland equivalent, for the group to review at the next meeting.

Confirmation Team

The group reviewed the draft letter and discussed the best institutional and individual representation to assure a peer review environment with broad overview. It was agreed a second letter would accompany the standard set and ask what tools they would need. Jack Sims provided input from the Fermi pilot, including alerting the team they will also be confirming that the process was followed. The group will finalize the list of invitees at the next meeting.

ACTION: Ben Feinberg to finalize the letter and plan for the Confirmation Team

Other Items

It was agreed that a letter to the ID Team members will be sent out to LBNL participants from Director Shank which references the new name for this process - "Work Smart Standards", and a letter from Dr. Turner will be sent out to DOE participants. This allows notice to the team members and their supervisors.

Changes to the Charter were discussed. Section 3.6 will be rewritten for clarity. The reasonable person test will be discussed at next week's meeting. There was a discussion of the Extended Convened Group, and agreement to add an explanation to the Charter.

ACTION: Ben Feinberg to provide changed wording for next week's review.

The group agreed the Work Smart Standards website would be used for production activities as well as for the final product. Passwords will be provided for an internal site to allow for report production, meeting minutes, and other draft documents to be posted for review. As documents are finalized, they will be added to the external site. Charlie Simkins suggested LBNL establish a Caucus Room on the DSC website.

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of July 10, 1996

Present:
LBNL: B. Feinberg, J. Bartley, K. Berkner, P. Williams; **UC:** H. Hatayama; **DOE/BSO:** D. Nolan, P. Roebuck; **DOE/OAK:** R. Kong (telecon) R. Promani (telecon); **DOE/HQ:** DeVaughn Nelson (telecon);

Contract Modification

Rona Promani discussed two options for the group to consider: 1) a Contracting Officer (C. O.) directive put into Appendix G which would list the set of standards to replace the existing ES&H directives in the contract. 2) insert the proposed ES&H clause language in the prime contract along with the standard set. The group discussed the pros and cons of each. Option one would be the most expedient approach and would not need Regents' approval, however the current prime contract language does not appear to support the N&S outcome and this could be problematic if personnel changed. Option two or any change to the existing prime contract would take more time and effort to go through the Regents' approval process. The group decided on option one when the standard set is approved, and consideration of option two at that time if the finalized ES&H clause is good and there will be a year befor the new contract takes effect. The group will review the C. O. directive for the NTLF at the next meeting.

Outreach

Ben Feinberg has been invited to give a presentation at the next DSC meeting in Washington, D.C., August 15 & 16. During Tara O'Toole's Berkeley Lab visit, a presentation of the ALS, the Human Genome Center, and the NTLF will be arranged by the ID team leaders. Director Shank met yesteday with 60 of the Lab's top researchers with an endorsement of the N&S initiative at Berkeley Lab. Ben will give a presentation at the next Safety Review Committee meeting.

Howard Hatayama will propose involving the IFA process and N&S as the backbone for the joint DOE/UC ES&H rescoping work at tomorrow's DOE/UC meeting. There were related comments that the DOE appraisal of the ES&H Appendix F performance should reflect N&S.

IFA Process: Status and Schedule

The SBD, MSD and the preliminary LSD reports are not yet available, but Jack Bartley has reviewed them and reported they look good. The EH&S report is in initial stages and is coming along well. Jack noted all teams are following all the steps in the IFA process, but changing the order of the steps or adding steps as needed to assure a complete inventory. EH&S is doing additional walkthroughs due to the diversity of the activities and to accomodate new hazard discoveries. 80 researchers in Physics filled out descriptions of their work and a hazard checklist as an aid for the IFA team to validate. Phil Roebuck, on the MSD Team, reported that the process is efficient and valid and noted his team well represents the subject matter expertise needed.
There were no changes to the overall N&S schedule; Jack reported the IFA is on schedule and discussions in LSD are beginning.

Contract Modification

Dick Nolan reported on his talks with Rona Promani, Ron Nelson and Sandy Vinson. A letter agreement is the most likely type of contract instrument to be used at the time of the standards set agreement. Rona will be meeting with UC and may attend next week's CG meeting to report on the status.

Stakeholders

Dick Nolan reported that the letters to the Stakeholders have gone out and the modified letter to the Planning Commission, CEAC, and its Oakland equivalent should go out today.

ACTION: Jack Bartley to review the list of Stakeholders.

Confirmation Team

The group decided the Confirmation Team should first be contacted by phone then receive a short letter with an attachment. Phil Roebuck has contacted the DOE participants. Phil Williams shared the NTLF experiences. It was agreed a total of three letters may be needed during the project.

The list of team members was reviewed, and it was identified that construction expertise should be added. Next week the group will address the breadth of subject matter expertise needed on the team and review the team list to assure there are no gaps.

ACTION: Ben Feinberg to finalize the letter and plan for the Confirmation Team, and provide a crosswalk of subject area coverage by the team.

IFA Team Leaders Meeting

7/11/96

Noon - 1:00

Attendees: D. Balgobin, J. Bartley, P. Blodgett, S. Buckley, H. Carwell, J. Chwang, R. Connelly, P. Davis, K. Gershon, P. Johnson, R. Kloepping, L. Marik, P. Roebuck, J. Salazar

Structural Biology Draft Report

* Blodgett distributed copies of the Draft Report for the Structural Biology Division IFA for general review and discussion. Review of each of the 8 necessary elements (see below) comprising this report for use by the N&S identification teams is presented below:

1) Organizational management - this information comes from existing documentation (e.g., organization charts) from the division; any particularly notable ES&H information (e.g., active safety committee description and composition) can also be included here.

2) Text from Structural Biology should be used as the boiler plate for all divisions - this information should be global for LBNL, and changes, if required, must be applied consistently.

3) Should be concise and short, based on division and/or sub-group mission statements.

4) Should be a brief description that provides a general characterization of the locations and types of work areas that provide an insight into the work performed; the existence of Appendix J campus work locations should be brought up in this context

5) The PHA Worksheet information should be used as a basis to describe the scope of the hazards noted in a particular division; items of higher relative concern and those unique hazards mentioned on the worksheets that require additional clarification should be expanded upon here. This section can be organized by location, as well as by N&S standards area (i.e., environment , facilities, lab, core, and accelerator).

6) List of any uncertainties noted in the "Significant modifications..." box (first item, last page on PHA Worksheet) or in general discussions with division representatives. An example would be a proposed new facility/operation associated with the division (e.g., SBD research area slated for B80 in conjunction worth the ALS).

7) Resource availability and strengths based on answers by division representatives to standardized questions

8) Stakeholders concerns should include site-wide and individual division concerns.

* Feedback on the report:

- Roebuck wanted to ensure that the Core Team and the Convened Group would have the opportunity to review the report.

- Bartley stated that IFA Team Members need to be listed on the report and that the dates for each of the steps taken for the IFA be noted on the cover page (e.g., teams meeting dates, table top review, etc.)

- Carwell clarified that any deviation from the Protocol must be run by Bartley and Salazar in order to keep the integrity of the process. All deviations must be noted as well.

- Team leaders and mebers need to keep in mind to note instances where researchers indicate standards/policies that have histiorically generated significant compliance issues or taken extensive effort or energy to address.

Team Updates:

* Physics: Field validation meeting to take place 7/12

* ENG: Initial Hazard Review held 1:30 7/11. ENG broken into 12 groups for hazard analysis.

* EHS: Interviewed environmental monitor field tech. Consolidated worksheets into functional groups. Confirmatory table top to be conducted week ending 7/19.

* Comp. Sci.: On 6/30 Davis/Johnson met with ESH Committee to review process. 1st official meeting to be held week ending 7/19. Johnson to send message to Stephanie Taylor of kick-off - she will be the DOE counterpart for Computer Sciences.

* MSD (update by P. Roebuck): followed system closely, only NCEM must still undergo field validation; all else completed. Walkthrough was interesting because the worksheets were already filled in, predominantly a QA exercise. The summary report draft is expected late in the week of 7/19 or early the following week.

* LSD (update given by J. Bartley): B55/56 field validation to be done 7/12. Scott Taylor took the lead on he Hazard Analysis for 55/56. Looks like some of the researchers want to be involved contrary to original belief.

* NSD: Moving along.

General feedback on the IFA process has been positive. IFA seems to be effective and well received.

LBNL Necessary & Sufficient Initiative Process

Core Team Meeting

Minutes for meeting of July 15, 1996

Present:

LBNL: J. Bartley, B. Feinberg, J. Chung, R. Pauer, N. Shepard, B. Schleifer, D. Tudor, P. Williams;
LLNL: J. Johnson;
DOE/BSO: C. Chang, T. Goldman, P. Roebuck, C. Schwab;
DOE/OAK: J. Chwang

N&S Overview

All Core Team members have taken the DSC N&S Training. Jack Bartley gave a presentation detailing the N&S Closure Process and identifying the iterations between steps 3 and 8. The DSC's role as a high level committee to integrate the DOE initiatives, including N&S, was discussed. The goal of tailoring the requirements to the work at the Lab and implementing them at the lowest hazard mitigation level was discussed.

Standards Identification Process at LBNL

The Core Team is to provide a direct line of communication between the ID Team and the Convened Group with regard to issues, and is to coordinate the sub-team reports, such as removing standards redundancies and removing standards that are not designed for conditions at LBNL.

The composition of the five Identification Teams was discussed. Phil Roebuck noted DOE is represented on each team, and each major Lab division has representation on one of the teams. Researchers are represented on all teams.

LBNL has added a validation step to the N&S Closure Process.

Development of ID Team Form

The ID Team form will be developed by the Convened Group. The Core Team is to review the forms provided at the meeting and be prepared to develop suggestions on the form at the next meeting.

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of July 17, 1996

Present:

LBNL: B. Feinberg, J. Bartley, D. McGraw, P. Williams; **UC:** K. Groves; **DOE/BSO:** D. Nolan, P. Roebuck; **DOE/HQ:** DeVaughn Nelson (telecon); **LLNL:** M. Cornell (telecon), J. Sims (telecon); **Fermi:** L. Coulson (telecon)

Schedule

There was a discussion of the overall N&S schedule, and agreement that we are on track. Ben Feinberg presented a table of milestones for review and noted that it is a rigorous schedule. Jack Bartley reported that the MSD and SBD reports are proceeding ahead of schedule. Phil Roebuck noted the IFA process allows front-loading the standards information into the work and hazards analysis so the schedule is realistic.

Tara O'Toole's Visit

Dave McGraw gave a report on the plans for her visit to Berkeley Lab. Her tour will include a focus on the site-wide use of the learning from the NTLF N&S Pilot project, showing how the challenges are being addressed across divisions and with mixed waste and other hazards. Her visit is scheduled for 8/8/96.

IFA Status and ID Team Interface

Jack Bartley's methodology for incorporating the standards identification into the hazard analysis was discussed. Jack has explained this methodology to the Core Team. Next week the group will review the forms and guidance documents being developed for the ID Teams. Jack Simms emphasized there should be a clear link between the work, hazards and standards in the final document. It was agreed the Core Team should get from the IFA Team division lists of safety issues with comments.

Core Team

The group discussed the start of the ID Teams, and agreed that the Core Team should assure each subteam appoints someone to take minutes of subteam meetings.

Confirmation Team

The group reviewed the team composition to fully cover the needed hazard-area expertise, and to assure the organization types were represented. It was agreed to remove the regulatory agencies from the Confirmation Team since it could pose a conflict of interest, but to keep them on the Stakeholder Team. It was further decided to add DOE on environmental hazards and to get expertise from universities on mixed waste since it is important the Confirmation Team is familiar with the work. Ben Feinberg will update the list and will rewrite the letter and plan for approval next week.

MEETING MINUTES
July 18, 1996
Facilities Team Planning Meeting

ATTENDEES:

Carl Schwab, Steve McConnell, Judy Kody, Stan Terisaki, Collin Jones, Fred Lothrop, Tony Yuen, James Chwang, Ginny Lackner, Rich Haddock, Rob Connelly

DISCUSSION ITEMS:

1. Intro of team members.

2. Overview of IFA process: IFA Team Leader explained the IFA process by handing out and going over the "Work Definition and Hazard Identification Flow Diagram" and the "Draft Work and Hazard ID Schedule".

The objective, process, and scheduling for Preliminary Hazard Assessment (PHA) and field verification were both discussed by the Team Leader.

3. Discussion of responsibilities: Responsibilities section (Page 3) of the IFA Draft Protocol was handed out and the Team Leader reviewed with the team.

4. Distribution and explanation of hazard documentation and worksheets: Team Leader handed out and discussed the documentation that will be used at the next IFA meeting for the desk top hazard identification. IFA worksheets ("Safety Engineering Folder" worksheet and the "PHA" worksheet) were reviewed and discussed. It was decided the team would use both worksheets until the combined worksheet was developed for our use.

5. Fred Lothrop expressed concern about the lack of notification for the IFA process. Although Fred missed the initial lab wide meeting for Division Safety Coordinators, etc., he indicated it would have still been helpful to have better notification.

6. Tony Yuen and James Chwang raised the issue of Facilities hazards in site wide buildings (i.e., boilers, pumps, etc.) and assigning consistent Division ownership throughout the IFA process. It was agreed that Facilities would probably have ownership for these areas, but we would wait until the team leaders meeting to confirm.

7. Fred Lothrop explained the Facilities Organization Chart to the team. Since the Facilities space database was not available for this meeting, it was agreed that the Team Leader and Fred Lothrop would meet prior to the Preliminary Hazards Assessment (PHA) meeting to identify Facilities occupied spaces.

8. Team members were assigned to reveiw the hazard documentation to become familiar with the hazards and to initially fill in the worksheets based on this documentation in preparation for the desk top review.

9. Team member vacation and work schedules were discussed and noted.

Please find enclosed a copy of the 7/11 meeting minutes distributed at

yesterday's meeting.

Summary of the Process by which Adequate Team Membership is Established

1. The team leader will perform a cursory review of the available hazard information set. The ES&H Division Coordinator and Division Liaison will participate as appropriate. The team leader will then identify, based on hazard information set and process knowledge, pertinent ES&H functional areas pertaining to the division. The team leader will then generate an e-mail addressed to DOE (P. Roebuck and H. Carwell) and cc Bartley and Salazar that will identify these ES&H functional areas along with a brief description, in the context of the work activities and potential hazards, of the criteria used to identify functional areas.

2. DOE will then identify suitable candidates, as necessary, to participate in the IFA process for the division. The team leader will designate EH&S technical staff to complete the team. The team will then work collaboratively to ensure that adequate representation, based on the functional areas identified, is provided by EITHER EH&S or DOE-OAK personnel.

3. The initially identified DOE/EH&S joint IFA team will then convene to conduct an initial hazards identification ("table-top documentation review") that will contain a brief orientation segment. Following this initial hazards identification session, adjustments to the team membership can be made as a more accurate picture of the work/hazard character of the division emerges.

4. The field validation phase covering selected areas can then proceed with the adjusted team, and further adjustments to the team participants can be considered based on a correlation of prominent ES&H functional areas within spaces to technical specialists.

Please let me know if you have any questions or this or need further clarification.

LBNL Necessary & Sufficient Initiative Process
Core Team Meeting

Minutes for meeting of July 23, 1996

Present:
LBNL: J. Bartley, J. Chung, B. Feinberg, A. Jackson, B. King, M. Schoonover, B. Schleifer, D. Tudor;
DOE/BSO: T. Goldman, J. Lorence, P. Roebuck, V. Ruggeberg;
DOE/OAK: J. Chwang, C. Schwab

Schedule

Ben Feinberg reviewed the N&S schedule, emphasizing there is no slack time. The Sub Teams will begin soon, and should plan on a lot of work especially during the week of 9/2/96 (Labor Day week). Jack Bartley suggested and it was agreed that there be a 1-day Core Team meeting on 9/3/96 to review and finalize the draft Standard Set (from the IFA team) before sending it to the Convened Group by the end of that week.

N&S Overview

Jack and Ben presented updates to the DOE N&S initiative. The DSC has three teams ("SPATs") developing guidelines for the N&S documentation, risk assessment, and matching standards according to the level of hazard ("tailoring"). A Focus Group is overseeing the output of these three teams. Dave McGraw has been requested by Maggie Sturdivant to present the LBNL N&S process to the Focus Group.

Standards Identification Process at LBNL

Jack gave a presentation that included the details of each of the steps of defining the work and associated hazards and identifying the standards, and what tools will be available to the teams (handout). The details of identifying materials and conditions that could cause adverse consequences, and areas that will need to be judged such as uncertainties in the work were discussed. Jack described the IFA materials including the hazards lists the teams will use. The researcher questionnaire is being developed with the researchers and will be included in the teams materials. Standards should be picked based on mitigation of the highest risk. Later, in the implementation phase, applying the standard appropriately to the actual hazard will be addressed.

ACTION: Team Leaders to convene sub-teams and report status to the Core Team weekly

Development of ID Team Form

The team discussed what fields to include on the ID Team form. It was explained that the form is a portion of a database that provides a connection from the hazard back to the IFA source as needed. The form will allow for exemptions to be identified, and non-value added aspects of legal requirements to be identified for use in the implementation phase. Jack will develop the form based on the discussion and present it to the Convened Group for approval and dessemination.

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of July 24, 1996

Present:

LBNL: B. Feinberg, J. Bartley; **UC:** H. Hatayama; **DOE/BSO:** P. Roebuck; **DOE/OAK:** C. Simkins (telecon); **LLNL:** M. Cornell (telecon)

Stakeholders Meeting

There was a detailed discussion of the first meeting to be held 7/31/96.

Maggie Sturdivant from Tara O'Toole's office and James Henderson from Barbara Boxer's office plan to attend. It was suggested that Dave McGraw arrange a Lab tour for Maggie similar to the tour being planned for Tara O'Toole in August.

There was further discussion of the likely attendees and Phil Roebuck raised a concern about the Berkeley and Oakland city councils' citizen environmental advisory groups as a means of Lab outreach to the local community environmental groups. Jack elaborated on the advisory role to city government as an established conduit to the community environmental concerns. For Berkeley, the memberships cover each city district and each member is a liaison to an environmental group. Each member was sent a letter about the meeting. It was agreed that a second letter would go out to all attendees on Monday to remind them and provide directions to the meeting. Howard Hatayama suggested the members also be called. It was also agreed that attendees and non-attendees alike receive follow-up information from the meeting.

The agenda will include a presentation by Ben Feinberg to explain the process, the stakeholders' role, and why we're doing N&S. Charlie Simkins noted that DOE established the N&S process due to criticism of a number of external groups of high credibility including presidential commissions mandated by Congress that requested Labs be sure the right standards are being applied. LBNL's unique setting as a lab in an urban area was discussed as a reason why we're taking special care in this process.

ACTION: Jack Bartley to send a second letter to the Stakeholders on or before Monday

ACTION: Ben to work with Public Information Department to do a dry-run, arrange for assistance and decide on other presenters.

IFA and ID Team Status

Jack Bartley reported the IFA Teams are on schedule and the report looks good. The Core Team is now established and will track the ID Team progress and report to the Convened Group. Ben reported the Accelerator & Fixed Radiation Team has plans to begin by reviewing the two major LBNL hazards documents and check the FNL and CBAF standards sets.

The ID Team form was reviewed and approved by the group. It is complete and logically arranged. Jack designed it as a database layout form so it can interface with the IFA Team output and allows for direct data entry by the team members. A LBNL N&S flowchart for this form was reviewed and approved by the group. It will be included in the ID Sub-Team orientation packages

The Charge to the ID Team from the Convened Group was approved and will be presented to the teams at their first meeting.

Confirmation Team

The group reviewed the revised team/hazard composition list in detail and approved the letter and plan to be sent to the Confirmation Team with minor changes. The team composition is shaping up, and redundancies of expertise were eliminated. It was agreed to keep CA State Dept. of Health Services on the team even though they are a regulating agency since their expertise will be used in NRC standards for accelerator and fixed radiation source hazards.

Internal Review Teams

Phil Roebuck prepared a letter to the DOE ES&H Policy Committee explaining the overall WSS purpose and process and what is expected of the committee. The group reviewed and approved it. A similar letter will be sent to the Lab Safety Review Committee.

Researcher Input to N&S

Another article in Currents is being planned to update those Lab researchers who are not directly involved in the process. Ben will work with Public Information Department in the next week to develop the article. Jack Bartley reported on the response from a couple of the 14 research groups he has contacted. The main difficulty they have with the current standards is unclear guidance.

Other Items

There was a brief review of the NTLF Letter Agreement. The group agreed to follow it as a model for the contract modification.

The Charter changes were reviewed and approved.

MEETING MINUTES
July 25, 1996 &
Team Leaders Meeting For IFA/N&S

AGENDA

1. Process Review

2. Hazard Linkage to N&S ID Teams

3. Core/Convened Group Update (as necessary)

4. IFA Team Updates

5. Other Items/Open Forum

DISCUSSION ITEMS:

Based on last week's meeting (7/18), a consensus on the following issues was reached:

1. Team Composition - A reiteration of the process by which initial IFA team planning and constitution was deemed necessary, and was conducted during the meeting. Two points of note emerged during this discussion: (1) that the initial orientation or planning piece for the team could take place at the same time as the desk-top review, and (2) membership of the team would be a complimentary confluence of LBNL-EH&S and DOE-OAK resources; redundant coverage from both factions should not be a routine practice. A detailed summary on this topic was provided in a separate e-mail (7/19).

2. Building related equipment (e.g., electrical transformers) are to be covered under the Facilities IFA and not in conjunction with proximal research division, unless the equipment in question is intricately involved in an operation pertaining to the research division.

3. Highly toxic/toxic hazardous materials distinction - these categories on the checklist were based on UBC/UFC designations, and the LBL generated extremely hazardous report contains the same level of information.

4. Unattended operations - focus should be placed on intermittent, research operations of this nature; facilities type equipment (e.g., boilers), due to more formalized maintenance and testing schedules, do not necessarily require specific mention here.

5. Level of Concern - subject matter experts are to use judgment in determining the LOC ratings for individual hazards. The rating is a combination of the consideration of probability and consequence factors, within the context, and calibrated in relative terms, to conditions that exist on the LBNL site only.

6. Natural Phenomenon - Issues in this area (i.e., seismic issues related to trailers and other structures) should be covered in the context of Facilities, as opposed to items/equipment related to research operations vulnerable to this type of exposure.

7. Contractors - Contract work related to Facilities projects should be captured through Facilities.

Please find to follow a brief summary of what transpired at the 7/25 team

leaders' meeting:

1. Process Review (Team Composition and Planning) - It was reinforced that those individuals from DOE and LBNL-EH&S designated by the Team Leader as team members must participate to the full extent of his/her capabilities; persons wishing to drop in and observe the process without a defined role should not be a routine occurrence. In addition, it was agreed that each IFA team must include an Environmental Protection (EP) technical specialist from LBNL-EH&S, due to the relative unfamiliarity of sitewide concerns in this area by DOE counterparts. Finally, it was emphasized that IFA team leaders be informed of any changes/additions in DOE or LBNL-EH&S participants prior to the commencement of any planned team activities.

2. Hazard Linkage to N&S ID Teams - The output necessary for the five functional/subject-based standards ID teams (lab, accelerator, facilities, environment, core) will be derived from the IHA Worksheets as a result of the binning of "concerns or issues" (i.e., hazards, regulatory considerations) into the five ID team categories performed by the IFA teams. Each concern or issue will then be reviewed on an individual basis for identification of applicable standards and requirements. While it is expected that the process of translating concerns/issues from the IHA Worksheets for consideration by the ID teams will be automated, Team leaders may be expected to provide some additional analysis, particularly in regard to information provided in narrative form on the IHA Worksheets as well as specific information embedded within the IHA Worksheet categories, to ensure a full accounting of the concerns/issues.

Subject: **Meeting Record, Facilities & Infrastructure Team Necessary & Sufficient Site-Wide Process**

Date : July 26, 1996

Location: 90K Conference Room

Time: 2:30 pm

Present:
John Bowerman
James Chwang
Paul Davis
Ben Feinberg
Karl Olson
Phil Roebuck
Bert Schleifer
Pat Thorson

Absent:
Chester Chang (Phil Roebuck substituted)
Paul Johnson

Meeting Agenda:
Introductions
I D Team Purpose
N&S Schedule
Identification Team Document

Meeting was adjourned at 3:45pm.

cc:
Jack Bartley
Ben Feinberg

LBNL Necessary & Sufficient Initiative Process
Core Team Meeting

Minutes for meeting of July 30, 1996

Present:

LBNL:	J. Bartley, B. Feinberg, A. Jackson, B. King, R. Pauer, M. Schoonover, N. Shephard, D. Tudor, P. Williams
DOE/BSO:	C. Chang, T. Goldman, J. Lorence, P. Roebuck, V. Ruggeberg,
DOE/OAK:	C. Schwab

N&S Overview

Jack Bartley met with the database group and they are hopeful of having the database working with hazard(s) identification electronically by Thursday. The database will do a search and sort function to locate duplications, and will generate an identification form for those listed. If the form printout says high voltage, hopefully it will give the number of times high voltage occurs.

A listing of Acronyms was requested. Ben Feinberg suggested the listing be included as an amendment to the Charter.

Standards Identification Process at LBNL

The Team discussed starting the development of "Straw Sets" of Standards or a "Menu" of Standards.

Ben will provide Structural Biology Division report handouts to each team for review. Sample output documents filled out and sorted by teams will be provided as examples of how other people completed the forms. Teams should have four final hazard reports by Thursday.

Collapsing of the report sets from other Labs was suggested After discussion, it was decided that condensing might give teams a head start, but they might want to see all that other Labs have as trigger items.

Following questions on resources available for location of standards and ordinances, as well as other data, the group suggested using the Pub 3000, the N&S Home Page which can be found under What's New, and U.C. Engineering Department on campus to gather information. Also, Nancy Shephard has Berkeley, Oakland and Alameda ordinances and will make comments on these.

It was decided a "Menu" of Standards would be used, since it would allow teams to "pick and choose documents." Val and Phil will distribute first draft next week. TEID has agreed to provide editing services.

Federal OSHA and CAL-OSHA were discussed with the decision to follow the spirit and intent of Federal OSHA. The Lab is not subject to CAL-OSHA but it can be selected as a standard, not as law.

The Core Team will perform proactive duties to minimize the burden on sub teams. The Team will request suggestions and submit material to sub teams for agreement or disagreement.

Quick mail and Meeting Maker problems regarding meeting notifications were discussed.

ACTION:
1. Teams will review and clean up combined documents between 8/6 and 8/13/96.
2. Review of ID Team and Stakeholders.

Schedule

Sub Teams are meeting next week. By August 13th expect approved "Menu." The Core Team will meet again next week. The Core Team will review and finalize the draft Standard Set on 9/3/96.

FIELD VALIDATION 70/70A

The field validation for the Table Top Exercise that was conducted 7-31 will commence FRIDAY, 8-2-96. We will meet in the LOBBY OF BUILDING 70 (NW side). For anyone who is unable to attend, please let me know, in order to eliminate unnecessary waiting.

From review of the PHA sheets, the areas which we will focus on are Building 70, Rooms 116, 166, and 158 and Building 70A, Rooms 2275, 4419, and 4429. PHA sheets will be returned to each team member for verification during the walk-through.

MEETING MINUTES FROM 7-31-96

Table Top #1 in B75B Conference Room.

1. In attendance were; James Chwang, June Schwabe, Brian Smith, Ginny Lackner, Steve McConnell, Norm Goldstein, Henry Stauffer, Phil Roebuck, and Paul Blodgett.
2. A packet of information was distributed to each team member which included the schedule for ESD IHA/N&S exercise, the PHA flow diagram for hazard identification, and floor plans for ESD occupied space for Buildings 70, 70A, 90, and 90P.
3. Each team member received a set of PHA sheets divided by Building and floor space.
4. A brief orientation of the IHA/N&S process was presented.
5. A set of PHA worksheets were completed by each of technical specialists on the team, i.e., IH, Occ. Safety, Haz, Waste, Fire, ect. using the documentation gathered by EH&S and process knowledge.

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of July 31, 1996

Present:
LBNL: B. Feinberg, J. Bartley, K. Berkner, D. McGraw, P. Williams; **UC:** K. Groves; **DOE/BSO:** D. Nolan, P. Roebuck; **DOE/OAK:** R. Kong (telecon); **DOE/HQ:** M. Sturdivant; **LLNL:** J. Johnson (telecon); **ANL:** D. Parczyck; **FNL:** L. Coulson (telecon)

Stakeholders Meeting

Jack Bartley has contacted the community groups to remind them about tonight's meeting. Signs are being put up and maps will be available at the gate. Ben Feinberg reported on his meeting with the Public Info Department. The group reviewed the presentation, discussed its strengths and made comments on areas to stress. Maggie Sturdivant suggested an emphasis on the tailoring of the work, hazards and standards to assure consistency in the Lab practices, and to differentiate the application of standards for each of the UC Labs. Dennis Parczyck, Phil Williams and Larry Coulson provided lessons learned from N&S Pilots. It was agreed to include a copy of the SBD IFA report in the presentation.

The group discussed the stakeholders' involvement in the process and how to assure their comments are addressed by the Confirmation Team. Those not attending the meetings will be sent follow-up information. Dave McGraw and Phil Roebuck emphasized the Stakeholder comments will be a part of the permanent record. It was agreed to send the draft standard set to the stakeholders and to set up a reading room to allow access to the complete draft surevys of work and hazards.

ACTION: Dave McGraw to arrange for a Stakeholder Reading Room for Stakeholder access to the 8/19/96 draft surveys of work and hazards.

IFA and ID Team Status

IFA Teams: Jack reported the Physics report is finished, the MSD report is in final draft, the EH&S report is almost finished and he is pleased with the draft. Reports that have been started are ESD, E&E, AFRD and Engineering. Engineering has been divided into seven groups. LSD is progressing, and ICSD has a contingency plan in place due to a medical leave. A questionnaire has been added for the team leaders to go over with the researchers to elicit problematic standards. Ben added that a Currents article will be published Friday which will encourage researchers to provide input, and that an interactive form for researchers will be posted to the N&S website by Friday. The group worked on the wording for the web form.

Jack has worked with Ron Hall and Carole Casaretto to improve the IFA database and has been assured the detail will be retrievable at the end, and each workplace will be able pull up its standards. Klaus Berkner asked that these tables be downloadable into IRIS (Oracle) during the implementation phase. He also suggested Tara O'Toole be given a hands-on demonstration of the N&S database on her 8/8/96 tour of the LBNL N&S Project since it will be far enough along to show the direction we're going with it. Additional staff is being hired to handle the IFA work.

Core Team: Jack discussed how the hazards database is to generate the ID Team input. There will be a menu of requirements from FNL, SLAC, Jefferson Lab, NTLF Pilot, and state and local regulations to provide a starting point. The sets from the pilots have been gathered and Nancy Shepherd will add the state and local regulations. He emphasized the Core Team's role to look for

holes and redundancies in the standard sets from the sub-teams and noted this was developed from the NTS experience.

Sub-Teams: Ben reported all the ID sub-teams will have met by the end of this week. Two of the teams have already met. Team leaders are getting the completed FNL worksheets appropriate for their teams and a copy of the complete SBD IFA Report so they can get started.

Confirmation Team

The letter to the Confirmation Team will go out next week.

> **Action:** those assigned are to make phone contacts before the letter goes out.

Other Items

Ben has sent a display to DOE/HQ to be posted this week representing Berkeley Lab Work Smart Standards Project.

It was decided to publish another Currents article in a few weeks which will emphasize DOE's commitment to the project.

LBNL Necessary & Sufficient Initiative Process

Acc. & Fixed Sources I.D. Team

Minutes for meeting of August 1, 1996

Present:
LBNL: R. Connelly, B. Feinberg, K. Gershon, A. Jackson, R. Koeppling, P. McMahan;
DOE/BSO: J. Lorence;
DOE/OAK:

Ben Feinberg explained the process and schedules. He handed out the Structural Biology Division's Integrated Hazard Appraisal, and the Hazard Assessment Worksheets.

Alan Jackson handed out the Fermilab ID team Documentation, and a preliminary list of "hazards associated with accelerators" derived from the ALS and 88" AHDs. The list is to be augmented by team members. These hazards were then divided up between team members to identify standards that deal with the hazards. These will be discussed first with Alan on a one-on-one basis before next Thursdays meeting, when the selected standards set will be discussed with the whole team.

An initial list of "Fixed Radiation Sources" was identified as:

- Co 60 irradiator in blg. 74
- Cs calibration source in blg. 71
- X-ray sources all over the hill!
- Electron microscopes

We should enlist Ken Barat's help on standards for x-ray sources.
Roger Kloepping will look into standards for electron microscopes.

Next meeting planned for Thursday, August 8, at 10 AM in blg. 4 conference room.

FIELD VALIDATION 70/70A -- Completed 8-2-96

The field validation for Buildings 70 and 70A was completed for ESD. The following notes the agenda:

1. A walk-through of Building 70, Rooms 108, 116, 158, and 166, and Building 70A, Rooms 2275, 4419, 4421, and 4429 was conducted.
2. Team members verified/edited the PHA woksheets for 8 lab type areas.
3. The following researchers were interviewed about lab operations during the walk-through; Hoi-Ying Holman (70-166), Ray Gatti (70A-2275) and Mac Kennedy (70A-4419/4421).
4. The verification team consisted of; June Schuabe, Steve Mc Connell, Norm Goldstein, Lisa Snow, Peter Persoff, Ken Barat, Phil Roebuck, and Paul Blodgett.
5. 60% of the laboratory space or 25% of the total space that ESD occupies in B70 and B70A was validated.

LAST MEETING (Hopefully), MARK YOUR CALENDAR!!! MSD IHA SUMMARY REPORT REVIEW

Monday, August 5: 9:00-11:00 am B62-255

AGENDA:

Review team member comments that need discussion on the MSD IHA summary report and completed IHA worksheets.

PREPARATION NEEDED:

Bruce King will distribute copies of the MSD IHA draft summary report and completed IHA worksheets for all buildings to personnel on the "TO" list above. ALL TEAM MEMBERS NEED TO:

- Review the report and worksheets and make clearly-legible/typist-ready edits as needed.
- At the 8/5 meeting, any significant concerns that need group discussion should be presented and discussed. Technical edits that do not need discussion should be given to Bruce King in writing at or before the meeting.

Contact me if you are not planning on attending the meeting, or if you are uncertain as to the need for your presence.

COMPLETED MEETINGS & WORK:

MEETING COMPLETED MSD IFA HAZ ID & WALK-THRU: B72

Fri, July 19: 10:00-noon B72, lobby

AGENDA:

Review hazard ID worksheets for B72 that were piloted and completed in Dec 1996, update/check any additional information, conduct a check of information via area walk-through.

WORK COMPLETED:

Completed worksheets and walk thru for B72

ATTENDEES:

Russ Ellis, Doug Owen, Phil Roebuck, Steve Leeds, Tony Yuen, Bruce King.

MEETING COMPLETED 7/10 MSD IFA HAZ ID &

WALK-THRU: B2

Wed, July 10: 8:30-Noon B2-100B

AGENDA:

Conduct quality check of B2 hazard ID worksheet information via area walk-though of B2.

WORK COMPLETED:

Completed walk thru of B2.

ATTENDEES:

Russ Ellis, Jim Galvin, Ken Barat, Phil Roebuck, Harvey Grasso, Teh Sieh, Steve Black, Connie Grondona, Tony Yuen, Bruce King.

MEETING COMPLETED 7/10 MSD IFA WALK-THRU: B62

Wed, July 10: 1-4 B62-104A (R. Ellis' office)

AGENDA:

Conduct quality check of B62 worksheets and hazard ID via area walk-through.

WORK COMPLETED:

Completed walk-thru of B62.

ATTENDEES:

Russ Ellis, Phil Roebuck, Harvey Grasso, Connie Grondona, Bruce King.

MEETING COMPLETED 7/8 MSD IFA HAZ ID: B62, B66, and B2 (nonCXRO)

Mon, July 8: 8:30am - Noon, 1-3pm B62-255

AGENDA:

Complete "desktop" discussion, review, and identification of MSD hazards for B62, B66, and B2 (nonCXRO). Sustantially finish "desktop" completion of hazard assessment worksheets.

WORK COMPLETED:

Completed remaining 28 worksheets for B2, B62, and B66. Completed walk-thru of B66.

ATTENDEES:

Joel Ager, Russ Ellis, Jim Galvin, Matt Kotowski, Ken Barat, Phil Roebuck, James Chwang, Rick Kelly, Tony Yuen, Bruce King.

MEETING COMPLETED 7/2 MSD IFA HAZ ID, B62 & B66

July 2: 8:30am - Noon, 1-3pm B62-255

AGENDA:

Complete "desktop" discussion, review, and identification of MSD hazards for B62 and 66 (and other areas if the process goes fast). Sustantially finish "desktop" completion of hazard assessment worksheets for B62 and 66. Joel Ager and Russ Ellis from MSD will also participate. Joel will come at 9:30 am.

WORK COMPLETED:

Completed 14 worksheets for B62 & B66. 10 worksheets remain to be completed for B62 & 66.

ATTENDEES:

Joel Ager, Russ Ellis, Matt Kotowski, Ken Barat, Phil Roebuck, James Chwang, Harvey Grasso, Rick Kelly, Tony Yuen, Bruce King.

ESD IFA Team Meeting
8/6/96
11:56 AM

FIELD VALIDATION #2 - Buildings 14, 31, 51 -- Proposed

The field validation for the Table Top Exercise that was conducted 8-6 will commence FRIDAY, 8-9-96. We will meet in the Conference Room in Building 75B, and use the IH Van to move around the site. Please let me know if you are planning to attend; the van has capacity for 8 passengers. From review of the PHA sheets, the areas which we will focus on are Building 14, Rooms 118 and 137; Building 31, Rooms 100 and 103; and Building 51, Room 7. PHA sheets will be returned to each team member for verification during the walk-through.

MEETING MINUTES FROM 8-6-96

Table Top #2 in B75B Conference Room.

- In attendance were; June Schwabe, Brian Smith, Ginny Lackner, Steve McConnell, Norm Goldstein, Judy Kody, Phil Roebuck, Ken Barat, Rich Haddock, and Paul Blodgett.
- A packet of information was distributed to each team member which included floor plans for ESD occupied space for Buildings 14, 31, and 51.
- Each team member received a set of PHA sheets divided by Building, floor space and off-site field work.
- A brief orientation of the IHA/N&S process was presented.
- A set of PHA worksheets were completed by each of technical specialists on the team, i.e., IH, Occ. Safety, Haz, Waste, Fire, ect. using the documentation gathered by EH&S and process knowledge.
- The off-site PHA worksheet was completes as a group effort.

FIELD VALIDATION 70/70A -- Completed 8-2-96

The field validation for Buildings 70 and 70A was completed for ESD. The following notes the agenda:

- A walk-through of Building 70, Rooms 108, 116, 158, and 166, and Building 70A, Rooms 2275, 4419, 4421, and 4429 was conducted.
- Team members verified/edited the PHA woksheets for 8 lab type areas.
- The following researchers were interviewed about lab operations during the walk-through; Hoi-Ying Holman (70-166), Ray Gatti (70A-2275) and Mac Kennedy (70A-4419/4421).
- The verification team consisted of; June Schuabe, Steve Mc Connell, Norm Goldstein, Lisa Snow, Peter Persoff, Ken Barat, Phil Roebuck, and Paul Blodgett.
- 60% of the laboratory space or 25% of the total space that ESD occupies in B70 and B70A was validated.

LBNL Necessary & Sufficient Initiative Process
Core Team Meeting

Minutes for meeting of August 6, 1996

Present:
LBNL: J. Bartley, B. Feinberg, A. Jackson, R. Pauer, M. Schoonover, B. Schleifer, N. Shepard, D. Tudor, P. Williams;
DOE/BSO: T. Goldman, J. Lorence, P. Roebuck, V. Ruggeberg;

Standards Set

Phil Roebuck handed out a compilation of standards to use as a starting list of possible standards to consider. This is a comprehensive list of standards from Fermi, LLNL Pilot, SLAC, Jefferson, and the NTLF Pilot. It was explained that it does not represent all standards and will be revised on an ongoing basis. Nancy Shepard will add a list of state and local standards. Ben asked that good internal standards from other Labs be added as appropriate so we have the opportunity to adopt the best standards available. ANSII standards are available on microfiche at the UC Berkeley library. The Environmental Protection Team is researching non-DOE standards for radioactive use.

There was a discussion of executive orders, and it was agreed ID Teams should code them as "necessary" since the Lab historically interprets them as law. It was decided that "umbrella" standards that include applicable and non-applicable regulations should be handled on a case-by-case basis. Those standards that are largely non-applicable should be identified at the applicable sub-section level.

ACTION: This week ID Teams are to add or remove standards to improve the list

ACTION: Nancy Shepard to prepare a list of State & Local regulations

Sub-Team Reports

All the teams have begun work. Ben has introduced to each team the materials they will be using. He presented the IFA information from SBD, the ID Team Form, the output data from FNL and ANL, and discussed the charge from the Convened Group to the ID Team and the draft milestones of the project.

Some teams will consider adding or replacing team members. Jack Bartley will confirm four new team members.

Lab Safety Team: Phil reported the team will be meeting almost daily for the next two weeks due to the workload. Phil is providing the reasoning for choosing or not choosing a standard available from the FNL and ANL pilots for the team to review.

Facilities & Infrastructure: This team has met twice. Bert reported that the team decided the Federal OSHA will be coded as "necessary" and Cal OSHA applicable sections will be coded as "sufficient".

Accelerators & Fixed Radiation Sources: This team has also met twice and is reviewing the hazards documents for the 88" cyclotron and the ALS. Alan reported all team members are attending and people are being assigned to check particular standards. This week they plan to do a first cut of the standards from the work.

Environmental Protection Team: The team is starting to work on the issues by reviewing the FNL report and putting together a list of issues. Ron will be meeting with Nancy Shepard and Mike Schoonover to go over hazardous waste issues.

Stakeholders Meeting Report

Ben gave a report on the 7/31/96 meeting (see 8/7/96 Convened Group Meeting minutes for content).

The list of work and hazards and the draft standards set will be made available to the stakeholders in sufficient time to allow for their comments. The draft standards will be made available in the second week of September so they will have five weeks to review. ID Teams will address stakeholder comments treating them as any other issues. Those comments wholly implemented will result in a change to the standards set. The N&S report will include a full documentation of stakeholder and ID Team reasoning for partially implemented or non-implemented comments.

LAWRENCE BERKELEY NATIONAL LABORATORY
Bldg: 75B Room: 117 Ext: 7614

August 9, 1996
EP-96-119

MEMORANDUM

TO: Distribution

FROM: Ron Pauer RP

SUBJECT: Necessary & Sufficient (N&S) Meeting Minutes, August 7, 1996

Attendees: B. Feinberg, T. Goldman, R. Pauer, M. Schoonover, C. Schwab, S. Terusaki (LLNL), T. Wan

Hazard Assessments, B. Feinberg
Sharon Buckley already has the Hazard Assessments from Physics, EHS&, Structural Biology, Materials Science and Life Science. Hard copies are available upon request.

List of N&S Standards, R. Pauer
A list of N&S Standards was provided to the EP ID team. It was noted that this is a reference document, a list of standards from other labs that we can use as a starting point, not a list of standards required by any agency or agencies. This list has not yet been reviewed by the environmental professionals in EPG, but will be by the next N&S Core meeting.

ID Team Document and List of Environmental Issues, R. Pauer
The blank ID Team form was handed out, along with a list of environmental issues. Ron stated that we don't have a list of finalized issues yet, but can use this list as a starting point. There is a hard deadline of September 2 to deliver final documents to the Core Group. On the due dates shown on the "N&S Standards" handout, Ron expects each ID Team member to present his findings, as a preliminary draft document. A final draft document will be prepared after discussion and concurrence by the ID Team. These will be reviewed by the Core, Convened, and Confirmed teams before being finalized. Please refer to the attached document for Team Lead and Subject Matter Expert assignments.

Ron reviewed each issue, and Team Lead and Expert assignments.

The assignment of the transportation issue was raised. It was thought that the responsibility could be divided—nonhazardous for Facilities, and hazardous for this group. Ben will see the Facilities ID team tomorrow and will raise the issue with them..

Also questioned was the assignment of the drinking water issue. It was thought that at LBNL this would be a Facilities issue, if this even is an issue, since LBNL does not have its own internal source and adds no significant contamination to the municipally-supplied water.

Ron noted that additional hazards issues may be added if necessary.

Meeting Time, R. Pauer
Meeting time is changed to 9:00 to 10:00 am, and will be held in the Bldg 75B Conference Room.

RP/df

enclosure: EP ID Team—N&S Standards

CONVENED GROUP MEETING
Minutes for meeting of August 7, 1996

Present:

LBNL: B. Feinberg, J. Bartley, K. Berkner, P. Williams; **DOE/BSO:** D. Nolan, P. Roebuck;

LLNL: J. Johnson (telecon), M. Cornell (telecon);

Tara O'Toole's Visit

Ben and Jack presented the agenda for tomorrow's visit. Arrangements have been made for a 1-hour presentation to include the lessons learned from the NTLF and other pilots (Phil Williams), Berkeley Lab's approach to link the work, the hazards and the identification of the standards (Jack Bartley), an overview of how the WSS process is proceeding at Berkeley (Ben Feinberg), and how the results of our process will be assessed (Dave McGraw). Tara will then attend the weekly IFA Team Meeting, get a demonstration of the N&S database, then tour the NTLF, the ALS and the Human Genome Center for a view of a cross-divisional application of the N&S process.

Jack Bartley and Phil Williams discussed the NTLF exemption process which is still unresolved after seven months since DOE has asked the 10 CFR 835 exemption process be used, has only responded verbally with conflicting information on the number of the four requested exemptions approved, and has suggested the exemptions will have to be resubmitted when the regulation is revised. The preferable process would have been to use 10 CFR 20 which is more in keeping with the N&S process of tailoring the standards to the work, and outlines a standard rather than a procedure for Labs to adopt the appropriate set of standards. Concern was expressed that Tara and other key people in DOE have not fully understood the impact of the current exemption process on the Labs, and that it will be necessary to assure the Berkeley Lab Site-Wide N&S Process does not have to go through the same process.

EM Commitment

The letter of commitment from DOE/EH, discussed at the 7/3/96 meeting, has not arrived and is no longer expected. Dick Nolan and Phil Roebuck will distribute a letter from Phil Hill to EM documenting the verbal EM commitment to Berkeley Lab's process. The group expressed continued interest in getting documentation from EH in order to assure a smooth process for the Approval Team.

Stakeholders Meeting

Ben gave a report on the 7/31/96 Stakeholders Meeting. Citizens groups were represented by members from the CEAC and the city planning commission. Other attendees included state regulators and DOE and UC representatives. Some prior issues were discussed and Jack Bartley is sending a package out which addresses the specific issues. Klaus expressed concern that the stakeholders expectations are reasonable so they are not disappointed in cases where there is disagreement with the approved set. Ben noted the stakeholders seemed pleased to have been brought into the process at this early stage and to be assured the local ordinances will be considered along with all other standards. He suggested all stakeholder comments and concerns be entered into the N&S database as issues the same as any other issue from the ID Teams to assure stakeholder concerns are given equal consideration in the process.

IFA and ID Team Status

IFA Teams: Jack reported the MSD report is ready for signature. Physics Division has asked to be involved in a revision of the narrative report, and NERSC is also lagging. Engineering should be ready this week.

Core Team: The all-day meeting on 9/3/96 was announced. Phil Roebuck suggested this meeting be used as an opportunity to consider adopting standards such as external ergonomics standards, and to make final overall decisions.

Sub-Teams: The Environmental Protection Team is pulling a list of standards from the consolidated standards list provided by Phil Roebuck at the Core Team. They will meet today to begin filling out forms. The Lab Safety Team is getting data from the N&S database and is matching current Lab hazards against the FNL and ANL output, considering their logic and reasoning for Berkeley Lab work and hazards. The Facilities & Infrastructure Team scope matches the IFA Facilities Team scope, and are in contact so they can begin work before all the IFA data is available from the N&S database. The Accelerator & Fixed Radiation Source Team are reviewing the hazard documents available from the 88" Cyclotron and the ALS and will have LSD data available soon.

Confirmation Team

It was agreed the letter to the Confirmation Team to go out this week should include the DOE Manual on the N&S Process so the members can begin to acquaint themselves with the process. Jim Johnson, Phil Williams and Jack Bartley added input from N&S Pilot experiences. It was decided a second letter to go out in two weeks will include the Berkeley Lab N&S Charter so the team members can compare how we are following DOE's process. That letter will also encourage members to contact their Convened Group contacts to ask questions and discuss issues.

The group discussed the one or two day orientation and Lab visit. It was agreed to try to allow the Confirmation Team to drive the process and not limit them to a small window for the visit. Between the forms returned by the team members and the ongoing dialog with the CG contacts, we'll get a better idea of when they can visit the Lab and what information they'll need.

Ben suggested development of the language needed for the Confirmation Team signature form in lieu of a consensus form.

Action: Assigned CG members are to provide address and specialty information to Jackie McDonald as they get it, and are to establish an on-going communication with their Confirmation Team contacts.

Action: Phil Roebuck to provide the Confirmation Team letter from ORNL - Johnson Controls for CG review.

Currents Article

It was agreed to develop an article for the 8/23/96 issue of Currents to highlight DOE's commitment to the N&S process at Berkeley Lab.

Action: Dick Nolan and Phil Roebuck to draft an article to include comments from Tara O'Toole.

Subject: **Meeting Record, Facilities & Infrastructure Team Necessary & Sufficient Site-Wide Process**

Date : August 8, 1996

Location: 90K Conference Room

Time: 9:00 a.m.

Present: Paul Johnson
Pat Thorson
Bert Schleifer
Ben Feinberg

Absent: John Bowerman
Chester Chang
James Chwang
Paul Davis
Karl Olson

Meeting Agenda:

- Review Summary Document containing N&S Standards developed by FERMI, SLAC, LLNL, CEBAF and LBNL (NTLF)
- Distribute FERMI Lab ID Team Documentation and assign LBNL and DOE Team members to specific hazard categories

Meeting was adjourned at 10:15 am.

cc: Jack Bartley
Ben Feinberg

Acc. & Fixed Sources I.D. Team
Minutes for meeting of August 8, 1996

Present:

LBNL: B. Feinberg, K. Gershon, A. Jackson, R. Koeppling, P. McMahan;

DOE/BSO: J. Lorence;

DOE/OAK:

Alan handed out the "standards menu" developed by DOE. These will be revised/edited/consolidated as more information comes in.

Alan has met with Mark and Roger during the week. Keith presented standards he had identified thus far (lasers, electrical, RF), to the meeting. Alan is scheduled to meet with Rob on Monday.

Ben reported that a training session on data base entry is scheduled for today at noon. Another way of data entry is to give hand written forms to Cynthia. He also suggested getting the health physicist from Budinger's cyclotron as an expert on the confirmation team.

Peggy reported that there do not appear to be standards for decommissioning. She will get together with Roger and Mike Schoonover to discuss this. Peggy also pointed out that we had missed "oxygen deficiency" from the hazards list.

Next meeting planned for Thursday, August 15, at 10 AM in blg. 4 conference room.

LBNL Necessary & Sufficient Initiative Process
Core Team Meeting

Minutes for meeting of August 13, 1996

Present:

LBNL:	J. Bartley, B. Feinberg, A. Jackson, B. King, R. Pauer, B. Schleifer
DOE/BSO:	P. Roebuck, V. Ruggeberg
DOE/OAK:	C. Schwab, J. Chwang, J. Lorence, D. Decker
DOE/WMD:	R. Kong

Standards Overview

Copies of the Standards Menu and Internal Standards-Other Sites lists were distributed. Ben suggested that software be provided to Cynthia Tilden for maintenance of the menus.

Discussion of the menus revealed a number of hazards would require review by more than one team. It was agreed that more than one team should study such areas and merge the results.

Federal Laws are in place for LBNL and to show we are meeting the Federal codes it was suggested we use statements such as "...used Federal law as implemented by (use implementing agency). When an internal standard has not been completed the statement "Status quo stays in place until superseded" should be used. BSO can identify experts to help write standards. When modifying references such as Pub 3000, update as if implementing standards.

Though typically not obligated to retrofit, codes should be applied to current circumstances. Take a hard look at whether to retrofit when life safety is involved. Implementation is on a case-by-case basis.

Standards Team Assignments at LBNL

Jack and Ben presented a review of the hazards with discussion and delegation of standards to various teams. An electronic version of the list will be provided for further review.

The team discussed planning documents required by DOE Order. It was noted that site environmental report was included by another group as one of their standards.

The database can generate a list of issues, although it is not complete. Jack will review the database completion efforts.

LAWRENCE BERKELEY NATIONAL LABORATORY
Bldg: 75B Room: 117 Ext: 7614

August 14, 1996
EP-96-122

MEMORANDUM

TO: Distribution

FROM: Ron Pauer RP

SUBJECT: Necessary & Sufficient (N&S) Meeting Minutes, August 14, 1996

Attendees: C. Kielusiak, R. Pauer, C. Schwab, N. Shepard, S. Terusaki (LLNL), T. Wan

Not present: B. Feinberg, M. Schoonover, T. Goldman

ID Team Tracking, R. Pauer
Ron passed out the revised list of ID Team issues, with updated ID Team leaders, experts and due dates. All were reminded to please pay attention to the due dates on this list, because scheduling is tight. Ron will report today on his issues 1, 2 and 3. It was clarified that hazards of concern to this group are those that are site-wide, and not more program-specific hazards.

Nancy said that even the N&S determination in each case is a legal issue and needs to be determined, quite possibly by her. She noted that historically, LBNL has taken the position that we're a federal facility exempt from such statutes, but has voluntarily complied as if it were under the same laws as the UC campus. However, now, with so many obscure and potentially onerous regulations, it may be time to make the federal facility argument. For example, H&S Code Sec. 5411.5 could require constant and burdensome reporting of *all* surface water and groundwater discharges.

Asbestos, R. Pauer
Ron presented the first draft of the N&S Standard ID Document for asbestos. Nancy asked whether the asbestos notification law has been considered. She explained that the asbestos notification law, which requires the public and employees be notified of *all* locations with asbestos hazards, may not apply because of the federal facility argument.

PCBs, R. Pauer
Ron presented the first draft of the N&S Standard ID Document for PCBs. This issue is driven by the EPA—PCB TSCA regulations are not delegated to the states. Hazardous waste management for PCBs is included in this issue. Ron would like input from Tim on whether the hazardous waste requirements should be rolled up into the general Hazardous Waste ID Document. Nancy does not know of any PCB laws not mentioned herein.

Aboveground Storage Tanks, R. Pauer
The ID Team document was handed out. Ron noted that there is a recent California law exempting transformers from the definition of an AST, so LBNL has now stopped reporting themin the Annual Storage Statement to the State. If there are any changes in this issue, please get them to Ron quickly.

USTs, C. Schwab

Carl passed out his preliminary list of standards applicable to underground storage tanks. Ron asked Tim whether there are any Alameda County UST requirements, and Tim will check on this.

RP/df

enclosures: EP ID Team—N&S Standards
Standards Menu
Internal Standards—Other Sites
ID Team Documents: Asbestos
PCBs
ASTs
Underground and Aboveground Storage Tank Standards

cc w/enclosures:
Attendees
J. Bartley
S. Buckley
B. Feinberg
T. Goldman, DOE/BSO
P. Persoff
M. Schoonover
C. Tilden

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of August 14, 1996

Present:
LBNL: B. Feinberg, J. Bartley, P. Williams; **UC:** K. Groves; **DOE/BSO:** P. Roebuck;
DOE/OAK: P. Hill, R. Kong; **DOE/HQ:** D. Nelson; **LLNL:** J. Johnson (telecon), M. Cornell (telecon);

IFA & ID Team Status

Jack reported the IFA data is continuing to roll in and three people are entering data into the database. Jack Bartley will then provide summary reports for EH&S, MSD and LSD for distribution and posting. The Physics summary report is being reviewed by researchers and will be ready soon.

Tara OToole and the ID Team leaders were given a demonstration of the N&S database last Thursday. Ben gave an update on the N&S database and explained the current access and dataentry procedures for the ID Team. The database has been developed to pull in the IFA data and sort by hazard category, work activities and divisions as well as any other sort needed. It's available on the AppleShare network for retrieving data while portable databases are being provided by email to ID Teams for dataentry. Then ID Teams are to return the portable databases to Ron Hall who will import the data into the N&S database. During this time of heavy dataentry into the IFA portion of the database, ID Teams are asked to limit their use of the N&S database to printing out reports grouped by sub-team categories then logout of the database.

All the ID Teams are up and running. Phil Williams is preparing the Lab Safety Team by providing training based on the NTLF pilot. The Accelerator & Fixed Radiation Sources Team is helping the other teams. The Facilities & Infrastructure Team has a surprising amount of work. There was agreement in the group that we need to focus on the Facilities Team since the majority of accidents are in their area of review. It was also agreed the Core Team needs to handle the issues related to QA and management soon, then meet with the Convened Group.

> **Action:** Jack Bartley to provide the Fermi language on QA and management issues for next week's Core Team meeting

N&S Final Report

The group reviewed the DOE N&S Manual (M 450.3) requirements for documentation and discussed what will need to go into the final report. There was a preliminary discussion of the report elements such as the introduction and the charter, and it was agreed the report would include the IFA narrative reports along with the N&S database information. Ron Hall has drafted a layout for the report in the N&S database and it was agreed the group would make a decision on the report format once the ID Team has entered enough data that a sample of the layout can be reviewed. TEID will need to edit the ID Team hazard summary reports, which are anticipated to be 1 to 2 pages for each of 100 - 150 issues.

Benchmarking Against Industry Standards

There was a discussion of separating the ID Team consultant activity from the Confirmation team duties. Phil suggested that consultation is inherent in the Confirmation Team and throughout the N&S process. Jack noted he and Dave McGraw are asking their Confirmation Team contacts to provide benchmarking expertise as needed. It was agreed the major issues for the Lab are accelerators, chemicals and bio-hazards. The group is comfortable that the ID Team consultant process is on track. Ben reported the

Accelerator ID Team has requested experts in the accelerator field at UC Davis provide consultation as needed, and he is contacting a consultant used during the building of the ALS. Jack will find a consultant in the area of chemical agents. Jack and Phil reported meetings are being set up with licensing agencies. The group discussed recruiting a consultant with DHS experience.

Institutionalizing the N&S Process

The group agreed to develop an outline by the end of the N&S project. The focus of the discussion was how to get the entire Lab community aware of and involved in the standard set. Ben asked the ongoing process be a look at all levels of the work and what standards the work group really needs with a means of preserving this bottoms up approach. Suggestions included the following:

Use the N&S database as a Lab wide available source for looking up work activities to find the corresponding potential hazards and standards;

Change the FTP and WFO forms to ask PIs if they've checked the N&S database for potential hazards

Standards would be sent out to work groups, as appropriate, with implementation information

OAA would measure performance against the standards implementation tailored to the work

Other Items

Stakeholders Reading Room: Next week these should be set up at libraries at the Lab, Berkeley and Oakland so the draft analysis of work and hazards are available 8/26.

Action: Cynthia to contact Ron Kolb to set up reading rooms

Confirmation Team: Ben emphasized the letters should be sent out by next meeting. A second draft letter will be reviewed at the next meeting. The draft Charge to the Confirmation Team was reviewed and will be revised as needed.

Action: Contacts to send address and specialty information to Cynthia or Jackie

Currents Article: Phil Roebuck has written this and is working with Ron Kolb's office to get it out this week. Ben asked that there be a reminder placed in Currents to ask researchers to provide information on current problematic standards.

Action: Cynthia to contact Ron Kolb to add reminder box

LAWRENCE BERKELEY NATIONAL LABORATORY
FACILITIES DEPARTMENT
Mailstop B90G Ext 5261 FAX 4758

Subjet: **Meeting Record, Facilities & Infrastructure Team**
Necessary & Sufficient Site-Wide Process

Date : August 15, 1996

Location: 90K Conference Room

Time: 9:00 am

Present: John Bowerman
James Chwang
Paul Davis
Paul Johnson
Karl Olson
Pat Thorson
Bert Schleifer

Absent: Chester Chang

Meeting Agenda/Discussion Topics

- Standards Identification for Issues list dated 8/13/96
  - (a) Grouped Issues into the following Hazard/Safety Categories:
    1. Construction: assigned to Bowerman, Thorson, Johnson
    2. Fire: assigned to Bowerman, Chwang
    3. Haz Mat Transportation: assigned to Johnson, Olson
    4. Material Handling: assigned to Johnson, Thorson
    5. Mechanical Hazards: assigned to McConnel,Chang, Thorson
    6. Other Personal Hazards: assigned to McConnel, Davis
    7. Electrical: assigned to Bowerman, Chwang
- Distributed Hardcopies of ID Team Documentation form for issues listed on 8/13/96 list. Team members were requested to identify standards and complete hardcopy form.

Meeting was adjourned at 10:45 am.

Acc. & Fixed Sources I.D. Team
Minutes for meeting of August 15, 1996

Present:

LBNL: R. Connelly, K. Gershon, A. Jackson, R. Koeppling, P. McMahan;

DOE/BSO: J. Lorence;

DOE/OAK: E. Njoku

Alan handed out the updated "standards menu" and standards form other sites as developed by DOE. Also handed out the standards identified by Rob on various Industrial Hygiene issues. After discussion the team agreed that the expanded "accelerator hazards list" covered all the issues raised by the AFRD and NSD Hazard Assessment Teams, and those identified by the Core Group.

The remainder of the meeting was taken up discussing the process, and in particular the next phase of the process. It was agreed that the hand written or hard copy (of data base entry) version of the Identification Team Document should be forwarded to Alan Jackson, and he will ensure that these are circulated for discussion prior to the next meeting, when the standards will be discussed by the Group. The next meeting will be 2 hours! If the Group agrees to standards, they will be forwarded to the data base. If agreement cannot be reached the issue, and prospective standards will be forwarded to the Core Group.

Next meeting planned for Thursday, August 22, at 10 AM in blg. 4 conference room.

LBNL Necessary & Sufficient Initiative Process
Core Team Meeting

Minutes for meeting of August 20, 1996

Present:
LBNL: J. Bartley, A. Jackson, J. Chung, B. King, R. Pauer, M. Schoonover, B. Schleifer, N. Shepard, D. Tudor, P. Williams;
DOE/BSO: C. Chang, J. Chwang, P. Roebuck;

IFA Data

The majority of the IFA data has now been entered into the database, and it is expected to be completely entered on Friday. All the draft summary reports are done and ID Teams should check these to relate the standards to the actual work.

Sub-Team Reports

The teams are addressing the preliminary hazards sets they got from the Core Team. Jack will get an updated draft list of hazards to the ID Team leaders this week. Management issues should be redirected to the Core Team. Jack noted teams may review the work hazards and the standards iteratively and consider rebinning the issues like they are binned in appropriate standards so the standards can be more easily applied. Phil Roebuck reminded the group that teams should continue to focus on the work activities as the basis for including standards in the set.

The ID Teams are generally breaking their teams into work groups to address sets of hazards and report back to the team for discussion. The teams plan to come to consensus on their draft standard sets before sending the portable databases to Ron Hall to import their data.

Facilities & Infrastructure: There are currently about 40 issues which are being addressed in seven sub-categories each assigned to particular team members: construction, hazard material transportation, electrical, fire, material handling, mechanical hazards, and other personnel hazards. A first cut of standards for each category is being developed and will be discussed with the whole team at Thursday's meeting.

Accelerators & Fixed Radiation Sources: This team reviewed 19 hazards and identified which should be further broken out and which should go to other teams. They expect to have all the IDT forms finished this week and then plan a series of meetings to review their findings. They expect to have addressed half the issues by next week.

Environmental Protection Team: Ron Pauer reported the work is going well. Of the 24 issues received, they have covered some and plan to address 10 more issues at tomorrow's meeting. Draft ID documents have been distributed to the team members.

Lab Safety Team: The team met four times last week and will be meeting three times this week and three times the next week. The issues have been allocated to team members, and Phil is helping the group find the resources they need. He will give a 2-hour demonstration on using the database tomorrow. The 30 issues will likely become 60 - 80 work-related issues as the team addresses the actual Lab work hazards. The three issues on radiation will need to be split out to about 20 issues in order to be adequately covered. This team expects to have a draft set they are comfortable with by 9/3/96 and to continue meeting in September to address whether the standards are necessary or sufficient.

State & Local Requirements: "Necessary" vs. "Sufficient"

Nancy Shepard raised the issue of voluntary compliance with federal regulations from which the Lab, as a federal facility, is exempted. It was agreed by all, with varying degrees of sureness, that LBNL is a federal facility and the legal standards for the Lab are limited to those for federal agents or instrumentalities. If an identification team agrees that it would be in the best interest of the laboratory to accept a regulation not legally required, they should use the Identification Team Document to justify accepting such regulations as external standards. An example is the one noted by Bert that the Lab has followed local building codes even though we are legally exempt. Although internally we are concerned with whether a standard is categorized as legally binding or as an external standard, it is likely that stakeholders and the Confirmation Team members will be more concerned with whether a standard is in the set. Being able to demonstrate voluntary compliance with standards applicable to private industry and academic institutions would make the Laboratory's standard set more credible.

Jack suggested following process in the logic flow diagram for the Identification Team Document supports the process and provides the documentation for making these selections:

- The teams include standards that match the work and associated hazards and attempt to designate accurately whether they are legally required of Federal Facilities (1st box) or voluntary acceptance of regulations as external standards (2nd box).

- When the Core Team receives the draft standards sets from the ID Teams, LBNL and DOE Counsel conduct a review to ensure that voluntary compliance is justified as an external standard and not as a legal requirement.

- ID Teams should then review any added standards and use the IDT form to address any "non-value-added" concerns and to identify portions of a standard that should be exempted or, if most of the standard is not applicable, the portion that is applicable. Case-by-case concerns should be brought to the Core Team as needed.

LAWRENCE BERKELEY NATIONAL LABORATORY
Bldg: 75B Room: 117 Ext: 7614

August 23, 1996
EP-96-124

MEMORANDUM

TO: Distribution

FROM: Ron Pauer RP

SUBJECT: Necessary & Sufficient (N&S) Meeting Minutes, August 21, 1996

Attendees: C. Kielusiak, R. Pauer, M. Schoonover, C. Schwab, N. Shepard, S. Terusaki (LLNL), T. Wan

Not present: B. Feinberg, T. Goldman, P. Persoff

ID Team Tracking, R. Pauer
Ron passed out the latest revised list of ID Team issues. Changes were briefly discussed.

General Activities
Tim met with Nancy for 3 hours; they put together a list of applicable City and Alameda County ordinances. Tim has since been checking in law libraries, law handbooks and the LEXIS database to verify which ordinances are current, but has not had time to finish this.

The application of a state asbestos ordinance to federal facilities, such as LBNL, was discussed. Many building owners are posting asbestos warning signs even when not strictly required to, to avoid future liability for employees. Maintenance personnel at LBNL are supposed to be trained where known hazards are, and how to recognize potential unknown ones. Nancy added that there is a legal opinion by Glenn Woods on file, several years old, advising that the Lab should follow this asbestos ordinance, although not required to do so. Nancy will review this issue with Glenn Woods, and discuss it with the team at the next meeting.

Ron asked whether friable waste asbestos should be addressed in this issue, or in the hazardous waste document. Nancy replied that it's considered "hazardous" under California law, but can be disposed of in a non-hazardous (Class 2) landfill *if* RWQCB standards are met. Ron asked Tim to address this issue in the hazardous waste document; also PCBs.

Preparation of the Site ER, R. Pauer
Ron passed out this ID document. This is required by the DOE Order and Manual cited. By using the Order instead of the entire Manual, LBNL could produce a Site ER much like those from private industry, giving highlights of their EH&S programs instead of every last detail. Carl asked if part of the justification for the thick Site ER wasn't for public information. Ron doesn't think an SER this thick is to the public's benefit, that few read the entire volume.

Carl will phone DOE headquarters and see what they think about this proposal. He believes this will be all right with them. His only caveat is that DOE may wish to have a similar format for all Site ERs from its facilities around the country.

Environmental Monitoring Program, R. Pauer
The ID Team document was handed out. The EMP is driven by DOE Order 5400.1, as cited. Only particular paragraphs in Chapter IV, not the entire Order, were selected. Stan noted that LLNL tried to tailor these requirements for its site, but after lengthy discussions and arguments with DOE personnel, decided to cite the entire chapter.

NEPA/CEQA Reviews, C. Kielusiak
Carol passed out her ID team document for this topic, which she has given an issue name of "Environmental Protection Planning." She has determined that CEQA standards are delegated from UC and are "necessary." NEPA standards are not delegated from DOE and are not identified as "necessary or sufficient."

Waste/Nonhazardous, T. Wan
Tim passed out his draft of this ID document. It was noted that SB14 was not listed, since it only covers hazardous wastes.

Tim noted that Alameda County Measure D now has a 75% requirement to divert solid waste from landfill, up from 50. Mike wanted to know if following this County Measure was really required of our federal facility. Nancy answered that the "sovereign immunity" clause excepting LBNL from all hazardous and solid-waste requirements is now gone, so we do have to apply such a Measure, unless there is a conflict with federal law.

Tim added that our current DOE contract calls for a 10% waste reduction. It was noted that this should be considered an internal requirement, not a legal one, since it is subject to renegotiation in our upcoming contract talks.

Next Meeting, R. Pauer
Mike wanted to meet separately with Nancy, Tim and Carol to discuss rad standards. Carl suggested including Steve Lasell.

There will be an additional off-schedule meeting for this group, from 10:00 am until (if necessary) noon, in the 75B Conference Room on Monday, August 26.

RP/df

enclosures: EP ID Team—N&S Standards
ID Team Documents: Waste/Nonhazardous
Site Environmental Report
Environmental Monitoring Program
Environmental Protection Planning

cc w/enclosures:
Attendees
J. Bartley
S. Buckley
B. Feinberg
T. Goldman, DOE/BSO
P. Persoff
C. Tilden

CONVENED GROUP MEETING
Minutes for meeting of August 21, 1996

***Present*:**

LBNL: J. Bartley, P. Williams; **UC:** H. Hatayama; **DOE/BSO:** P. Roebuck;

DOE/OAK: R. Kong, C. Simkins (telecon); **DOE/HQ:** D. Nelson;

IFA & ID Team Status

IFA Output: Jack has seen a printout of all the hazards and comments and level of concern which he'll distribute to the ID Teams. He will distribute updates when all the data is in, probably Monday. He noted the data is arranged in a useful way for this project. Phil Williams is giving a demonstration of the IFA Database tomorrow. Charlie Simkins plans to get acquainted with this database and present some information on it to DSC.

Core Team: Facilities and Environmental Protection teams are proceeding comfortably and the Accelerator team is moving ahead. The Lab Safety team is getting the bulk and greatest complexity of issues. They're struggling but will meet the deadline, however they may continue to identify standards into September. The group agreed this is OK if about 90% of the standards are identified on schedule.

The legal requirements from which federal facilities are exempt will be coded as external standards, if applicable, and will be reviewed by counsel. Jack and Howard noted local ordinances can't preempt higher level authorities but can mimic or elevate standards, and suggested we approach federal standards first, then address state then local implementations. Howard noted our current contract binds us to applicable state and local environmental standards.

Next week the Core Team will address management issues and the N&S final report.

ACTION: Jack to distribute IFA Database output to ID Team Leaders.

Stakeholders Reading Room

The group agreed the narrative IFA reports and a list of found hazards be made available for the Stakeholder Reading Rooms in libraries and on the web next week. Charlie Simkins suggested we keep track of the number of stakeholders who access the resources. There was a discussion of making true drafts (not problem drafts) available for review, and agreement that Stakeholder contributions to drafts are useful.

ACTION: Jack to provide IFA reports for the reading room

ACTION: Cynthia to have a counter put on the external N&S Website and ask Ron Kolb to arrange with libraries to keep track of users.

Confirmation Team

The first letter has gone out to identified team members. The Convened Group is continuing to identify and contact potential members, and the group discussed particular people and institutions to contact.

The group approved the draft second letter and the charge which is scheduled to go out next week with a draft of the Charter. Jack asked the group to review the draft Charter and submit any changes by Monday.

There was discussion of the consulting costs since there have been a couple of requests for payment from the

Confirmation Team. Jack will check if they can be set up as PSAs. Phil Roebuck mentioned ORISE has a system which would allow the consultant to be paid by DOE and used at other sites, he will check with Charlie Billups for details since this was agreed to potentially be a better system.

ACTION: Contacts to provide information to Jackie McDonald as soon as team members agree to serve.

ACTION: Group to provide changes to the draft Charter - going to the Confirmation Team - by COB 8/26/96 to Jack or Ben.

Contract Modification and Authorization Agreements

There was a discussion of what changes to the contract should be made. Phil Williams suggested it be non-specific at the contract level so changes don't need to be made when standards are changed, such as changes to PUB 3000. Howard suggested DOE 450.3 and a statement in the EH&S Article citing we will follow applicable laws and regulations go in the contract, and everything else be covered by authorization agreements. He stated directives like Occurrence Reporting would go into the contract since they are not a part of N&S.

Charlie Simkins suggested we develop a rationale statement of the Lab's safety operations. Jack agreed to work on this.

Other Items

Schedule of Deliverables: Phil Roebuck went over the N&S Calendar and suggested changes which were approved by the group.

ACTION: Cynthia to update the N&S Calendar

Charter: The group agreed that biographies for the Extended Confirmation Team should be included in the CV Appendix, and that a summary by team of the total years of EH&S experience and the number of advanced degrees be provided.

Final Report: Cynthia distributed a preliminary draft of the elements and activities under discussion. Jack will get comments on the final report from ID Team Leaders in the next Core Team. Charlie suggested the group check the DSC Home Page on this topic, and discussed SPAT 11 - the documentation SPAT. Phil Williams noted the SPAT addresses the needed elements for the approving authorities and doesn't address the more expansive situation where the report is to have other uses.

ACTION: Cynthia to provide the draft Report Information to ID Team leaders

LANL Site-Wide N&S: Howard Hatayama sits on the Convened Group at LANL and gave an update of the project. LANL has unique issues to overcome and is using this project to rebaseline the Lab standards. This report brought up the generic issue of what should go into the contract and what should stay as a site-specific authorization agreement.

LAWRENCE BERKELEY NATIONAL LABORATORY
Bldg: 75B Room: 117 Ext: 7614

September 6, 1996
EP-96-133

MEMORANDUM

TO: Distribution

FROM: Ron Pauer RP

SUBJECT: Necessary & Sufficient (N&S) Meeting Minutes, August 28, 1996

Attendees: B. Feinberg, C. Kielusiak, R. Pauer, M. Schoonover, C. Schwab, N. Shepard, S. Terusaki (LLNL), T. Wan

Not present: T. Goldman, P. Persoff

ID Team Tracking, R. Pauer
Ron passed out the latest revised list of ID Team issues. Changes were briefly discussed.

Cultural Resources, C. Kielusiak
Carol passed out her ID team document. Many laws apply, so see the separate sheet listing them. The Bevatron and one other building are registered historical landmarks for this purpose. Also, off-site researchers perform activities which may be impacted by this issue. It's a DOE requirement to inventory LBNL buildings for historical significance. There's no formal driver for LBNL to do this, so the statement should be something like "the Lab will continue to assist DOE." With respect to the state, this evaluation is required as part of CEQA.

Ron pointed out that the NEPA standards can't be delegated to the Lab by DOE. Therefore he would take the approach that this likewise applies for such a building inventory. Also, we could possibly roll up this issue under CEQA. Ron asked whether the National Historical Preservation Act is a driver for DOE, or for the Lab. Carol replied, for DOE. Ron inquired whether the Lab can and should be doing this for the DOE. Carol answered that DOE lacks the specific knowledge and expertise in the historical value of LBNL buildings, so needs the Lab to do this for them. The Lab usually hires a consultant to assist in this process—or Carol herself can do it, since she is trained as an archeologist.

Floodplains/Wetlands, C. Kielusiak
Carol passed out her ID document for this issue. Ron asked whether we even have "wetlands" on-site. Carol replied that the area downhill from the old poultry management area definitely meets the standards; probably several others, including those created by hydraugers. DOE is implementing regs that "may require applicants to submit a report," so this may be considered under Section 404 of the Clean Water Act. Nancy added that this does apply to us as a federal facility. Even wetlands and usually-dry arroyos are covered under the "navigable waters" clause therein.

Ron asked Carol to please review the two Executive Orders cited, to see whether they order DOE and/or the Lab to actually do anything.

Endangered Species, C. Kielusiak
Carol's ID document was passed around. She pointed out that the Endangered Species Act applies directly to federal agencies. The Lab has no formal agreement with DOE under the Act, so it's not directly our responsibility and we "assist" DOE. Only the California Endangered Species Act applies directly to us.

Nancy expressed the legal opinion that the Lab is not a federal agency, so the Act doesn't apply to us. Ron asked whether the federal law has a waiver of sovereign immunity. Nancy answered that she's not sure; however, she can show Carol what the wording and placement of a typical such clause looks like, so Carol can search the Act for one.

Hazardous Waste/Nonrad, T. Wan
Tim handed out the ID document. This includes: the old and new Hazardous Waste Handling Facilities (B75 and B85), all Waste Accumulation Areas, B76, B25, and waste disposal. Ben asked whether federal law supersedes the state laws cited. Nancy answered that under 42 USC 6961, not for hazardous waste—under that law, we must also comply with all applicable state laws also. Ron asked which Memorandum of Understanding, as cited, applies. Nancy replied that it is an old MOU, on hazardous waste generation, for the Berkeley portion of the lab only.

Medical Waste, T. Wan
For medical waste, Tim noted that it's covered under the H&S Code; there is tracking under RCRA; and blood-borne hazards are covered under state law. Nancy asked whether blood is considered "hazardous" or "solid" waste. Ron would like to make medical a separate waste category for now; Nancy agrees with this.

Hazardous Waste/Rad & Mixed, M. Schoonover
Mike passed out his ID document. He was thinking about leaving out reference to 10 CFR 835, but left it in for now. It is internally associated with processing, and all rad controls. Ben added that there will be input from the accelerator ID team anyway.

Nancy asked what DOE Order 5820.20 says. Mike replied that it doesn't add anything to the other requirements already discussed. Nancy noted that 5400.5 is the general statement. Mike thinks it is not directly applicable to the Lab, and noted that Livermore Lab went with 10 CFR 835 only; and for EBMUD purposes only, Title 17 as applicable.

Ron has already asked Tim to speak with Robin Wendt about this issue. Mike asked whether the topic should be deferred until then. Ron replied yes, and will set up a follow-up meeting to close this issue.

Nancy added that we should also cite the Site Treatment Plan. It's an agreement under FFCA, and like a consent or compliance order.

Ozone-Depleting Substances, C. Schwab
Carl only received the case narrative and list of standards he passed out this (Wednesday) morning from Gary Lavagnino.

Nancy noted that re the Clean Air Act amendments specific to federal agencies, these are important versus City of Berkeley regulations, when we make the federal facility argument. She suggests saying that the CoB's regs are neither "necessary" nor "sufficient," since they're pre-empted by federal law.

Sanitary Sewer Discharges, C. Schwab
Carl needs to discuss this issue with Steve Lasell. Ron replied that he already has, on the phone. He will roll up what Steve said into one document with Carl's input.

Nancy asked whether EBMUD has rad sewer limits. Ron answered yes, under Title 17, because this is referenced by our EBMUD Permit. Nancy noted that this is not under the authority of the Clean Water Act. She stated that there should be a note to the Water Code 13000 et seq citation, that the Permit must require compliance with local and state water codes.

Ron does not plan to include the draft requirement for 10 CFR 834 here. Steve suggested using portions of DOE Orders 5400.1 and 5400.5, but only those sections selected for being appropriate and valuable.

Next Meeting, R. Pauer
As scheduled, 9:00 am Wednesday, Sept 4, in the 75B Conference Room.

RP/df

enclosures: EP ID Team—N&S Standards
ID Team Documents: Cultural Resources
Floodplains/Wetlands
Endangered Species
Hazardous Waste/Nonrad
Radioactive and Mixed Waste
ODS
Environmental Standards—Sanitary Sewer Discharges

cc w/enclosures:
Attendees
J. Bartley
S. Buckley
B. Feinberg
P. Persoff
C. Tilden

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of August 28, 1996

Present:
LBNL: B. Feinberg, J. Bartley, D. McGraw; **UC:** K. Groves; **DOE/BSO:** D. Nolan, P. Roebuck; **LLNL:** Jim Johnson

IFA & ID Team Status

IFA Output for the Stakeholder Reading Room: All but two summary reports are ready, and it is expected that the set will be complete by the end of the week. Ron Kolb has suggested we get the set complete before delivering it to the libraries. About half the reports are posted on the website Reading Room and the rest of the available reports should be posted by tomorrow. Ben emphasized the reports should be clearly labeled as drafts at this stage.

IFA Data for ID Teams: All the IFA data has been entered into the N&S database, and ID Teams have received draft and final printouts of the data. It was reiterated that the ID Teams have had access to the data as it was produced by distribution of hardcopies and in the DOE conference room files.

Core Team: The Core Team is operating in a problem-solving mode with the members being flexible and addressing issues. Some issues, such as ergonomics, will be handled by the Core Team specifically. Mike Schoonover has done an analysis of CFR 835 and CFR 20 which will be useful to the Lab.

The group suggested next week's Core Team meeting be structured to discover any issues that are outstanding as they review the draft standards sets from the sub-teams. Next week the Convened Group will address the Core Team's draft standards set. Back up meetings for the Core Team on Thursday and the Convened Group on Friday will be arranged to cover any unfinished items.

ID Sub Teams: The Accelerator/Fixed Radiation Sources Team has discussed that a pointer to the federal laws section marked not value-added is for the purpose of flagging possible requirement exemptions in the future and doesn't indicate we're not following the requirement. This was mentioned as an example that there is general understanding of this in the teams. The Environmental Protection Team will get help from Nancy Shepard to identify those regulations DOE is explicitly required to follow and can't delegate. The team has included the applicable sections of these regulations into their draft standards set. Phil Roebuck and Dick Nolan commented on the reasonableness of the approach. Phil noted the rigorous schedule is working because the team members are already well informed and up to speed on the issues and standards.

The Lab Safety Team and Environmental Protection Team have entered their forms into the database. Cynthia will arrange dataentry for the Accelerator/Fixed Radiation Sources Team and the Facilities Team.

N&S Final Report

The group went over the draft elements of the report. The report will also have a summary of the Stakeholders comments and how they were handled. It was agreed the main report without the appendices would be put on the Web.

Stakeholders

The Reading Rooms will be set up in four sites by Friday: Oakland Library, Berkeley Library, Berkeley Lab Library, and the DOE Public Information Office. The Web site is being updated as IFA Reports are made available - about half are currently posted.

The Core Team will handle the Stakeholder comments then send them to the Convened Group. The Confirmation Team may need to be informed of Stakeholder issues. The group discussed how to flag the issues in the database so the Stakeholder set can be retrieved.

Other Items

Consultant Costs: The group agreed to compensate the Confirmation Team members upon request, and decided to go through the Lab's internal process of PSAs since it is fastest. Meanwhile, Phil Roebuck will check if ORISE has available funding.

Contract Mod: A draft agreement letter was reviewed and changes were suggested. The group agreed the current contract should be modified with this letter, the standards set and a list of deletions.

Confirmation Team Visit
The group agreed 10/7 and 10/8 would be the dates for the Lab visit. The Core Team and some of the Extended Convened Group should be present at the beginning, then on-call during the visit.

Review Teams:
Ben will deliver draft standard sets to the Review Teams next week.

LAWRENCE BERKELEY NATIONAL LABORATORY
FACILITIES DEPARTMENT
Mailstop B90G Ext 5261 FAX 4758

Subjet: **Meeting Record, Facilities & Infrastructure Team Necessary & Sufficient Site-Wide Process**

Date : September 4, 1996

Location: 90K Conference Room

Time: 9:00 am

Present: Chester Chang
James Chwang
Paul Davis
Steve McConnell
Pat Thorson
Bert Schleifer
Tony Yuen, Subject Matter Expert for Fire Protection

Absent: John Bowerman
Paul Johnson
Karl Olson

Meeting Agenda/Discussion Topics:

Discussed procedural recommendations from core team mtg 9/3/96

Discussed Standards Requirements for Fire Protection

Reviewed IFA Issues List, added additional Facilities Issues

Meeting was adjourned at 12:00 am.

c: Jack Bartley
Ben Feinberg

LAWRENCE BERKELEY NATIONAL LABORATORY
Bldg: 75B Room: 117 Ext: 7614

September 6, 1996
EP-96-135

MEMORANDUM

TO: Distribution

FROM: Ron Pauer RP

SUBJECT: Necessary & Sufficient (N&S) Meeting Minutes, September 4, 1996

Attendees: C. Kielusiak, R. Pauer, M. Schoonover, C. Schwab, T. Wan

Not present: B. Feinberg, T. Goldman, P. Persoff, N. Shepard, S. Terusaki (LLNL)

ID Team Tracking, R. Pauer
Ron passed out the latest revised list of ID Team issues, with all current ID documents attached. Changes were briefly discussed.

Ron's schedule is that he has to hand in a copy of this group's standards set by the end of today (Wednesday). He needs all comments from this Team by 2:30pm today, in time to enter them into his FileMaker database. Any comments that come up after that can still be addressed but changes to be database may be more difficult. Carl requested an electronic copy of Ron's current database for distribution within DOE, including Hattie Carwell.

Ron has a meeting at 10:00am today (Wed) with the Convened team, re how to treat the EOs. These assign responsibilities to DOE; however, their link to DOE contractors is subject to interpretation. Ron added that this is dependent on the wording of each individual EO.

Tim asked whether Nancy and Ron reviewed all of this group's documents in their meeting. Ron replied that there was only time to review 7 or 8 in their three-hour meeting. Tim wondered whether if Nancy has already looked at a document from a legal point of view, it could be considered "reviewed" so he wouldn't have to do a duplicate review. Ron would still like Tim to look at the documents again, especially with regard to whether the Lab or DOE has responsibility—especially for medical and hazardous waste, which he did not review with Nancy.

Ron added that a good rationale is especially needed when we determine requirements are "sufficient" but not "necessary; that we need a good justification to say they add value but aren't legally required.

Next Meeting, R. Pauer
None for this group—Convened and Core meetings only.

RP/df

enclosures: EP ID Team—N&S Standards
ID Team Documents: All

LAWRENCE BERKELEY NATIONAL LABORATORY
Bldg: 75B Room: 117 Ext: 7614

cc w/enclosures:
Attendees
J. Bartley
S. Buckley
B. Feinberg
T. Goldman
P. Persoff
N. Shepard
C. Tilden
S. Terusaki (LLNL)

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of September 4, 1996

Present:
LBNL: B. Feinberg, J. Bartley, N. Shepard; **UC:** H. Hatayama; **DOE/BSO:** D. Nolan, P. Roebuck; **DOE/OAK:** H. Brosler (telecon), R. Kong (telecon), J. Parenti (telecon), C. Simkins; **LLNL:** J. Johnson (telecon); **FNL:** L. Coulson (telecon)

Core Team Status

The Core Team decided at it's meeting yesterday that it will add an iterative process with the ID Teams. It was noted the strength of the set depends on the ownership and pride of the team members. Lab counsel will also review the changes to the hazards documents, which may include added narratives. The Environmental Protection Team draft set was improved upon, and Ron Pauer has given the updates to Nancy Shepard to review this morning. The Core Team hasn't had the opportunity to hear from all the teams yet, so all the issues haven't developed.

Jack noted the N&S process is leading us to develop a sensible and cost-effective program. Ben added he's very pleased with how the work is progressing and is optimistic the schedule will only need minor changes. The group will review the schedule on Friday.

Draft Standard Set

There was a discussion of what should be delivered to the Confirmation Team. Phil Williams and Larry Coulson both provided their Pilot experiences and it was agreed the Confirmation Team would benefit from receiving the draft forms as they are without the added narratives so they can get started, and receive the revised forms during their visit.

The group discussed Executive Orders and whether they are to be termed legal requirements in the N&S process. Phil Roebuck noted there is not uniform interpretation across the Pilots. Larry Coulson said Fermi included applicable executive orders but didn't separate out "necessary" from "sufficient" in the final set. It was agreed those which are DOE requirements in which the Lab activity assists DOE in meeting its standards would be "sufficient" rather than "necessary". Nancy Shepard is going to check the legality with regard to applicability to agency and instrumentality, and the group agreed this could be done in parallel with the N&S process.

Voluntary adherence to Berkeley standards was discussed in detail. It was agreed the Convened Group is not charged with altering Lab policy, so we intend to maintain Lab policy including such activities as reporting chemical inventory under the Berkeley ordinance, and that these standards should be labeled "sufficient" with a note that we are doing this voluntarily to be a "good neighbor".

Permits and NRC licenses were agreed to be implementation elements of statutes and not standards. The forms should carry the wording "and all applicable permits" as appropriate. Larry Coulson noted Fermi made this same determination.

Property protection from fire was agreed to be an insurance issue rather than a N&S issue. Fermi also chose to deal with this outside of N&S, and kept only the property protection portion of 5480.7 in their contract. The group agreed to do the same.

Lab Community Input on EH&S Standards

An all-employees email notice was sent from Klaus Berkner's office last week requesting suggestions on the current EH&S regulations, which produced the first wave of Lab input. The suggestions are being routed to the appropriate ID Teams as they are received. Ben will follow up with the ID Teams and will respond back to the inputters on the status of their suggestions.

So far the researcher input shows the most important issue is improving implementation of the standards. Ben emphasized this message be acted upon in the implementation phase. He noted we should remember the usefulness of the Level 1 GA email approach when in the implementation phase and consider a similar email notice when the IFA performs an annual review of the set.

Other Items

Stakeholder Reading Room: The IFA Reports and the hazard list were delivered on Friday to the Berkeley and Oakland libraries, the DOE Energy Information Center in Oakland, and were made available in the Lab library and on the N&S website.

Confirmation Team: The team members were reviewed. 20 have now been contacted and it was agreed to add to the team expertise in the areas of construction, lasers and add a local industrial contract for biohazards. The group decided to add travel and visiting information regarding the October visit to the second Confirmation Team letter, and provide a supplement letter to those who have already received the second letter. Phil Roebuck reported on the ORISE procedure for reimbursing WSS consultants, but the group found the procedure to be too bureaucratic to be useful for this project.

Final Report: Last week a process was worked out for TEID and ICSD to start work on the report. Sharon Buckley will be the point of contact and will provide a daily dump of the ID Team data. Ron Hall is creating new issue forms.

Currents Article: Next week the group will begin to develop another article which will probably provide feedback to the Lab community suggestions on the current ES&H requirements and announce the current status of the N&S Project.

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of September 6, 1996

Present:
LBNL: B. Feinberg, J. Bartley, D. McGraw; **UC:** H. Hatayama; **DOE/BSO:** D. Nolan, P. Roebuck; **LLNL:** J. Sims;

Core Team Status

The Core Team has been meeting with the ID Teams over the past week refining the information on how to fill out the forms and ongoing training on the process. While the Fermi forms were distributed to the teams and the forms were discussed as far back as June, they are finding the actual standards identification is bringing up grey areas and issues which need discussion. Jack Bartley gave the example of an ANSI standard which a professional may think of as a legal requirement because its applied every day but may in fact be used voluntarily for professional results. In this process the source of the standard and its particular legal status to the Lab needs to be explored.

The Core Team is applying the Convened Group decisions recorded in the 9/4/96 minutes. Scott Taylor of the Lab Safety Review Committee is attending the ID Team and providing invaluable representation from the Internal Review Team. Phil Roebuck and Ben Feinberg noted the teams are not running into disagreements but time for discussion among the experts is needed to set the category of standard and handle other decisions necessary in this process.

Three issues were raised to the Convened Group for decision:

Internal Standards: The group agreed to accept references to internal standards that have not yet been developed.

It was agreed 10 CFR 835 is a legal standard for the Lab since it applies to DOE work. There was discussion of how this may change as DOE moves to external standards such as 10 CFR 20 which is NRC.

The executive order on seismic safety of federal buildings was discussed. If it is a survey to determine the total cost to upgrade federal facilities and not an order addressing risk, it was agreed it does not belong in the set. Phil Roebuck will check into this.

Draft Standard Set

The group decided the set to be delivered to the Confirmation Team and the Stakeholder Reading Rooms on 9/16/96 should include an introduction that addresses the EH&S management issues and the groundrules for choosing standards. Phil Roebuck and Ben Feinberg will develop these for review for next week. The second Stakeholders Meeting (10/16/96) should address what changes from the draft set were made, and provide the stakeholders with an understanding of the recent changes in the DOE environment and DOE Orders.

ES&H Management Orders

There was a discussion of the ES&H management orders. It was agreed to lay the groundwork now to identify DOE and UC intent to remove any remaining ES&H management orders from our contract

when DOE approves the Lab Integrated Safety Management Plan. The group did not resolve how this will be done and whether any ES&H management orders should be on the N&S contract modification list of deleted ES&H Orders. Jack reminded the group of the N&S concept that to include a requirement, a hazard should first be identified, and encouraged that thinking process be applied to the ES&H management orders.

N&S Schedule

Changes were made to the internal milestones to allow for plenty of time for the Confirmation Team involvement. The group agreed the end-date of the project does not need to be changed.

LAWRENCE BERKELEY NATIONAL LABORATORY
FACILITIES DEPARTMENT
Mailstop B90G Ext 5261 FAX 4758

Subjet: **Meeting Record, Facilities & Infrastructure Team Necessary & Sufficient Site-Wide Process**

Date : September 9, 1996

Location: 90-4133 Conference Room

Time: 9:00 am

Present: John Bowerman
Chester Chang
James Chwang
Paul Davis
Steve McConnell
Paul Johnson
Karl Olson
Pat Thorson
Bert Schleifer

Absent: None

Meeting Agenda/Discussion Topics:
Reviewed Draft ID Team Documents

Meeting was adjourned at 12:30 pm.

c: Jack Bartley
Ben Feinberg

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of September 13, 1996

Present:
LBNL: B. Feinberg, J. Bartley, A. Jackson, D. McGraw, B. Schleifer, P. Williams; **UC:** H. Hatayama; **DOE/BSO:** P. Roebuck; **DOE/OAK:** R. Kong; **FNL:** L. Coulson (telecon)

Draft Standards Set

The group reviewed the draft output from the database and a grouping of issues and decided on the format and content of the set to send to the Confirmation Team, the Internal Review Team and the Stakeholders on 9/16/96. The database now has 173 issues and 107 of them have standards associated with them. Ben and Jack will revise the draft set per the agreement of the group. It was agreed to make the specific forms available upon request rather than send out all the forms at this time in order to avoid confusion. The introduction was reviewed and revised to clarify the meaning of the criteria. The group approved the draft set, and a final approval by the Core Team will be done this afternoon.

ES&H Management Orders

Originally, the group agreed to follow the Fermi model to keep the existing Lab implementation system in place rather than keeping the ES&H management orders in the contract. Ben and others noted we have a system in place and the authority to change the orders now and we may not in the implementation phase. Phil Roebuck also noted the DSC is trending towards not addressing the management orders in WSS and Phil Williams noted the general DOE landscape as evidenced by DNSFB 95-2 has changed since Fermi's pilot. Jack suggested we assemble a team to work towards a 1/97 goal of addressing the ISMS, a DOE guidance document expected out soon.

Identification Team

Bert Schleifer asked the group for approval to include CAL OSHA as a sufficient standard for construction safety. The group agreed.

The Identification Teams are to have made their final input to the database by Friday, 9/20/96, and on 9/30/96 a second draft of the set is due. (see N&S Calendar)\

The Identification Team summary reports were discussed. Jack has asked Ron Pauer to develop a sample which will be used by all the teams to avoid duplications and assure all areas are covered. Ben asked that the summary include the reasoning behind the set, what is required by law and what is being included as "sufficient" (whether external or internal standard), and implementation information.

Confirmation Team 2-Day Visit

The agenda was discussed and will be announced at the 9/23 conference call. Next week the group will review the draft agenda. Phil Roebuck will get forms for the Confirmation Team members to each sign. Phil Williams and Larry Coulson added perspectives from their pilots to the discussion.

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of September 18, 1996

Present:
LBNL: B. Feinberg, J. Bartley, D. McGraw, P. Williams; **UC:** H. Hatayama; **DOE/BSO:** P. Roebuck; **DOE/HQ:** D. Nelson; **FNL:** L. Coulson (telecon) **LLNL:** J. Sims

Standards Set & ES&H Management Orders

The group decided to include the present ES&H management orders in the set with a statement that we'll look at their inclusion in the implementation phase. Ben suggested the standards be grouped in three categories: WSS Standards, Safety Orders being deleted, and Safety management orders to be determined if they should be deleted upon completion and approval of the ISM Plan.

The group discussed which ES&H orders and portions of orders should be deleted from the contract. The ID Teams are sufficiently identifying portions of ES&H standards which are in the set, but we also need to list which ES&H orders are to be removed so these are added to the list of deleted orders. Phil Williams suggested we use the DNFSB list as a baseline set of ES&H and ES&H management orders. Phil Roebuck will distribute this to the group, and Ben will distribute the list of Appendix G orders as another baseline to consider.

Ben noted we need to decide by mid to late October which are safety standards, which are safety management standards, and which are safety standards with management portions that need to be addressed. Jack suggested the ISMS Team, which is being formed, handle this. This effort will essentially be a pilot program for this area of WSS, so the group discussed the possibility of getting DSC certification for identifying the standards that do and don't belong in a WSS set. It was noted LLNL will be addressing the management orders at the same time, so the ISMS may be able to include them in the effort.

A team was set up to compile a definitive list of ES&H orders, and separate out ES&H management orders or ES&H management sections of orders to be addressed during the implementation phase. The team consists of Ralph Kopenhaver, Howard Hatayama, Phil Roebuck, David McGraw, and Ben Feinberg.

ACTION: Phil Roebuck to distribute the DNFSB list, Ben to distribute Appendix G list

ACTION: Phil Roebuck to alert Ralph of team formation

ACTION: Phil Roebuck to check with Charlie Simkins on DSC Certification

Core Team

The Core Team met yesterday, and they understand that detailed justification for the "sufficient" standards needs to be added to the forms. Ron Hall updated the database and it can now be edited on-line. Ben is working with Ron Pauer to eliminate some duplications of standards.

The only outstanding issue, regarding external standards needed, is being discussed in the Core Team and with the Radiation Protection team members. The group agreed this should be resolved by a separate group of radiation experts. A meeting has been scheduled for Monday 9/23/96 with Lab and

DOE technical participants. The agenda is to resolve, or document the disagreement and bring to the convened group, the technical and policy issues relating to the inclusion of 10CFR20 in the standards.

Confirmation Team

The Confirmation Team will be contacted this week to remind them about the 9/23/96 conference call and the 10/7-10/8 visit. The group discussed the tours to be prepared for the visit and reviewed the draft agenda.

ACTION: Ben to select a chairperson for the Confirmation Team

ACTION: Jack to arrange for tour guides for all but the ALS tour

ACTION: Ben to arrange for ALS tour guide

Final Report

The group reviewed the elements of the final report and made some revisions. Ben will check the SPAT11 and the Manual to be sure all documentation requirements are covered in our report. Once the report elements are finalized it should be given to the Core Team so the ID Team Leaders know what is expected of them.

ACTION: Ben to revise the report elements as needed for the next meeting

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of September 25, 1996

Present:
LBNL: B. Feinberg, J. Bartley, K. Berkner; **UC:** K. Groves; **DOE/BSO:** D. Nolan, P. Roebuck; **DOE/OAK:** R. Kong, C. Simkins; **DOE/HQ:** D. Nelson; **FNL:** L. Coulson (telecon) **LLNL:** J. Sims

Confirmation Team

The group discussed the 9/23/96 conference call. Ben noted the team demonstrated a good understanding of the process and Phil Roebuck added the team contributed forward-looking suggestions and had useful recommendations on specific issues. The team suggested the Charter be finalized, and the group agreed it is final. Other suggestions included ensuring that significant effects of the standards are pointed out in narratives, recombinant DNA guidelines be added, liability for contract employees and addressing defects in products (10CFR21) be addressed, and made other suggestions already being addressed by our radiation experts.

The group discussed the 10/7-10/8 visit in detail. They agreed assurance needs to be built into the visit so all team members are represented in the Confirmation Team process and the subject matter experts are available to them during the questions period. The group reviewed the letter and agenda for the 2-day visit to go out 9/30/96. The letter was approved and the agenda will be revised. The signature forms were discussed and will be drafted for approval at the next meeting in accordance with the discussion on the Federal Advisory Committee Act.

Core Team

The group agreed the Environmental Protection ID Team narrative is the sample by which the other reports should be revised. Jack has reviewed three of the ID Team narrative reports and reported they are in good shape. He will work with Phil Williams on the Lab Safety report since it is so extensive.

ACTION: Group to review Environmental Protection Narrative report and submit suggestions to Ron Pauer

Two outstanding issues were raised to the group. One issues is the interpretation of PL104-113 - a law which is intended to change the government procurement specifications so they are in alignment with industry specs (i.e. avoid taxpayer dollars being spent on exorbitant prices for nuts and bolts and other ordinary items). DOE has required its procurement contracts include language that voluntary consensus standards be met by the contractor, so DOE needs to assure they are proceeding as required. DOE members of N&S suggested this language be added to the contract or to the final report and signed by Dr. Shank and Dr. Turner. Concern was expressed about adding this language to a contract mod for Contract 98 since this is a M&O contract and would unnecessarily add vague requirements without implementing the intent of the law. Dick Nolan and Phil Roebuck will check with Dean Decker to resolve the matter.

The second issue was to revisit the standards DOE has to follow (e.g. NEPA and some executive orders). It was agreed that these should be removed from the set to avoid misinterpretation that the Lab, not DOE, is responsible for the requirements.

ACTION: Ben Feinberg to alert Ron Pauer

Final Report

The group reviewed and agreed to the revised contents of and due dates for the N&S Final Report. Next week the approval of the report by the Approval Team will be discussed.

Contract Modification

There was discussion about the third category in the standard set - the Safety Management Standards to be determined upon ISM Plan completion - which had been agreed to on 9/18/96 by the group. The body of the revised contract agreement letter was approved and the enclosures are pending decision on the categories in the set.

Klaus and Jack each reported they have heard positive comments from researchers about the N&S standards set. They are looking forward to being able to look up an issue and find the standards themselves, not interpretations of standards, which they need to follow.

Stakeholders

The draft letter scheduled to go out 10/11 about the second Stakeholder meeting on 10/16 was approved with the suggestion that the website be referenced.

Issues from the Internal Review Team, the Confirmation Team and the Stakeholders

Ben outlined the process for ID Teams to enter new issues into the database with a source code so the disposition can be tracked and a summary can be written for the final report. The issues will be characterized as wholly implemented, partially implemented or not implemented. There was agreement to let the report represent the response since it will contain the summary for each group (Internal Review Team, Confirmation Team, Stakeholders) and the issue forms will be in the appendix to the report. Informally Dick and Phil and others have gotten back to the ESH Policy Committee on disposition. Ben will send email to the SRC on disposition of their issues.

Internal Review Team

Ben reported on the 9/20/96 SRC meeting on N&S. The response to the draft standards set was positive and there were specific questions on whether ANSI standards or Pub 3000 references should be cited. He noted even those who helped write Pub 3000, when it was needed because there were no other standards to go by, are now happy to replace it with existing standards.

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of October 2, 1996

Present:
LBNL: B. Feinberg, J. Bartley (telecon), K. Berkner; **UC:** H. Hatayama (telecon); **DOE/BSO:** D. Nolan, P. Roebuck; **DOE/OAK:** R. Kong,; **LLNL:** J. Johnson, D. Short (telecon)

Outstanding Issues

The group discussed the narrative and issues listing mailed to the Confirmation Team. DOE and the Lab are working to get consensus on standard or implementation guidelines questions. This should all be resolved by 12:00 today. The items being addressed by the Radiation group were resolved Monday morning. By Friday there will be no items in question by the Lab or DOE.

Narrative sections: TEID returned a version of the section. Some of the narratives have extensive detail and some are more general. It was agreed that if it provides understanding then more detail is not necessary.

TLVs for chemical substances will be going into the standards. Section 14 of the I.D. form will quote the caveat from the TLV manual regarding how they are to be used and not used.

It was noted that rather than list several references, such as the asbestos listing of Clean Air Act, OSHA, etc., only the appropriate sections of each should be used. The list going into the contract will be ordered in an inverse manner ordered by rolled up standards. The issues will be listed next to each standard. For example, CCR Title 8 CA Construction Safety will have "for construction only."

Confirmation Team

The agenda for the 2-day meeting was discussed and revisions will be made for Klaus Berkner's presentation time. Berkner will provide an introductory description of the Laboratory and the Berkeley Lab expectations after WSS. The DOE management representative will be Marty Domagala or James M. Turner. The Confirmation Team meeting reception cuisine was discussed and agreement was reached that the menu would be similar to the Stakeholders' meeting, and would include only a variety of sodas.

ACTION: Revise Confirmation Team Meeting Agenda.

It was noted that Dr. McKinney of National Institute of Health has canceled his attendance at the Confirmation Team meeting due to personal problems. Jack Bartley will attempt to secure a replacement.

ACTION: Jack Bartley will get a replacement for bio hazards if possible.

I.D. forms will be available for the Confirmation Team.

The group reviewed the signature pages for the Confirmation Team and agreed to have individual signature pages with affiliations included.

ACTION: Prepare Confirmation Team Signature Page.

ACTION: Prepare all other material on Friday for Monday's meeting.

Minutes

The minutes of the September 25, 1996 meeting were reviewed. It was noted that issue forms for items raised by the Confirmation Team were entered into the database. NEPA was removed from the set to avoid misinterpretation. The question was raised of whether anyone used the library sites, but there is no way of tracking the usage of these resources.

The minutes were approved.

ACTION: Make sure all issues are in before Friday.

Currents Article

Ben suggested a phone interview with Ron Kolb for the Currents article. It was also suggested that photographs and an article during the Confirmation Team meeting would be a viable alternative.

ACTION: Check with Ron Kolb re: Currents article.

Team Meetings

It was suggested that the presence of management people at some meetings impedes the process by stifling independent judgment. The group agreed that the meetings are not to represent management but provide a chance to present the best professional judgment possible. It was agreed that if people feel management is driving the meetings, then people do not own it.

Some people on the team felt that we weren't obtaining consensus. Ben emphasized to the Core Team that we must have consensus where each individual feels they can accept the team decision.

Final Report

The Final Report will include a list of issues and standards, as well as the ordered list of standards for the Contract.

ACTION: Ben Feinberg to complete Final Report introduction.

ACTION: Remove the word draft from the Web charter and team member list.

The group discussed moving EH&S Management Orders from Section 1 and to Section 3 but decided nothing should be in Section 3 at this time. The group agreed that the ID Teams address ES&H and they have the flexibility to include ES&H portions of the management orders if appropriate. It was suggested that a subsection be created in Section 1 relating to those management orders to be reviewed and highlighted. The suggestion was rejected to keep the Contract Appendix clean. Until safety management systems are developed, the Contract is our agreement. A section in the report should indicate that management orders will be reconsidered as we put our safety integration plan together. A new ID team will keep working on the safety integration plan and when it is developed it was suggested we go back and see how this affects Management Orders. Letting people know we recognize Management Orders complaints and are going to deal with them was discussed. Prescriptive orders will likely disappear as WSS is approved.

The Laboratory position is that the integrated safety system is the only way to go.

Los Alamos integrated safety plan is available for review October 15.

The group found around a dozen management orders. Some of the orders will have to be split, such as safety of accelerators order and fire protection. Ben will review this and James Chwang will work with this. The suggestion was made to make sure all orders are relevant.

ACTION: Ben and James Chwang will review split ordinances.

Other than narratives, only minor changes will be made on the other issues. The first draft of the report will be October 23 and the major work will be done the week of October 21.

The role of departments standards committee was raised. It will monitor progress and does not need to approve our report. Ben Feinberg will have Jack Bartley help in compiling summaries of what has been done on the issues raised by our review teams.

ACTION: Compile summaries.

The group discussed whether all safety policy and DOE safety policy concerns been addressed properly. Concerns have been given to the teams and Ben will check on their progress. The teams feel they have checked the safety policy concerns and resolved them. Verbal feedback is to be given for the Safety Policy Committee by Phil Roebuck.

The Convened Group signature page will be moved to page two of the report. It was discussed and agreed that all members of the ID teams should sign the document as well.

ACTION: Develop signature pages for Convened Group and ID Teams.

ACTION: Ben will check with teams on DOE Safety Policy Committee concerns resolution.

Stakeholders

Ben has two videos from Ron Pauer on the subject of dealing with the community. The group will review the tapes before the October 16 Stakeholders' meeting. To be presented are changes from the first set to our present position including, how the Lab will operate now, areas where we are voluntarily complying with the City of Berkeley standards and environmental issues. The entire audience should be brought up to date on where we were at the time of the first meeting and where we are now. The group suggested going back to the flow sheet from the first Stakeholders' meeting and show how the process evolved to the present set.

A dress rehearsal was suggested for Tuesday, October 15 at 4:00 p.m.. A consultant from Kaiser Engineers was utilized at the last dress rehearsal. Ben will attempt to get this person again. This will provide someone who can help determine the consistency of the message the Laboratory is projecting.

ACTION: Ben will try to get Kaiser Engineers' consultant for dress rehearsal.

Issues

There is some concern by the Stakeholders on dealing with Tritium. It was suggested we be sure we know what the Berkeley ordinance is and how to voluntarily deal with it. The group must be very clear about our commitments. Some things will be voluntarily adopted and others will not because they are adequately covered by other standards and need not be adopted.

ACTION: Ben Feinberg will talk to Nancy Shepard tomorrow and go over the Berkeley ordinances.

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of October 9, 1996

Present:
LBNL: J. Bartley, K. Berkner; D. McGraw, P. Williams **UC:** H. Hatayama; **DOE/BSO:** P. Roebuck; **DOE/OAK:** C. Simkins (telecon) **DOE/OAK:** D. Nelson (telecon) **FNL:** L. Coulson (telecon) **LLNL:** J. Sims (telecon)

Outstanding Issues from Confirmation Team Meeting

The Group discussed the October 7-8 Confirmation Team Meeting, and the difficulty encountered with the signature forms because of the interpretations of the word "feasible." Although some team members had no problem with the word "feasible", and penciled it in, none of the DOE Team members added "feasible." All members signed the revised signature forms. In the end, the Team signed off on the process as well as the set of standards.

It was stated that the law is the law whether it is feasible or not and the lesson learned is that the words in the guidance from the DSC are not appropriate.

The Confirmation Team had a problem separating implementation from the fact that they were here to confirm the identification of requirements to address the hazards at the Lab and not to provide advice on the implementation of means to mitigate specific hazards. It was suggested the public may identify caveats expressed by the Confirmation Team and have questions. Bartley will take all caveats back to teams for resolution and get new final signature sheets taking off contingencies.

> **ACTION: Jack Bartley will get new final signature sheets for the Confirmation Team and take off the contingencies.**

The laboratory personnel kept things in perspective during the Confirmation Team Meeting. Opening discussion on the signature page proved beneficial and having administrative support available proved helpful for revision of the signature sheets.

The Confirmation Team went through the conversion process, starting from the opposite end of the spectrum with a classic perspective, then moved forward in recognizing the process and their objective.

The group discussed the pressures of seeking cultural change and making it work. It was suggested that industry representatives were most helpful since they intuitively started with work and associated hazards. Industry team members have lived with, understand, and have an intuitive grasp of the standards. The possibility of considering a majority of industry people on future teams was discussed. It was recommended that any site when doing WSS process should be careful in Team selection. The members should be reminded frequently to link the standards to a specific hazard.

It was also suggested that the Lab needs to learn by comparing with larger, experienced audiences. DOE people do not have the experience and there may be a conflict of interest because of their dual DOE role.

It was stated that the Lab is trying to change the culture and does not need DOE Orders. Some of the other Labs are not sure they want this responsibility. Argonne's pilot OSHA program may qualify for authorization to regulate themselves.

The group discussed the fact that many regulators think of the Labs as resources rather than something to regulate. They may even see the Labs as threats to their organizations. Laboratory EH&S professionals were at the same level as the experts acquired for the Team. The Lab now is more confident that it can live in the external world, which is a giant step. There will be no huge learning curve.

The on-going progression will not require the resources of the initial project, and a smaller working groups will be used for institutionalized regulation follow up. The group was advised another Lab followed-up with letters to the Lab personnel and DOE for review of existing standards and received very rewarding feedback. The resource intensity will be in tracking any changes to the standards. However, we should be able to pool some resources with other University Labs.

The group noted that the hazard database and Chapter 6 of Pub 3000 are great tools. Jack Bartley has asked that the chapter be shifted around to capture functional changes. In terms of institutionalizing the WSS process, the Lab and University should sign off on a routine annual basis. McGraw stated that the existing schematic based on Chapter 6 should go into the integrated ES & H management plan.

Close interaction with the ID Teams produced a daily close out on the progress. Working through WSS has advanced the radiation protection area compliance process. Those responsible are now requesting help instead of taking a compliance attitude.

Core Team

The group stated that the issue documents need to be completed for the next stakeholders' meeting, October 16, 1996.

ACTION: Jack Bartley will discuss this with Ben and prepare documents.

Stakeholders

The narrative was discussed and it was decided that it does not track with the list of standards. The stakeholders letter was reviewed and will be mailed with the peer-reviewed standard set from Jack Bartley.

ACTION: Jack and Ben will pull together the introduction at the next meeting.

ACTION: Jackie will mail stakeholders letters when peer-reviewed standard set received.

The group felt that there was no need to walk through the standards at the meeting, but rather that Ben should concentrate on the central core theme and keep repeating it. They will review the last stakeholders' meeting material. The message from the Confirmation Team is that we are doing more than industry standards, and cover more than radiation. The standards are being identified. We

should give statements up front to address our voluntary compliance, letting stakeholders know we have selected standards and have mechanisms in place for compliance.

It was decided that for any questions on enforcement of standards, focus on our checks and balances. DOE is responsible for checks and balances, and performance requirements. To set the stage for responsible management systems to implement the standards set, we intend to use exiting checks and balances to ensure that safety is not compromised. This oversight exists at several different levels: Lab, contractual, and level independent of contract. Dick Nolan should be the first presenter and can give concepts with available material to show different levels of checks and balances. He can acknowledge that DOE is here to answer questions and assure that regulatory oversight will continue.

ACTION: Have Dick Nolan speak on checks and balances, then introduce Ben to discuss process, reviews and standards.

Issues from Confirmation Team

The voluntary reporting to the city was discussed. It was decided that since it is voluntary, those City ordinances cannot logically be a part of the standards set. Furthermore, in the context of logic tree used to select standards, there is no value added to the level of safety by City ordinances, hence, they should not be included as a requirement but put in implementation.

DSC Meeting Review

T. O'Toole wants worker involvement on Confirmation and ID Teams. The Confirmation Team is to have experts and be independent. O'Toole is going to make sure worker involvement and learning process occurs, and that organizations don't become dependent on pre-existing documents. The group stated we are okay on this. Jack Sims will put together a model on this, and the next DSC meeting will reassess where DSC is in respect to charters and goals.

The group stated that the process was designed to get involvement of researchers, research technical staff, and crafts people in the shops. In addition, union shop stewards were invited as stakeholders but did not attend the first meeting. O'Toole included LBNL with other Labs. She does not think of PI's as workers. The group stated workers have highest incidence of accidents, not PI's and we want worker and researcher involvement as we go forward with the integrated ES & H management plan. Various models of WSS standards will be presented at the next DSC meeting to remind everyone of the importance of worker involvement, and production issues will be reported first.

There was a discussion of whether comments are being driven by in-fighting amongst fractions within ER and that the possibility of external oversight replacing DOE's role have caused some tensions. The tension within the Los Alamos ER Operations is attributed to the fear that they might get swamped by other segments of DOE. The bigger concern is that problems at LANL will dictate the contract.

It was suggested that determination of the success for this process should be easy because the set is no longer dealing with a system (DOE Orders) that filters, interprets, and adds to external requirements. With WSS, what you see is what you get. Gaining success in cultural change can be hard to measure because there will be bounding jumps followed by lots of fall back. The overall advance will be very subtle.

Lab responsibilities for subcontractors were discussed. It was decided that if we require subcontractors to meet certain standards we become liable for their understanding and implementation as well as follow up. Subcontractors should be required to follow CAL OSHA. The liability for subcontractors is a concern because two people working in the same room can be under two sets of safety standards.

Final Report

The group reviewed the Convened Group and ID Teams signature pages. It was suggested that "necessary and sufficient for adequate ES&H performance" be added to the pages but the group decided this was not necessary. Linking hazards and work to requirements should be all that is necessary for signatures. It was agreed that the Convened Group and ID Team statements on the signature pages should be different. Jack Bartley will check the charge to the identification teams in the charter for the wording.

ACTION: Jack Bartley will get signature statements from the charter wording and distribute for review.

The WSS schedule is on track.

DOE Summary of Comments

Phil Roebuck discussed his write up of the "Summary of Comments from the ES&H Policy Committee of the DOE Oakland Operations Office" with the group.

Minutes

It was decided that the currents article will be done after the final approval of the set by Shank and Turner. Ben will talk to Nancy Shepard regarding voluntary items (Berkeley ordinances).

McGraw's office will present the implementation plan for approval to DOE and the Office of the President.

Management Directives -- Ben and James Chwang will work together to split out the management piece in the Accelerator Order to add to the existing list. Juetten and Copenhaver reviewed the list and are comfortable with it. McGraw suggested keeping in mind that within a year from now, if the project meets requirements and approval, the management orders will go away. Since the integrated management system will not automatically remove orders, the group should identify the process and the necessary steps for replacing the management orders with standards for the integrated ES & H management system.

At the last activity team meetings, all issues were resolved.

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of October 23, 1996

Present:
LBNL: J. Bartley, B Feinberg, D. McGraw **UC:** H. Hatayama (telecon); **DOE/BSO:** D. Nolan, P. Roebuck; **DOE/OAK:** D. Nelson (telecon)

STAKEHOLDERS 10/16/96 MEETING

Stakeholders were informed the Lab is following ordinances voluntarily as well as meeting the legally required ordinances. There was a discussion regarding radiation emissions and this issue will be the topic of a meeting today.

The stakeholders asked for an extension to allow them to present the standards set to CEAC for their response. The Convened Group met and agreed to extend the request for stakeholders' comments to 11/6/96. The group also agreed to send the standard set to more stakeholders with the revised date.

There have been no comments received from stakeholders other than a note received from Ray Schwartz regarding offsite transportation.

FINAL REPORT

The group suggested that the final report be sent to TEID 11/1/96 and the contract modifications be sent to the contracting officer through Howard Hatayama. Howard has been receiving contract sections electronically, but he will probably not receive the final version until 11/13/96.

> **ACTION: Phil Roebuck will discuss the contract modifications with Rona Promani to verify the submittal process.**

After a discussion of the procedure for handling comments received after the signature pages are signed, it was agreed that the I.D. teams involved will sign the changed set, and the Convened Group can initial minor changes.

MANAGEMENT ORDERS

The Management Orders to be added to the contract per Turner's letter of 10/16/96 were reviewed.

Ben will create a new Appendix G with three categories after he receives information from Joanne Lorence and Don.

> **ACTION: Ben will have Joanne Lorence and Don identify and replace sections of the 5500 series with relevant sections of 151.1.**
> **Phil will provide the relevant sections (from Ralph Kopenhaver) on Occupational Medicine from 440.1.**

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of October 30, 1996

Present:
LBNL: J. Bartley, B Feinberg, D. McGraw, P. Williams **UC:** Ken Groves ; **DOE/BSO:** D. Nolan, P. Roebuck; **FNL:** L. Coulson (telecon)

CONTRACT

After review of the inverse standards list, it was decided the right hand side will not go into the contract but will be in the final report document to indicate all is covered. Inclusion of the entire list in the contract may prove to be confusing. Jack stated he sorted the issues list differently to be more consistent and make tracking easier. It was suggested that a statement be made that only the standards list (left side of submitted list) will go in the contract.

Nancy Shepard is to be considered an expert rather than a team member. This is a confidentiality issue.

It was also suggested that the preamble include a statement that it is the Lab's intent to comply with all laws and regulations and adopt certain standards by reference to guide us in performance.

For the contract, the Federal, state and local codes need to be in order as references to provide ease in tracking. To avoid frequent modifications to the contract, it was suggested that references be made to "applicable sections" rather than specifying each section. The exception will be the standards in a sufficient category, and those sections will be defined.

Ben recommended reordering the standards list leaving in the detail and creating another rolled up list. He will consult with Ron. The target is to have the rolled up list stand the test of legal issues and to find a balance.

Jack stated the electrical and fire safety standards will need the narrative portion of the list to demonstrate how they are being used.

INTEGRATED MANAGEMENT PLANS

McGraw has started mapping out a process for follow-up and will be comparing current systems in place at Berkeley Lab with ISMS principles and rubrics. He can bring examples of the plan to the next meeting if necessary. It was suggested that the Group continue with the subset team formation for the follow-up approach. Jack is considering Kotowski and Tudor along with DOE members in an effort to initiate a team now.

Composition of a cover letter to go with the process expressing that Berkeley Lab and DOE are working together, should be the first order delineating where we are going. The principles or objectives should be noted and existing systems and DOE orders in place should be covered.

ACTION: McGraw will have his staff draft a cover letter.

Ben stated that implementation will require revisions to, and may require splitting of Pub 3000.

McGraw stated that he plans to have an offsite staff meeting to discuss the possible changes EH&S teams will incur as part of the implementation process. Possible changes include physical relocation of EH&S staff members and shared management of EH&S staff with the research community. Because of the extensive preparation necessary, this meeting will be scheduled for January or February, 1997.

The integration and accountability of researchers will prevent the possibility of the guidelines being used to dictate research processes.

The Group was asked to help in defining teams for Lab operations and research divisions. EH&S can participate in new programs and pilot the implementation by using models such as ALS and the 88." Teams could be set at the same time as the press release. It was suggested that the pilot program include one accelerator facility and another division such as Life Sciences, or specifically, the Human Genome Center. The ALS Memorandum of Understanding was sited as an example of an effective collaboration tool.

The Group discussed the need for something formal to eliminate confusion between use of the old or new standards and decided there was a need for interim guidelines until Pub 3000 is revised. McGraw stated Suzanne Stroh is working on Pub 3000 and an announcement is going out that this is a new set of standards. Only twelve hard copies of Pub 3000 are distributed now, and next year there will be only electronic versions. Chapter six, Hazard Assessment, will be rewritten.

Current practices and procedures will change very little as we work with people who are actually doing the work. There may be some changes initiated after going over Pub 3000 with the electrical safety professionals. Flexibility should be exercised. Teams are to follow the standards rather than the systems in place if it impedes the work. EH&S can authorize use of intent of the standard rather than the system. EH&S teams will be the local authority. The ground must be prepared to get a clear understanding of the responsibility of the divisions and the EH&S teams. McGraw's offsite meeting will prepare EH&S teams.

It was felt we should appraise ourselves using the pilot programs as a necessary vehicle for self-assessment.

FINAL REPORT - DRAFT INTRODUCTION

The Group reviewed the draft introduction. After discussion of the group's concerns, it was decided to redraft item #1 and #2 to reflect minor changes. Suggested changes to item #1 included omission of the phrase "in general," clarification of "applicable" and the use of Berkeley Lab rather than "DOE facilities." It was also suggested that a preemptive statement be added to include "necessary and sufficient." in item #1. Possible changes to item #2 included suggestions to use wording such as "Necessary legally applicable standards are drawn from Federal, State and local regulations." Also noted was that the phrase "beyond compliance" should be included in item #2. The lasts two sentences of item #3 were considered and will remain in the document.

ACTION: Ben will check with Nancy Shepard regarding the phrase "in general" in item #1.

In the last sentence of page one, paragraph two a suggestion was made to change this statement to "Extended comment period for stakeholders to November 6."

Replacement of the Management Orders was discussed and it was concluded that some of the orders will be deleted. McGraw noted that ISMS principles and rubrics will be in the contract and suggested using a comparison process.

Removal of the replacement statement in the first paragraph of page two was suggested. Jack will work on a revision. The reference to Appendix G on page two of the draft introduction should be omitted since "contract" is all that is needed.

Status of the tables indicating what was done with the issues and narratives was mentioned. Ben will check the tables. Jack stated that Ben only needs to complete tables for the Safety and Confirmation Teams.

ACTION: Ben will set up tables for the Safety and Confirmation Teams.

Ben and Jack will work on changes to the draft introduction.

ACTION: Schedule meeting for November 6 to review total report.

ACTION: Review Stakeholders comments on November 8 and prepare to give report to Dr. Shank and James Turner on November 11.

Nolan and Roebuck plan to meet with James Turner for a final report briefing on November 8.

Nolan stated that Deputy Curtis may want to be at the final report signing event on November 13. He will follow-up on this and notify the group. Ron Kolb is to be involved if Curtis can attend. Groves will arrange for someone from the Office of the President to attend. It was also suggested that there be a joint press release by DOE and the Laboratory.

STAKEHOLDERS

Ben has been in touch with the chair of the Stakeholders group and stated we should receive comments from them through November 6.

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of November 6, 1996

Present:
LBNL: J. Bartley, K. Berkner, B Feinberg, P. Williams; **UC:** H. Hatayama ; **DOE/BSO:** D. Nolan, P. Roebuck; **DOE/OAK:** C. Simkins; **LLNL:** J. Sims.

MINUTES

The Group reviewed the minutes of 10/30/96, agreed the first sentence under "Contract" was unclear, and requested removal of this sentence.

Ben presented the revised inverse standards and issues list for review. He stated the necessary standards were rolled up but the sufficient standards were not. There will be only one list in the Contract and three lists in the report. After discussion, it was decided that Ben would update the set for consistency and add information to the radio frequency issue.

ACTION: Ben will update sets to ensure consistency.

It was suggested that a tracking system be put in place and an annual review. As work changes the standards will change and this will require periodic revisions. It was decided that subject matter experts are tracking now and the annual update should be just a rollup. Nolan stated he is working on a partnership process that should keep the project on track.

Discussed the use of systems to acquire code changes to keep issues updated. The possibility of subscribing to a system for code changes was suggested.

The group agreed that they need one or two more meetings to review the looking forward procedure. They also discussed the sensitivity of inverse issues items.

FINAL REPORT

The final report signing meeting will be 11/13, 9:00 a.m. in Dr. Shank's office. Deputy Curtis will not attend. Charlie Billups is not sure Krebs or Decker can attend, but Charlie plans to attend if they are not available.

The revised introduction was presented. Review of the introduction revealed concerns regarding the chronological order of events and some changes were suggested. After discussion, the Group agreed that a prologue is needed. This document and the revised introduction will be presented at the 11/8, 10:00 a.m. meeting of the Group. It was suggested that the Tritium Lab report might be a guide for preparation of this prologue. The documents should describe steps for people not familiar with the process, similar to a narrative table of contents linked to DOE 450.

ACTION: Phil Roebuck and Phil Williams will create prologue.

These documents will provide information on the necessity of implementing this process and a roadmap leading to the location of relevant information in the report.

ACTION: Ben will revise introduction to act as roadmap.

The report binders will be changed from Volume I & II, to Report and Supplement to the Report. The Report binder will be distributed but the Supplement binder will be available only on request and will not be on the Web at this time. Fifty copies of the Report and fifteen of the Supplement will be produced by TEID. Distribution list for the Report:

- Convened Group Members
- Charles Shank
- James Turner
- Howard Hatayama - extra copy for distribution to Los Alamos
- Phil Roebuck - 3 extra copies for DOE distribution
- Tara O'Toole
- Maggie Sturdivant
- Martha Krebs

LBNL will be judged on adherence to the manual with checks on justification and implementation. Jack Sims suggested a meeting to discuss IFM process plans for LLNL and LBNL. Hatayama will discuss this with Sims. It was stated that McGraw and his counterparts are exchanging information on management orders and the contract.

The issues table was discussed although the narratives have not been prepared. After a discussion of the implementation process, it was felt the use of disposition would be the correct terminology. It was stated that some issues only required discussion and did not impact the set, therefore, there would be no implementation.

ACTION: Ben will edit the issues table to make it more consistent and complete any questions.

The comments will be in the appendices as ID team documents.

The use of the issues table without narratives was discussed. It was suggested that the table include references to sections in the appendix rather than a narrative summary. The table will include:

- Date
- Source
- Issue
- Disposition
- Reference number

There was no discussion of integrated management plans. However, a rough framework on where we are going is needed. DOE will need an overview of how process regarding orders will work and a schedule. Jack will assist with this.

ACTION: Jack will provide a draft roadmap for DOE.

STAKEHOLDERS

Stakeholders comments are due today and will be discussed on Friday. Laboratory comments, though not officially a part of the process, will be included as stakeholder comments.

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of November 8, 1996

Present:
LBNL: J. Bartley, B Feinberg, P. Williams; **UC:** H. Hatayama ; **DOE/BSO:** P. Roebuck; **DOE/OAK:** C. Simkins; **LLNL:** J. Sims, D. Short

N&S Requirements

The group discussed the DOE requirements and agreed we have met them all.

Integrated Management Plan

ACTION: Jack to give 1-page Brief to Dick Nolan

ACTION: Dick Nolan to give 1-page brief to Dr. Turner on Tues. 11/12.

Final Report

The group reviewed the sections of the report as shown in the Implementation and Following document, and discussed the sequence of the sections. Decisions were made on how each section will refer to other sections so the report is logical to the reader.

There was a discussion of the Introduction and Prologue. It was agreed the Prologue will assist DOE and the public in understanding what we've done. The group agreed on several changes to the draft.

Implementation Section: The group reviewed a draft of the LBNL N&S implementation and following.

ACTION: Ben will make revisions and get them to TEID

ACTION: Ben will revise the Issues Tables

Stakeholders

The group reviewed the stakeholder issues in detail. Ben, Phil and Jack also had a separate meeting in advance of this meeting. Ben also met with Klaus to go over them.

After a detailed discussion of hazardous waste transportation management, it was noted that more information was needed.

ACTION: Jack will check with Michelle

Implementation

Jack stated EH&S will make an annual WSS report (to replace DOE O 231.1 annual report) available to the public and employees upon request.

Approval of the Set & Final Report

Ben will meet with Ron Kolb regarding the press release and go over the N&S process, the purpose of it, and the comprehensiveness of the Set.

ACTION: Cynthia will arrange next Wednesday's (11/13) meeting to start at 10:00 a.m. for approximately one hour for review of concerns compiled by Phil Roebuck.

LBNL Necessary & Sufficient Initiative Process
CONVENED GROUP MEETING

Minutes for meeting of November 13, 1996

Present:
LBNL: B Feinberg, P. Williams; **LLNL:** J. Sims

Minutes

The minutes of November 8, 1996 were reviewed. Ben stated the issues tables cited in the minutes were included in the final report.

The minutes were approved.

Issues

Fifteen stakeholder and approximately twelve Laboratory comments were received. ID forms for these issues will be generated and included in the supplement to the report.

Phil Roebuck was not available for discussion of his concerns.

Another meeting of the Laboratory and site office will be scheduled to review Phil Roebuck's concerns regarding the Lab's on-going implementation, procedures for reviewing, changing, and making modifications to the contract. It was stated that Coulson and Tim Miller of FNAL and NTS have experience in this area.

Jack Sims discussed the probability of a delayed formal presentation to DSC.

ACTION: Phil Roebuck will schedule a meeting for review of his concerns.

Final Report

The final report was approved and signed today. It was suggested that copies of the final report be sent to Division Directors with an introductory letter.

ACTION: Ben will work with Bartley and McGraw to develop a final report letter for Division Directors.

Stakeholders

Ben discussed the five stakeholder letters received with Ron Kolb. Ron suggested we send a personal letter of response thanking the stakeholders for their input and giving appropriate responses to their concerns. The group decided to send a copy of the report to the five who sent letters. Ben stated there were three people at the stakeholders meeting who requested information, and suggested that reports be sent as a response to their questions.

It was suggested that a letter of thanks be sent to all participants in the process with the notation that a copy of the final report and the supplement will be in the reading rooms.

ACTION: Ben to create a letter to all the process participants.

ACTION: Cynthia will send copies of the final report and supplement to the reading rooms.

Correspondence

July 11, 1996
DIR-96-220

Mr. Brit Johnson
City of Oakland
Hazards Control
505 - 14th Street, Suite 702
Oakland, CA 94612

Dear Mr. Johnson:

Enclosed please find a copy of a letter sent from the Berkeley Laboratory to several organizations the Lab considers stakeholders. It describes a new, rigorous process for work and hazard review, as well as subsequent standards identification in Environment, Safety and Health.

It is the Laboratory's goal to reach out to all stakeholders. In that spirit I would ask you to review the enclosed stakeholders mailing list for completeness. If you would like to suggest invitations beyond this list please call me at (510) 486-5551 or contact me through e-mail at DCMcGraw@lbl.gov.

Sincerely,

David McGraw, Division Director
Environment, Health and Safety Division

DCM:fg

Enclosure

c: K. Berkner
B. Feinberg
R. Nolan, DOE/BSO
C. Tilden

July 11, 1996
DIR-96-222

Ms. Janice Thomas
Community Environmental
Advisory Commission
37 Mosswood Road
Berkeley, CA 94704

Dear Ms. Thomas:

Enclosed please find a copy of a letter sent from the Berkeley Laboratory to several organizations the Lab considers stakeholders. It describes a new, rigorous process for work and hazard review, as well as subsequent standards identification in Environment, Safety and Health.

It is the Laboratory's goal to reach out to all stakeholders. In that spirit I would ask you to review the enclosed stakeholders mailing list for completeness. If you would like to suggest invitations beyond this list please call me at (510) 486-5551 or contact me through e-mail at DCMcGraw@lbl.gov.

Sincerely,

David McGraw, Division Director
Environment, Health and Safety Division

DCM:fg

Enclosure

c: K. Berkner
B. Feinberg
R. Nolan, DOE/BSO
C. Tilden
K. Berkner

Lawrence Berkeley National Laboratory
1 Cyclotron Road
Berkeley, CA 94720

July 9, 1996
DIR-96-217

«FirstName» «LastName»
«Address1»
«Address2»
«Address3»
«CityState» «Zip»

To: «FirstName» «LastName»

Subject: Selection of the Ernest Orlando Lawrence Berkeley National Laboratory as a participant in the Department of Energy's Work Smart Standards Program (Necessary & Sufficient Standards Closure Process)

We are inviting you to participate in a new era in Department of Energy (DOE) Environment, Safety & Health (ES&H) management. You are being invited because the laboratory considers you a Stakeholder; an individual or organization with vital interest in assuring successful ES&H management of the Laboratory.

The DOE is converting from compliance-driven ES&H activities to standards-based management, what the DOE is calling Work Smart Standards Based Management. The DOE Assistant Secretary for ES&H has specific goals for this change, including:

- enhancement of public and worker safety;
- building of public trust and confidence;
- development of reference points for measuring excellence;
- easier and more effective planning and implementation of work practices; and
- improvements in efficiency.

The performance objective of the DOE Work Smart Standards Based program is the development and use of ES&H standards to ensure that work is planned, performed, and documented as meeting standards for protecting the environment and the safety and health of the public and workers. Achieving this objective should also:

- allow for good judgment in planning work and allocating resources;
- create consistency and stability in expectations and accountability;
- maintain protection, while establishing a balance between costs and benefits;
- permit judgment to be exercised at the appropriate decision level;
- increase the effectiveness of work; and
- allow for bench-marking against best Industry practice.

The Work Smart Standards Based Management concept was initially tested by several focused pilot programs, including a pilot at the Berkeley Lab's National Tritium Labeling Facility (NTLF). Based on the success of the NTLF pilot, the Energy Research (ER) Program in DOE has asked the Berkeley Lab to be the first multi-program Lab in DOE to take the approach site-wide. What this means is that the Berkeley Lab has been given an opportunity to review the ES&H standards under which it operates. In particular, we have been charged with selecting a necessary and sufficient set of reference standards to provide for worker and public safety, and for a responsible and

environmentally sound operation. The initiative scope directs the Laboratory to review and select standards for measuring ES&H excellence based on existing Federal, State and local laws, and where applicable, internationally recognized standards. These standards may include those not codified in law or regulation, but represent the highest operating standards of industrial and commercial institutions. For example, the Berkeley Laboratory plans to review the ES&H operating standards of the other private and public research institutions conducting similar operations.

Since Work Smart Standards Based Management is based on existing laws and regulations as reference points to measure ES&H performance, we do not expect the resultant set of operating standards developed for the Berkeley Lab to affect either compliance with regulations or your relationship with the Laboratory. To ensure that this objective is met to your satisfaction and to understand and address any concerns you might have about the process, **you are invited to a Stakeholder meeting at the Laboratory in the Building 90-3148 conference room on Wednesday, July 31, at 6:30 p.m.** Those of you who cannot attend this meeting will receive summaries of the proceedings upon request. At the meeting, a short history of ES&H oversight within DOE and at the Berkeley Lab will be presented, followed by a short introduction to the DOE Standards-Based ES&H Program, the Process for selecting a Necessary & Sufficient Set of Standards, and a status report on the implementation of this initiative at the Berkeley Lab. For your information, representatives from the agencies and communities listed below are being invited to the Stakeholder meeting:

University of California Office of the President
United States Department of Energy
City of Berkeley
City of Oakland
County of Alameda
Bay Area Air Quality Management District
San Francisco Bay Regional Water Quality Control Board
East Bay Municipal Utility District
State of California Department of Toxic Substances Control
State of California Department of Health Services — Environmental Management Branch
State of California Department of Health Services — Radiological Health Branch
United States Environmental Protection Agency — Region IX Air and Toxics Division
United States Nuclear Regulatory Commission
University Professional and Technical Employees

Dr. Ben Feinberg, a senior scientist at the Laboratory, is the Process Leader for the Necessary and Sufficient Standards Closure Process at the Berkeley Laboratory. He is assisted by Dr. Jack Bartley, the Environment, Health & Safety Division Deputy Director. Dr. Feinberg can be reached at (510) 486-7725 (phone), (510) 486-4960 (Fax) or B_Feinberg@lbl.gov (email) and Dr. Bartley can be reached at (510) 486-4191 (phone), (510) 486-7488 (Fax) or JCBartley@lbl.gov (email). The Laboratory looks forward to hearing your views on this important Department of Energy and Berkeley Laboratory initiative.

David C. McGraw
Director
Environment Health and Safety Division
Lawrence Berkeley Laboratory

Richard H. Nolan
Director
Berkeley Site Office
U.S. Department of Energy

c: K. Berkner
J. Bartley
M. Domagala, DOE/OAK
B. Feinberg
P. Hill, DOE/OAK
J. Keen, City of Berkeley
P. Roebuck, DOE/BSO
C. Shank
C. Tilden
J. Turner, DOE/HQ
P. Williams

Lawrence Berkeley National Laboratory
1 Cyclotron Road
Berkeley, CA 94720

August 9, 1996

James Turner
U.S. Dept. of Energy
Acting Mgr., Oakland Operations Ofc.
1301 Clay Street, Ste. 700N
Oakland, CA 94612-5208

Dear James Turner:

Subject: Summary of Stakeholder Meeting, July 31, 1996

The first Stakeholder Meeting was held July 31, 1996, to present a summary of the DOE Work Smart Standards Program (Necessary & Sufficient Standards Closure Process). The performance objective of the DOE Work Smart Standards Based program is the development and use of ES&H standards to ensure that work is planned, performed, and documented to assure protection of the public, employees and the environment.

The Berkeley Lab has been given an opportunity to review and select necessary and sufficient standards to address the Lab's work using existing Federal, State and local laws, and where applicable, internationally recognized standards. These standards may include those not codified in law or regulation, but represent the highest operating standards of industrial and commercial institutions.

An outline of the meeting discussion is enclosed for your review. It contains a schedule for Stakeholder involvement. A reading room will be available to you as the project progresses to ensure availability of the work hazards, draft standards and other information on the process. The second Stakeholder Meeting will be in mid-October so we may get your comments on the standard set. You will receive an announcement prior to the meeting date.

Dr. Ben Feinberg, a senior scientist at the Laboratory, is the Process Leader for the Necessary and Sufficient Standards Closure Process at the Berkeley Laboratory. He is assisted by Dr. Jack Bartley, the Environment, Health & Safety Division Deputy Director. Please feel free to contact them for further information. We appreciate your involvement in this process.

David C. McGraw
Director
Environment Health and Safety Division
Lawrence Berkeley Laboratory

Richard H. Nolan
Director
Berkeley Site Office
U.S. Department of Energy

August 14, 1996

Dear Confirmation Team Member:

Thank you for agreeing to participate in a new era in Department of Energy (DOE) Environment, Safety and Health (ES&H) management, as a participant in the confirmation process of a set of ES&H standards for the Lawrence Berkeley National Laboratory (LBNL). You were invited because of your recognized experience in establishing ES&H standards or the operation of similar facilities to those at Berkeley Lab. Although you are recognized as an expert in accelerator and fixed radiation sources, you have been invited and are expected to utilize your general experience in implementing or overseeing ES&H management systems to examine the standards identified as applicable to LBNL, not only in your functional area, but in all aspects of ES&H.

The DOE is converting from compliance-driven ES&H activities to standards-based program management. Previously the Berkeley Lab attempted to comply with one-size-fits-all DOE orders. Now the Laboratory is reviewing its work and the associated hazards, and identifying the appropriate consensus standards to ensure adequate protection of the workers, the public, and the environment. Goals for this change include: enhancement of public and worker safety, building public trust and confidence, development of reference points for measuring excellence, improvements in cost efficiency, and more effective planning and implementation of work practices.

To determine if you agree that the standards set allows us to operate the facility in a safe, efficient, and cost effective manner, and provides adequate protection to the staff, the public, and the environment, we request that you review and confirm the set of standards through the following process:

- Acquaint yourself with the Berkeley Lab, through a one- or two-day visit, if you desire.
- Review a summary of the information used by the Identification Team along with the Work Smart Standards Set (that we will send you) and comment, in a conference call and in writing.
- Spend a couple of days at the laboratory, challenging the Identification Team to defend the Standards.
- Confirm the set of standards as necessary and sufficient to provide adequate, cost effective protection.
- Confirm that the process used is in accord with the DOE requirements (which are enclosed).
- Confirm that implementation of the set of standards will be feasible.

At this time we would appreciate your suggestions regarding the type of information you may require, if any, in addition to that described above, to facilitate the process. Please respond to Ben Feinberg, Process Leader for the Necessary and Sufficient Standards Closure Process at LBNL. He may be reached at: (510) 486-7725 (Voice), (510) 486-4960 (Fax) or B_Feinberg@lbl.gov (E-mail).

Thank you very much.
Sincerely,

David McGraw, Director
EH&S Division, LBNL

Richard Nolan, Director
Berkeley Site Office, DOE

Ernest Orlando Lawrence Berkeley National Laboratory
One Cyclotron Road | Berkeley, Califonria 94720 | Tel: 510.486.4000

Draft Schedule and Details

Schedule:

Date (Week of ...)	Item
Open/Optional	Use form below for familiarization tour of Berkeley Lab if you desire a visit
September 2, 1996	Receive Berkeley process description
September 9, 1996	Receive draft Work Smart Standards set and rationale
September 16, 1996	Conference call with Convened Group (process steering committee) to identify concerns and ask questions
September 23, 1996	Comments due back to Convened Group
September 30, 1996	Receive revised Work Smart Standards set
October 7, 1996	Two-day visit to challenge Identification Team to defend standards and to confirm the Work Smart Standards

Financial Support:

A limited amount of financial support for travel expenses and consulting is available, especially for non-government or national laboratory confirmation team members. Please contact Ben Feinberg for further information.

Familiarization Visit Form (Fax to (510) 486-6060), Attn: Jackie McDonald

Name: _____

Address: _____

_____

_____

Telephone: _____

Fax: _____

E-Mail: _____

Desired Date of Visit: _____

Alternate Date of Visit: _____

Desired Length of Visit: _____

To Confirmation Team
Mailing Sample

September 11, 1996

Susan Spencer
EH&S Director
U.C. Berkeley, 327 Univ. Hall
Mail Code 1150
CAMPUS POUCH

Dear Susan Spencer:

We have confirmed plans to host a 2-day visit at Lawrence Berkeley National Laboratory starting the morning of October 7th through 8th and want to provide you with the information you'll need.

Rooms have been reserved at the Oakland Marriott City Center, 1001 Broadway, Oakland, CA (510) 451-4000, under the "LBNL Confirmation Team," with the Laboratory providing shuttle transportation between LBNL and the hotel. For your convenience, enclosed are directions to the hotel and a map of the area.

Non-Department of Energy personnel should phone the travel coordinator, Jacqueline Noble at (510) 486-4762 to make hotel and travel arrangements. Department of Energy personnel should arrange their travel as usual and contact the hotel directly for room reservations.

Please sign a travel expense voucher and leave it with the meeting administrator during your visit.

If you have any questions, please contact Ben Feinberg, Process Leader for the Necessary and Sufficient Standards Closure Process at LBNL. He may be reached at: (510) 486-7725 (Voice), (510) 486-4960 (Fax) or B_Feinberg@lbl.gov (E-mail). Thank you for participating in the confirmation process to develop a Work Smart set of ES&H standards for the Lawrence Berkeley National Laboratory (LBNL).

Sincerely,

David McGraw, Director
EH&S Division, LBNL

R. Nolan

Richard Nolan, Director
Berkeley Site Office, DOE

Ernest Orlando Lawrence Berkeley National Laboratory
One Cyclotron Road | Berkeley, California 94720 | Tel: 510.486.4000

September 16, 1996

Dear Lab Safety Review Committee Member:

This letter is to transmit the "Draft Standards Set" for your review in the internal review process of the N&S set of ES&H standards for the Berkeley Lab. This set will be discussed at Friday's SRC meeting. You may submit input at that time or through 9/23/96.

The enclosures include the draft standards set and introductory information on the criteria used during the process. Identification Team issue forms for specific issues, which include why standards are in the set and what implementation issues are anticipated, are available upon request.

As a reminder, our web site offers additional resources which you may find helpful. It is at URL http://www.lbl.gov/Workplace/NS-Program. If you have any questions, please contact Ben Feinberg, Process Leader for the Necessary and Sufficient Standards Closure Process at LBNL. He may be reached at: x7725 (Voice), x4960 (Fax) or B_Feinberg@lbl.gov (E-mail).

We are grateful for your involvement in this process, and thank you again for your participation.

Sincerely,

Ben Feinberg, Process Leader
Work Smart Standards Project
Head of Operations, ALS

Ernest Orlando Lawrence Berkeley National Laboratory
One Cyclotron Road | Berkeley, California 94720 | Tel: 510.486.4000

September 16, 1996

Dear Confirmation Team Member:

This letter is to transmit the "Draft Standards Set" for your review in the confirmation process of the set of ES&H standards for the Lawrence Berkeley National Laboratory (LBNL). A conference call for the Confirmation Team has been scheduled for Monday, 9/23/96 from 10 AM to Noon PDT. Please phone 1-800-403-1036, and when prompted enter the passcode number 416120. This forum is intended to address any questions or major issues you may have after reviewing the manual, Charter and the draft standard set.

The enclosures include the draft standards set and introductory information on the criteria used during the process. Identification Team issue forms for specific issues, which include why standards are in the set and what implementation issues are anticipated, are available upon request.

As a reminder, our web site offers additional resources which you may find helpful. It is at URL http://www.lbl.gov/Workplace/NS-Program. If you have any questions, please contact Ben Feinberg, Process Leader for the Necessary and Sufficient Standards Closure Process at LBNL. He may be reached at: (510) 486-7725 (Voice), (510) 486-4960 (Fax) or B_Feinberg@lbl.gov (E-mail).

We are grateful for your involvement in this process, and thank you again for your participation.

Sincerely,

Ben Feinberg, Process Leader
Work Smart Standards Project
Head of Operations, ALS

encl.
List of Confirmation Team Members
Draft Standard Set

Ernest Orlando Lawrence Berkeley National Laboratory
One Cyclotron Road | Berkeley, California 94720 | Tel: 510.486.4000

BERKELEY LAB

Sent to all stakeholders
Mailing sample

October 10, 1996

Nabil Al-Hadithy
City of Berkeley
2180 Milvia Street
Berkeley, CA 94703

Dear Nabil Al-Hadithy:

Subject: Second Stakeholders' Meeting for Department of Energy's Work Smart Standards Program (Necessary & Sufficient Standards Closure Process)

As you know, the DOE is converting from compliance-driven ES&H activities to standards-based management, which the DOE is calling Work Smart Standards Based Management. The performance objective of the DOE Work Smart Standards Based program is the development and use of ES&H standards to ensure that work is planned, performed, and documented as meeting standards for protecting the environment and the safety and health of the public and workers.

We are inviting you to participate in a second meeting to review the Laboratory's development of Department of Energy's (DOE) Work Smart Standards Program. This **Stakeholder meeting is scheduled for Wednesday, October 16, at 6:30 p.m. at the Laboratory in the Building 90-3148 conference room.** You are being invited because the laboratory considers you a Stakeholder; an individual or organization with vital interest in assuring successful ES&H management of the Laboratory. Our web site offers additional resources which you may find helpful. It is at URL http://www.lbl.gov/Workplace/NS-Program.

At the meeting, the enclosed peer-reviewed draft Standard Set will be discussed along with a request for your comments or questions. As a reminder, the draft set and the draft reports which have been generated during this project are available in the Berkeley and Oakland main libraries, the DOE Energy Information Center in the Oakland Federal Building and at the Berkeley Laboratory Library in Building 50. Those of you who cannot attend this meeting will receive summaries of the proceedings.

Dr. Ben Feinberg, a senior scientist at the Laboratory, is the Process Leader for the Necessary and Sufficient Standards Closure Process at the Berkeley Laboratory. He is assisted by Dr. Jack Bartley, the Environment, Health & Safety Division Deputy Director. The Laboratory looks forward to your participation and to hearing your comments on this important Department of Energy and Berkeley Laboratory initiative.

David C. McGraw, Director
Environment Health and Safety Division
Lawrence Berkeley Laboratory

for Richard H. Nolan, Director
Berkeley Site Office
U.S. Department of Energy

Lawrence Berkeley National Laboratory
One Cyclotron Road
Berkeley, CA 94720

October 18, 1996

To: Stakeholders

Subject: Extension of Comment Period for Stakeholders on the Department of Energy's Work Smart Standards Program

As you know, the Department of Energy (DOE) is converting from compliance-driven ES&H activities to standards-based management, which the DOE is calling Work Smart Standards Based Management. The performance objective of the DOE Work Smart Standards based program is the development and use of ES&H standards to ensure that work is planned, performed, and documented as meeting standards for protecting the environment and the safety and health of the public and workers.

On July 31, the Berkeley Laboratory hosted a Stakeholder meeting to describe the process for selecting the Work Smart Standards applicable to the Laboratory. At that time the process schedule, including a review and comment period for Stakeholders that would end on October 23, was presented; no objections were raised to this schedule. At the second Stakeholder meeting on October 16 the Laboratory reviewed the development of the Work Smart Standards set. At this meeting, concern was expressed by some citizens about the limited time allowed in the schedule for comments from the Stakeholders on the Work Smart Standards set. **The comment period is therefore extended two weeks, until close of business on November 6.** An outline of the October 16 Stakeholder meeting presentation is enclosed for your information.

The laboratory considers you a Stakeholder; an individual or organization with vital interest in assuring successful ES&H management of the Laboratory. Please feel free to share the set of Work Smart Standards with others that you consider Stakeholders, and ask them to provide input on the set to Ben Feinberg, Work Smart Standards Process Leader, at the address below.

In addition to the peer-reviewed set of Work Smart Standards which was sent to you on October 11, the reports which have been generated during this project are available in the Berkeley and Oakland main libraries, the DOE Energy Information Center in the Oakland Federal Building and at the Berkeley Laboratory Library in Building 50.

Please address all comments on the Work Smart Standards set to :

Dr. Ben Feinberg
Mail Stop 80-101
Lawrence Berkeley National Laboratory
One Cyclotron Road
Berkeley, CA 94720

Fax: (510) 486-4960
E-Mail: B_Feinberg@lbl.gov

The Berkeley Laboratory appreciates your involvement in this process.

Ben Feinberg
Head of Operations, Advanced Light Source, Lawrence Berkeley Laboratory

BERKELEY LAB

Advanced Light Source Center

October 18, 1996

To: Stakeholder

Subject: The Ernest Orlando Lawrence Berkeley National Laboratory and Department of Energy's Work Smart Standards Program

In July, we invited Stakeholders, individuals or organizations with a vital interest in assuring successful ES&H management of the Laboratory, to participate in a process (described below) as part of the new era in Department of Energy (DOE) Environment, Safety & Health (ES&H) management. This week, we received a Stakeholder suggestion to add you to the list of Stakeholder participants. We are therefore extending an invitation for your comments on the set of standards, which is described below and in the enclosures. Please feel free to share the set of Work Smart Standards with others that you consider Stakeholders, and ask them to provide input on the set to Ben Feinberg, Work Smart Standards Process Leader, at the address below. Comments are due by close of business on November 6.

The DOE is converting from compliance-driven ES&H activities to standards-based management, what the DOE is calling Work Smart Standards Based Management. The DOE Assistant Secretary for ES&H has specific goals for this change, including:

- enhancement of public and worker safety;
- building of public trust and confidence;
- development of reference points for measuring excellence;
- easier and more effective planning and implementation of work practices; and
- improvements in efficiency.

The performance objective of the DOE Work Smart Standards Based program is the development and use of ES&H standards to ensure that work is planned, performed, and documented as meeting standards for protecting the environment and the safety and health of the public and workers. Achieving this objective should also:

- allow for good judgment in planning work and allocating resources;
- create consistency and stability in expectations and accountability;
- maintain protection, while establishing a balance between costs and benefits;
- permit judgment to be exercised at the appropriate decision level;
- increase the effectiveness of work; and
- allow for bench-marking against best Industry practice.

The Work Smart Standards Based Management concept was initially tested by several focused pilot programs. Based on the success of the pilots, the Energy Research (ER) Program in DOE has asked the Berkeley Lab to be the first multi-program Lab in DOE to take the approach site-wide. What this means is that the Berkeley Lab has been given an opportunity to review the ES&H standards under which it operates. In particular, we have been charged with selecting a necessary and sufficient set of reference standards to measure performance in providing for worker and public safety, and for a responsible and environmentally sound operation. The initiative scope directs the Laboratory to review and select standards for measuring ES&H excellence based on existing Federal, State and local laws, and where applicable, internationally recognized standards. These standards may include those not codified in law or

Ernest Orlando Lawrence Berkeley National Laboratory
One Cyclotron Road ı Berkeley, California 94720 ı Tel: 510.486.7745 ı Fax: 510.486.4773

regulation, but represent the highest operating standards of industrial and commercial institutions. For example, the Berkeley Laboratory reviewed the ES&H operating standards of other private and public research institutions conducting similar operations.

Additional information, including the reports which have been generated during this project, is available in the Berkeley and Oakland main libraries, the DOE Energy Information Center in the Oakland Federal Building and at the Berkeley Laboratory Library in Building 50.

Since Work Smart Standards Based Management is based on existing laws and regulations as reference points to measure ES&H performance, we do not expect the resultant set of operating standards developed for the Berkeley Lab to affect either compliance with regulations or your relationship with the Laboratory. To ensure that this objective is met, representatives from the agencies and communities listed below have been invited to Stakeholder meetings and apprised of developments throughout the process:

University of California Office of the President
United States Department of Energy — Oakland Operations Office
United States Department of Energy — Energy Research
United States Department of Energy — Environment, Safety & Health
City of Berkeley
City of Oakland
County of Alameda
Bay Area Air Quality Management District
San Francisco Bay Regional Water Quality Control Board
East Bay Municipal Utility District
State of California Department of Toxic Substances Control
State of California Department of Health Services — Environmental Management Branch
State of California Department of Health Services — Radiological Health Branch
United States Environmental Protection Agency — Region IX Air and Toxics Division
United States Nuclear Regulatory Commission
University Professional and Technical Employees

Dr. Ben Feinberg, a senior scientist at the Laboratory, is the Process Leader for the Work Smart Standards Process at the Berkeley Laboratory. He is assisted by Dr. Jack Bartley, the Environment, Health & Safety Division Deputy Director. The Laboratory looks forward to your participation and to hearing your comments on this important Department of Energy and Berkeley Laboratory initiative.

Please address all comments on the Work Smart Standards set to :

Dr. Ben Feinberg
Mail Stop 80-101
Lawrence Berkeley National Laboratory
One Cyclotron Road
Berkeley, CA 94720

Fax: (510) 486-4960
E-Mail: B_Feinberg@lbl.gov

Ben Feinberg
Head of Operations
Advanced Light Source
Lawrence Berkeley Laboratory

Signatures

CORE TEAM AGREEMENT

To the best of my knowledge and belief, the Berkeley Laboratory's set of Work Smart Standards are adequate and feasible to protect workers, the public, and the environment from the hazards associated with the work at the Berkeley Lab.
We, therefore, recommend approval of October 1996 set of the Work Smart Standards by DOE and the Ernest O. Lawrence Berkeley National Laboratory.

Jack Bartley	22 Oct 1996 Date
Chester Chang	11-13-96 Date
James Chwang	Date
Jeffrey Chung	10/22/96 Date
Dean Decker	11-5-96 Date
Ben Feinberg	11/6/96 Date
Tanya Goldman	Date
Alan Jackson	11/6/96 Date
James Johnson	Date
Bruce King	10/22/96 Date
Joanne Lorence	11/6/96 Date

CORE TEAM AGREEMENT

Ron Pauer — 10/22/96
Ron Pauer — Date

Bert Schleifer — 10/22/96
Bert Schleifer — Date

Mike Schoonover — 10/22/96
Mike Schoonover — Date

Carl Schwab — 11-5-96
Carl Schwab — Date

Dave Tudor — 10/22/96
Dave Tudor — Date

Philip Williams — 11/6/96
Philip Williams — Date

LABORATORY SAFETY IDENTIFICATION TEAM AGREEMENT

To the best of my knowledge and belief, the Berkeley Laboratory's set of Work Smart Standards, selected by the Laboratory Safety Identification Team, are adequate and feasible to protect workers, the public, and the environment from the hazards confirmed by this Team as being associated with the work at the Berkeley Laboratory. We therefore recommend approval by DOE/OAK and the Ernest O. Lawrence Berkeley National Laboratory of the October 1996 set of Work Smart Standards selected by the Laboratory Safety Identification Team.

Philip G. Williams (Team Leader)	Signature	11/1/96 Date
Jack J. Salazar (Deputy Team Leader)	Signature	11/4/96 Date
Paul M. C. Blodgett	Signature	11-4-96 Date
Dean W. Decker	Signature	11-5-96 Date
Christine A. Donahue	Signature	11-6-96 Date
Richard R. Haddock	Signature	11/19/96 Date
Rick Kelly	Signature	11/14/96 Date
Nancy E. Rothermich	Signature	11-5-96 Date
Richard I. Schwarz	Signature	11/14/96 Date
Michele Sundsmo	Signature	11/14/96 Date

FACILITIES AND INFRASTRUCE IDENTIFIACTION TEAM AGREEMENT

To the best of my knowledge and belief, the Berkeley Laboratory's set of Work Smart Standards, selected by the Facilities and Infrastructure Identification Team, are adequate and feasible to protect workers, the public, and the environment from the hazards confirmed by this Team as being associated with the work at the Berkeley Laboratory. We therefore recommend approval by DOE/OAK and the Ernest O. Lawrence Berkeley National Laboratory of the October 1996 set of Work Smart Standards selected by the Facilities and Infrastructure Identification Team.

Bert Schleifer (Team Leader) ..... Signature ..... 10/24/96 Date

John Bowerman ..... Signature ..... 10/24/96 Date

Chester Chang ..... Signature ..... 10/30/96 Date

James Chwang ..... Signature ..... 10/24/96 Date

Paul Davis ..... Signature ..... 10/24/96 Date

Paul Johnson ..... Signature ..... 10/30/96 Date

Steve McConnell ..... Signature ..... 10/25/96 Date

Patrick Thorson ..... Signature ..... 10/24/96 Date

ENVIRONMENTAL AND PUBLIC PROTECTION IDENTIFICATION TEAM AGREEMENT

To the best of my knowledge and belief, the Berkeley Laboratory's set of Work Smart Standards, selected by the Environmental and Public Protection Identification Team, are adequate and feasible to protect workers, the public, and the environment from the hazards confirmed by this Team as being associated with the work at the Berkeley Laboratory. We therefore recommend approval by DOE/OAK and the Ernest O. Lawrence Berkeley National Laboratory of the October 1996 set of Work Smart Standards selected by the Environmental and Public Protection Identification Team.

Ron Pauer ..... Ron Pauer 11/1/96
(Team Leader) Signature Date

Carl Schwab ..... Carl Schwab 11-5-96
Signature Date

Carol Kielusiak ..... Carol Kielusiak 11-5-96
Signature Date

Mike Schoonover ..... M R Schoonover 11-6-96
Signature Date

Tim Wan ..... Tim Wan 11/5/96
Signature Date

Signature Page for the Accelerator and Fixed Radiation Sources Activity Team Members

To the best of my knowledge and belief, the Berkeley Laboratory's set of Work Smart Standards, selected by the Accelerator and Fixed Radiation Sources Activity Team, are adequate and feasible to protect workers, the public, and the environment from the hazards confirmed by this Team as being associated with the work at the Berkeley Laboratory. We therefore recommend approval by DOE/OAK and the Ernest O. Lawrence Berkeley National Laboratory of the October 1996 Work Smart Standards set selected by the Accelerator and Fixed Radiation Sources Activity Team.

Alan Jackson ..... Alan Jackson 10/18/96
(Team Leader) Signature Date

Robert J. Connelly ..... R J Connelly 10-23-96
Signature Date

Keith D. Gershon ..... K D G 10-23-96
Signature Date

Roger J. Kloepping ..... M P Schoonover for Roger Kloepping 11/1/96
Mike Schoonover
Signature Date

Mark T. Lasartemay ..... Mark Lasartemay 11/1/96
Signature Date

Joanne D. Lorence ..... Joanne D. Lorence 10/24/96
Signature Date

Margaret A. McMahan ..... Margaret A. McMahan 10/23/96
Signature Date

Edwin I. Njoku 10/29/96
Signature Date

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