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Facilities Quarterly

ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY FACILITIES DEPARTMENT NEWSLETTER

APRIL
1997

NEW HAZARDOUS WASTE HANDLING FACILITY NEARS STARTUP

Tucked away in Upper Strawberry Canyon, Berkeley Lab's newest building, the Hazardous Waste Handling Facility (Building 85,) is as isolated as any building on the site. EH&S Waste Certification Team Leader Gale Moline is still getting used to the solitude, but as the EH&S point person throughout construction, he sees the facility's move from shared quarters in Building 75 as a good move.

At almost 13,000 square feet, Building 85 is more spacious than its predecessor, and its location is free of the heavy truck traffic found near Building 75, while still allowing truck access through Strawberry Gate for shipping of waste. More important, as Moline observes, is the fact that Building 85 was designed for waste handling from the ground up. "At Building 75," says Moline, "we did the best with what we had. But Building 85 was designed from its conception for



Upper yard at the new Hazardous Waste Handling Facility.

safe handling of all types of hazardous, mixed, and radioactive waste. The new building gives us the ability to segregate classes of hazardous waste both from each other and within different parts of the building."

This principle of segregation was the main driver in the building's layout. Because of its hillside location, each of Building 85's two main floors opens on a yard

area, with the first floor and lower yard dedicated to radioactive and mixed waste (which is both radioactive and chemically hazardous) and the second floor and upper yard dedicated to chemically hazardous waste, which includes ignitable, toxic, corrosive, and reactive substances.

The concern for isolation of hazardous waste is evident in every design detail. The two yards are
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SAFETY FIRST— BEHAVIOR-BASED ACCIDENT PREVENTION

Fred Lothrop, EH&S Coordinator for the Facilities Department, has learned that when it comes to safety in the workplace, good intentions are not enough. He wants to change work safety *behavior*, making safety actions and consciousness an integral part of the work culture.

Along with Matt Kotowski of EH&S, Lothrop has initiated a program called Behavior-Based Accident Prevention (BBAP). Concerned about the safety record of Berkeley Lab compared to similar facilities, and inspired by a seminar on behavioral science technology that they attended in the fall of 1996, they have begun BBAP as a pilot program in the Facilities Department.

In Lothrop's view, BBAP requires a shift in the way people think about safety. "Up to now, when we've had our monthly safety meetings in Facilities,
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HAZARDOUS WASTE HANDLING FACILITY *continued from page 1*

paved with concrete and topped with a quarter-inch layer of a concrete-like epoxy sealant that is both durable and weather-resistant. Each yard slopes to an isolated 300-gallon capacity sump. In the unlikely event that this isn't enough to deal with a large spill, the yards themselves can safely hold thousands of gallons more.

The yards allow easy access through rollup doors to the staging areas, where materials are sorted and distributed within Building 85 for processing, packaging, or storage. The staging areas are a welcome addition; Building 75 had no dedicated space for intake of waste.

Like other first-floor waste handling areas, the staging area for mixed and

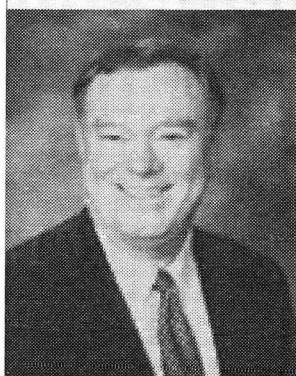
radioactive waste is designed to contain and minimize accidental spills, releases, and fires. The floor is epoxy-coated and slopes to a segregated drainage channel and sump. Fire protection is provided by a high-expansion foam (HEF) system. In the event of a fire this system is activated locally by a heat detector, filling the room in a matter of minutes with fire-smothering nontoxic foam. All waste handling areas on the first level also have explosion-proof electrical fixtures, whose gas-tight construction isolates potential ignition sources from contact with the room's atmosphere.

Mixed and radioactive waste that is ready for packaging is taken to the solidification/compaction area, adjacent to the intake area. Here, an explosion-proof compactor reduces the volume of such solid waste material as rubber, plastic, paper and glass by a factor of from four to six. Liquid waste is poured into 55-gallon drums at slotted drum hoods—a type of fume hood that adjusts to fit around the rim of the drum—and is solidified, often as concrete. Both the hoods and compactor have dedicated high-efficiency particulate air (HEPA) filters, which are backed up by redundant HEPA filters on the main exhaust system.

The treatment area is equipped with fume hoods—again with point-of-use HEPA filters backed up by the HEPA exhaust system—and glove boxes that have their own dedicated exhaust and HEPA filtration systems. Exhaust systems are checked for tritium, iodine, and alpha and beta particles by a continuous air monitoring (CAM) system. The exhaust blowers are monitored by the labwide EMCS system.

Hazardous chemical waste entering the second-floor staging area is character-

continued on page 6



FROM THE FACILITIES MANAGER...

The first piece of news is the retirement of Ed Hoedemaker after 37 years of service to the Laboratory. Ed hangs up his Controller's eye shade and sleeve protectors on April 30 and takes off for the south of France...or Walnut Creek. Chuck Axthelm is moving from the CFO's office to take Ed's place (as much as *anyone* can) and keep us out of trouble.

The Hazardous Waste Handling Facility, Building 85, is open and becoming operational thanks to an excellent job by the project management team led by Joe Harkins, the self assessment team led by Martin Luk, and Don Weber's commissioning team. The Human Genome Laboratory, Building 84, is on schedule and budget thanks to Sheree Siemiatkoski and her project team. Sheree is on loan to us from Livermore (thanks, Jan).

The major issue now facing us is safety. We have had two serious accidents, both with the same root cause: failure to properly lock out and tag out. In both cases the secondary source of power, the backdraft through a blower, was ignored, causing loss of parts of an employee's fingers in one case and a broken arm in the other. Safety must be the first priority on the job for each and every one of us. We are introducing a new safety program this month: Behavior Based Accident Prevention (BBAP). This program is based on observation by a peer and feedback on what a worker is doing safely and what actions may place the worker at risk. The observers will be your fellow workers, not a special team, and everyone will be expected to participate by being an observer. The observer's report does not include the name of the observed worker or other identification and will not be used as part of any performance evaluation. The only goal is to improve safety on the job.

Work **SMART**...work **SAFELY**....If it is not safe, **STOP** the work.

Bob Camper

FACILITIES DEPARTMENT

Facilities provides Berkeley Lab with a full range of architectural and engineering, construction, and maintenance services for new facilities, and modification and support of existing facilities. Architectural and engineering services include facility planning, programming, design, engineering, project management, and construction management. Maintenance and construction functions include custodial, gardening, and lighting services; operation, service, and repairs or replacements to equipment and utility systems; and construction of modifications, alterations, and additions to buildings, equipment, facilities, and

utilities. Additional services include bus and fleet management, mail distribution, and the logistics functions of stores distribution and property disposal.

Ongoing Facilities activities include renewal and upgrade of site utility systems and building equipment; preparation of environmental planning studies; in-house energy management; space planning; and assurance of Laboratory compliance with appropriate facilities-related regulations and with University and DOE policies and procedures.

The Work Request Center expedites facility-related work requests, answers questions, and provides support for facility-related needs.

FOCUS ON SERVICE: The Architectural Section

The Facilities Architectural Section provides services in all phases of building projects, from pre-design stages of facility programming and conceptual design to construction administration.

Successful projects have well-defined scope, budget, and schedule. Trained as generalists to see the "big picture," architects provide valuable input during the pre-design stages of projects when scope and budget are determined.

Architects participate in the process of budget and scope reconciliation by helping users to set priorities and find options that will fit within the budget.

Facility programming is a process of data gathering and analysis that documents the user's facility requirements, including space and space adjacency, equipment, utilities, and future needs

such as expansion and convertibility. The architect develops the resulting "program" into a conceptual design that tests the program against the site to ensure that it will fit, and a conceptual estimate that tests the scope against the budget and time frame. During conceptual design, architects establish the project in three dimensions, verify that the layout meets program requirements, coordinate input of all engineering disciplines and EH&S, and research and incorporate code requirements.

The conceptual design is the basis for Berkeley Lab's line item and GPP fund requests. The time spent at this stage pays off later in a smooth design process and, ultimately, a well-functioning facility.

When the conceptual design has been

approved and the project funded, the more technical phases of design begin. For in-house projects the Architectural Section provides solutions to complex design and technical problems, coordinates the design of all building systems, develops detailed drawings and specifications, and provides architectural design and technical support to other design disciplines.

On projects awarded to outside A/E firms, Facilities architects and engineers function as "owner's representative," reviewing the A/E's work for compliance with overall project goals, program requirements and codes.

During construction, the architect works with the project manager and construction team to ensure that the project is constructed as intended.

COMPLIMENTS

- ICSD's Gizella Kapus commends lead carpenter Jimmie Nez and carpenter Don Decuir for their excellent remodeling work on the ISS Oracle Channel Training Room in Building 936 and Building 938, room 287H. "In general, Jimmie and Don get their work done in prompt and courteous fashion," says Kapus, "This certainly makes one's tasks a lot more manageable." Additional thanks go to Transportation Supervisor Larry Gilbert and to Coordinator Wesley Steele.
- Associate Laboratory Director C. William McCurdy commends Amy Dilts for her "outstanding performance in the establishment of LETS in Computing Sciences." "Your contribution," writes McCurdy, "has allowed our new organization to rapidly integrate into the infrastructure at LBNL."

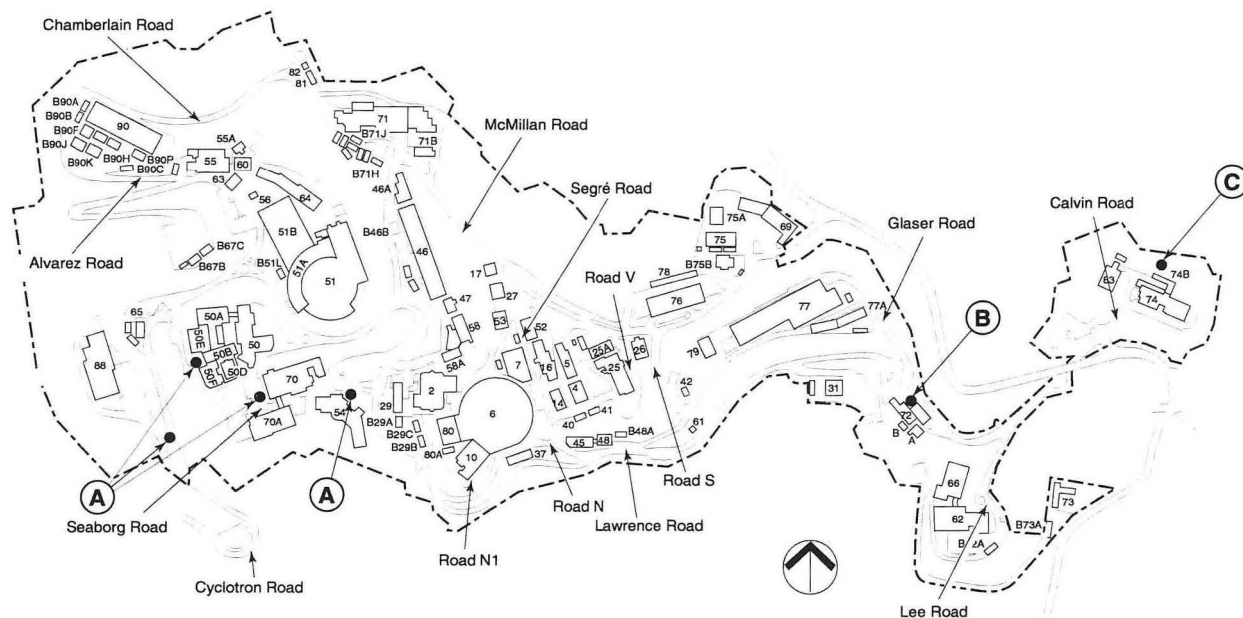
WORK REQUEST CENTER

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WRC welcomes questions or comments about the Facilities Quarterly.

CONSTRUCTION AND YOU

Current construction projects affecting parking or vehicular or pedestrian circulation



Project Contacts. The name in parentheses after each project is the Project Manager (PM) or other person who is responsible for project oversight: coordinating all phases from design through construction; controlling cost, scope and schedule; and ensuring client satisfaction. This person will be happy to answer any questions about the project.

Sanitary Sewer Restoration

A	Sanitary Sewer Restoration		
	APR	MAY	JUN
	Construction of the sitewide Sanitary Sewer Restoration Project will begin in early January and last for approximately 9 months. The project includes replacement of sanitary sewer lines around the LBNL site. Much of the work will take place along main roadways, and some disruption of traffic is anticipated. Parking will also be disrupted on a short-term, rotating basis as construction progresses around the Lab. The first areas to be affected include Cyclotron Road below Bldg 65, parking areas under 50E and 50F, Bldg 70/70A parking, and the Bldg 54 parking lot. (Steve Blair, x5927))		

Bldg 72C Laboratory and Office Addition

B	Bldg 72C Laboratory and Office Addition		
	APR	MAY	JUN
	The new structure will be located at the north end of Bldg 72C in an existing parking area. Site work will require relocation of an existing office trailer. A few parking spaces will be reserved for the contractor during construction. (Charlie Allen, x6438)		

Bldg 84 Human Genome Laboratory

C	Bldg 84 Human Genome Laboratory		
	APR	MAY	JUN
	Construction trailers and activities in this area will continue to impact local parking through mid-1997. Intermittent interruptions to vehicular access will also occur through this period. (Sheree Siemiatkoski, x6088)		

ON THE DRAWING BOARD

projects in study or conceptual design

Blackberry Switching Station Replacement

The Blackberry Switching Station Replacement Project is the last major element in the master plan to rehabilitate the Lab's electrical power system and improve its reliability and safety. The project will upgrade the existing 12-kV power system and use circuit breakers provided in the FY87 improvements to Grizzly Substation. In addition to installing new 12-kV switchgear and cables, the project will eliminate the Big C switching station and switchgear at Bldg 51 and the Bldg 51 substation, and replace outdated 480-V load centers. (Richard Stanton, x6221)

Bldg 74 Rehabilitation of Building Systems

A conceptual design report is now in preparation for the rehabilitation of Building 74 mechanical and electrical systems, seismic upgrade of the structure, and code upgrade of architectural features. As part of the project, the Building 84 utility center would be expanded to accommodate Building 74 utilities, including relocated mechanical equipment and new electrical switchgear. If this project is funded, project design will begin in FY 1999. (Richard Stanton, x6221)

Bldg 77 Rehabilitation Project

Now in the conceptual design phase, this project will rehabilitate Building 77's structural system to restore lateral force resistance and arrest differential foundation settlement. In addition, the project will modernize the building's architectural, mechanical, and electrical systems. (Pablo Orozco, x5820)

IN PROGRESS

funded projects

Building 6 Second Floor Conversion

Final design is in progress for conversion of additional space on the ALS second floor for offices and laboratories. Work includes an elevator at the main entrance to the building. (John Pickrell, x6710)

Building 72C Laboratory and Office Addition

Construction of an addition to Bldg 72C began in December 1995 and was scheduled for completion in December 1996. The addition provides three electron microscope laboratories on the first floor and ten supporting offices on the second floor, for a total area of 285 gross square meters (3,067 square feet). Direct access from the existing building is provided by corridor extensions on both levels. (Charlie Allen, x6438)

Sanitary Sewer Upgrade

This project will replace about 1,066 m of underground sanitary sewer lines. The system is over 50 years old, and degeneration has resulted from the past practice of discharging corrosive substances and from unstable geological conditions. Sewer breaks, offsets, obstructions, and undulations caused by ground movement and settling have resulted in excessive maintenance, sewer line cleaning problems, and possible soil contamination. (Pablo Orozco, x5820)

Bldg 84 Human Genome Laboratory

Construction of exterior skin continues. Lath and plaster work is complete with metal panels and window instal-

lation in progress. Cooling towers have been set in place. Inside the facility, mechanical and electrical roughin nears completion. Partition walls are nearing completion and installation of ceiling grid has begun. Located adjacent to Building 74, the Human Genome Laboratory will provide 3800 square meters of space in three stories for state-of-the-art genetics research. (Sheree Siemiatkoski, x6088)

Chemical Dynamics Laboratory

The new Chemical Dynamics Laboratory is now under construction in Bldg 10. The former Photo Lab area has been gutted to make way for the new facility. The new lab will include HVAC, fume hoods, vacuum pumps, laser curtains and an interlock system. The researchers will provide laser tables, lasers, and other research equipment. (John Pickrell, x6710)

Molecular Design Institute

Design has been completed for Phase 4 of the Molecular Design Institute, to be constructed in Bldg 2, Room 359. The Molecular Design Institute has already occupied Bldg 2, Rooms 307, 321, 327, 331, 333, 335, 355, and 357, which were completed in the previous phases of the project. Construction will include relocation of utilities and electrical power supply, and installation of equipment racks and a laser curtain. (John Pickrell, x6710)

SAFETY FIRST *continued from page 1*

we've tended to focus on specific safety hazards, equipment problems, or poor conditions that we needed to address and to warn people about. These were good and necessary, but they weren't getting at the heart of the matter."

Lothrop and Kotowski wanted to develop a program for evaluating how safely people do their job, and for helping people understand how to work more safely. At the same time, they did not want this program to create friction between management and employees.

They believe that BBAP can answer all these needs. To begin with, BBAP involves the forming of a revolving group or "steering committee" made up entirely of Facilities Department craftspeople and technicians—no management personnel—and operating with management's full support. Formed last fall, this group has completed, as the program's initial phase, an analysis of the Facility

Department's accident history for the last two years.

From its historical analysis, the steering committee derived a "score sheet" of "critical behaviors" to be used in the observation phase of the program. The score sheet's critical behavior categories include body use, personal protective equipment use, following of procedure, tool use, and adjustments to physical limitations and weather conditions.

The program is now in the observation phase, in which an employee ("coach") on the BBAP steering committee observes a peer employee on the job for a 15–20 minute period. The observed employee's name does not appear on the score sheet, but he or she receives a score as well as constructive feedback from the coach.

The score is recorded as part of a group score for an entire craft or discipline.

Only the observed employee and coach know the employee's score. The observations take place every month, with both individual and group score expected to improve from the previous month.

The program's two main goals are to reduce, over the next three years, the number of OSHA-reportable accidents at Berkeley Lab from what it is now (~15 cases per 100 employees per year) to at most 4 cases per 100 employees per year; and to chart safety improvement from month to month.

Mike Miller, the present chairperson of the steering committee, recently compared safety programs of previous years to BBAP: "In the past, it has been hard to generate enthusiasm about safety programs, perhaps because they were perceived as 'top down,' management-driven efforts. Not so with this one. People really seem to want to make it work. This, more than anything else, makes us feel very positive about the program."

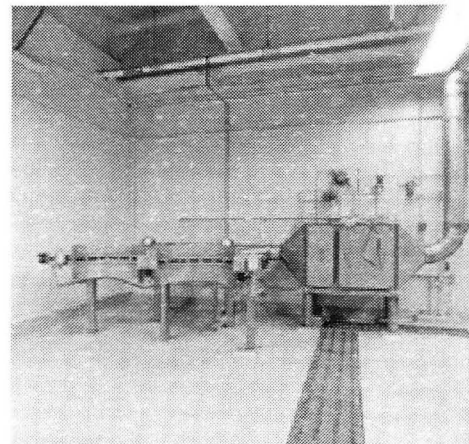
HAZARDOUS WASTE HANDLING FACILITY *continued from page 2*

ized and stored in separate lockers for acids, bases, and flammables. Lab packing of small containers into drums or heavy cardboard containers for shipment is done at drum hoods.

Concrete pads in the adjoining upper yard are currently awaiting arrival of several waste storage lockers from Building 75. A shelter for waste oil and other flammables is already in place. The shelter is equipped with an aqueous film-forming foam (AFFF) fire protection system. AFFF systems work by enveloping the burning surfaces to cut off the oxygen supply. Like HEF, AFFF requires

relatively small amounts of water, minimizing the problems of cleanup of contaminated water and of fire water runoff into storm sewers.

In addition to their role in overseeing construction, Facilities Project Manager Joe Harkins and his project team have lately been busy with commissioning of building systems, which is now complete, and with the Safety Readiness Review, a cooperative effort with DOE and EH&S that ensures that systems, maintenance and operation procedures, and training are all in place for startup of Building 85.



Slotted drum hoods (left) and HEPA filters at Building 85.

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