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Author

Lawrence Berkeley National Laboratory

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Facilities Quarterly

LAWRENCE BERKELEY LABORATORY FACILITIES DEPARTMENT NEWSLETTER

July
1993

12kV UPGRADE POWERS LBL INTO FUTURE

Contract negotiations are under way for construction of Phase 2 of the Electrical Systems Rehabilitation Project, and preliminary design work for Phase 3 begins this month. The six-phase project will upgrade LBL's 12kV distribution system to current engineering standards, improving reliability, safety, and ease of maintenance while providing capacity for future growth.

The 12kV system is used for Labwide distribution of power via underground "feeders" between Grizzly Substation, where the electrical utility's lines enter LBL, and the individual facility substations, where

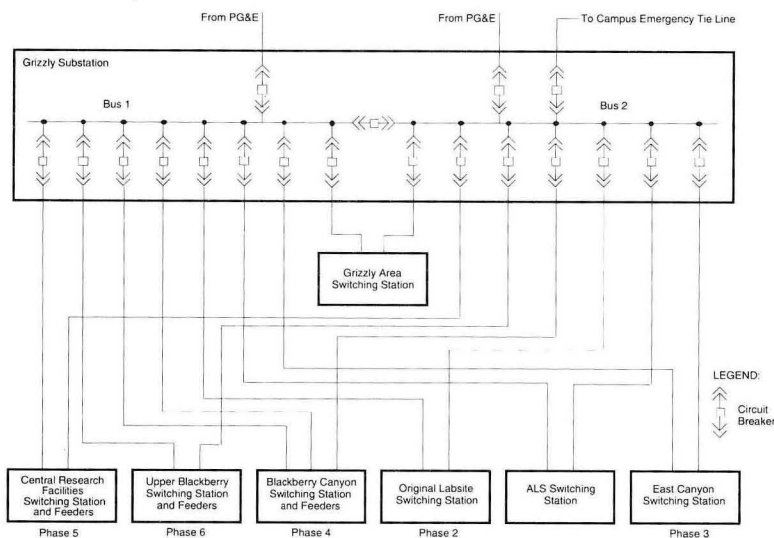
the voltage is adjusted to provide the power for everything from accelerators to coffee pots.

The system originated in the 1940s with a single feeder from the UC campus substation. The 12kV switchgear was largely homemade and enclosed in a lean-to shelter attached to the 184-inch Cyclotron Building. In the early 1950s new feeders and the Big C switch station were added, primarily to supply power for the Bevatron. By the mid-1950s the Lab's power needs were too great for the Campus Substation, and, in 1957, Grizzly Substation entered service. An East Canyon line was added in 1966, and a feeder to the Lawrence Hall of Science and the Space Sciences Center came on line in 1967.

LBL's subsequent growth has been handled by using any excess capacity that could be coaxed out of the existing 12kV system. This stopgap approach had the virtue of being quick and relatively inexpensive, but in the long run it tended to degrade the robustness of the system. Feeders for new facilities were doubled with an existing feeder on a single circuit breaker, creating the possibility of widespread outages and damage to cables and equipment. Similarly, the broad impact of planned outages has made system maintenance more disruptive and difficult to schedule. Inadequate capacity has also made it impossible to provide dual power sources to all users, further hampering maintenance and reducing reliability.

Confronted with an aging system on which power failures were likely to become increasingly frequent, the Architecture and Engineering group carried out a comprehensive review of short and long range plans for LBL site development and mapped out an

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Future 12kV System

SETTING PROJECT PRIORITIES: THE CALL

Facilities has integrated the Work Request Center (WRC) and the Call process to ensure that construction project needs are acknowledged, prioritized, and completed. The WRC provides the Laboratory community with "one stop shopping" for any facilities-related need.

Under this new arrangement project requests that are funded by the requesting department are prioritized for immediate implementation. Urgent projects requiring institutional funding are also

acted upon immediately. All other projects seeking institutional funding are prioritized through the Call process. This ensures that the originating department has an opportunity to participate in the prioritization process. It also ensures that the origi-

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SETTING PROJECT PRIORITIES

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nating department is regularly informed as to the status of the requests.

When you request a project that requires institutional funds, it is referred to Facilities Planning by the WRC. Facilities Planning will contact you by the end of the next business day to discuss how your request will be acted upon and the possible interim

actions that may be taken if funding is not immediately available.

Since there are typically more project requests than can be funded, requests must be prioritized. Prioritization ensures that funds are applied first to the projects most critical to the Lab's overall needs.

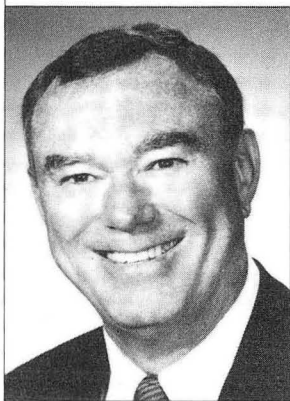
Projects that are not immediately funded are reviewed with the originat-

ing division during the annual Call process. These requests and any other divisional needs are reviewed by the division call coordinator. The call coordinator is responsible for developing priority lists for all requests that originate in his or her division.

In late June, Facilities collected the divisions' lists and is now assessing the projects in order to rank all project requests. This assessment is based on DOE's Risk-based Priority Model (RPM), which measures a project's significance against criteria such as safety and environmental protection concerns, compliance with regulations and DOE Orders, and its importance to LBL and Divisional missions. Facilities will prepare a list of projects for each funding category, based on this RPM assessment and the priority assigned by the originating division.

These project lists are reviewed by the Project Coordination Committee (PCC), which consists of representatives of the Office of Planning and Development, Administration, Operations, and Finance Department. The PCC makes recommendations to the Associate Laboratory Director for Operations (ALD-Operations). The ALD-Operations will review all project requests, with the assistance of the EH&S Division Director and the Facilities Manager. This review ensures that all Laboratory goals and objectives have been fully considered. The ALD-Operations will submit the top-ranked projects to the Director's Action Committee (DAC). Project funding is considered and authorized by the DAC, with funding decisions expected in September.

Facilities is committed to making the Call process an open, objective assessment of LBL's facilities needs. We are interested in your views. Please contact Rich McClure or Bob Camper with any thoughts or comments.



FROM THE FACILITY MANAGER...

The past three months have brought good news and bad news. The change of Administrations has brought a change in budget policy, with the result that LBL did not receive expected construction funding. Most disappointing was the postponement of the Safety and Support Services Facility, which we had hoped to start this year. We also had to postpone some infrastructure projects. The good news is that work on the

Hazardous Waste Handling Facility has started, with groundbreaking ceremonies on May 19th. The seismic rehabilitation of Building 90 is also under way.

By now the Divisions have received the Call for next year's projects from Rich McClure. Your input to this process will be prioritized by the Project Coordinating Committee, reviewed by David McGraw and myself, and approved by Director's Action Committee for non-capital operating or general plant project funds. We hope to get approval in September so we can start work as soon as fiscal year 1994 funding is available. If projects are received in the Call whose scope exceeds the non-cap or GPP limits, they will be considered for development into a Line Item Project.

This issue features another Facilities Department innovation, the Small Projects Group. This group of talented design professionals is led by Project Manager Bill Wu and is tasked with responding quickly to very special or limited projects. By simplifying the design process and keeping the work contained within this dedicated group, this approach results in more efficient project completion and saves the Laboratory money. Projects that you submit through the Annual Call or the Work Request Center are evaluated and, if they will benefit, are assigned to the Small Projects Group. You do not have to make any special request.

As always, I welcome your telephone calls or memos suggesting ways for Facilities to provide you with better support.

Bob Camper

FACILITIES DEPARTMENT

The Facilities Department provides LBL with a full range of planning, architecture, engineering, maintenance, operations, and inspection services for development of new facilities and modification and support of existing facilities.

Ongoing Facilities activities include upgrade of site utilities and building equipment; preparation of environmental planning studies; in-house energy management, facilities planning; and assurance of

compliance with regulations and with University and DOE policies.

Facilities functions include custodial, gardening, and lighting services; operation, service, and repairs of equipment and utilities; and construction of modifications to equipment, facilities, and utilities.

The Work Request Center can initiate work requests, answer questions, and provide other support for your facilities-related needs.

FOCUS ON SERVICE: SMALL PROJECTS GROUP

A major goal of Facilities is to simplify the work request process and improve its response time, especially on small projects. Every year, several hundred small construction projects are funded in LBL's budget. These jobs must be completed within the fiscal year or lose their funding. Last year, the department's Small Projects Group was formed to handle engineering for projects from a few thousand dollars up to \$100,000, with some special assignments ranging higher.

The Small Projects Group works on multiple jobs at a time, each lasting from a week to several months. Group manager Bill Wu stresses good communications between disciplines—an integrated approach—to achieve the quick turnarounds needed to handle the workload. Group engineers confer with each other continuously, identifying conflicts between their designs before they become costly problems. The group's cohe-

siveness is helped by the use of AutoCAD, which gives all team members online access to any project drawing, greatly shortening revision cycles.

All the traditional engineering disciplines are represented in the group's membership, with additional capability provided by a dedicated CAD designer/coordinator. Currently, the group includes the following highly qualified professionals:

- Alex Shtromberg—Lead / Mechanical
- Dorel Anghel—Mechanical
- Yongyop Kim—Architect
- Tom Byers—Electrical
- Max Ostas—Civil/Structural
- Inna Massen—Mechanical Designer/CAD Coordinator.

Other Facilities personnel can be assigned to the group as needed to handle special assignments or work overflow.

The group receives its assignments from the Work Request Center, which refers any projects requiring engineering work, including projects needing evaluation for code compliance, such as installation

of interior walls. The group also ensures that NEPA and SARS documentation are complete before construction. The group takes about a week to respond to a work request. Estimates take from a few hours to a week. Unfunded projects often come to the group for preliminary estimates.

The group's design projects include the Director's Conference Room in Bldg 50A, a new clean room in Bldg 70, a seismically reinforced LCW tank, the Bldg 65 parking lot upgrade, office space rehabilitation and HVAC modifications in Bldg 65, laboratory modifications and fire stops in Bldg 71, Bldg 90 second floor modifications, and a vacuum pump exhaust installation at Bldg 66, to name a few.

The Small Projects Group works closely with M&O, which attends the group's meetings and assigns superintendents to manage small projects. This additional level of integration ensures a high degree of buildability and faithful execution of engineering designs.

WORK REQUEST CENTER

Telephone	6274
Fax	6272
Quickmail	FACILITY
E-Mail	FACILITY@lbl.gov
VAX-Mail	FACILITY@lbl.gov
Mailstop	76-222

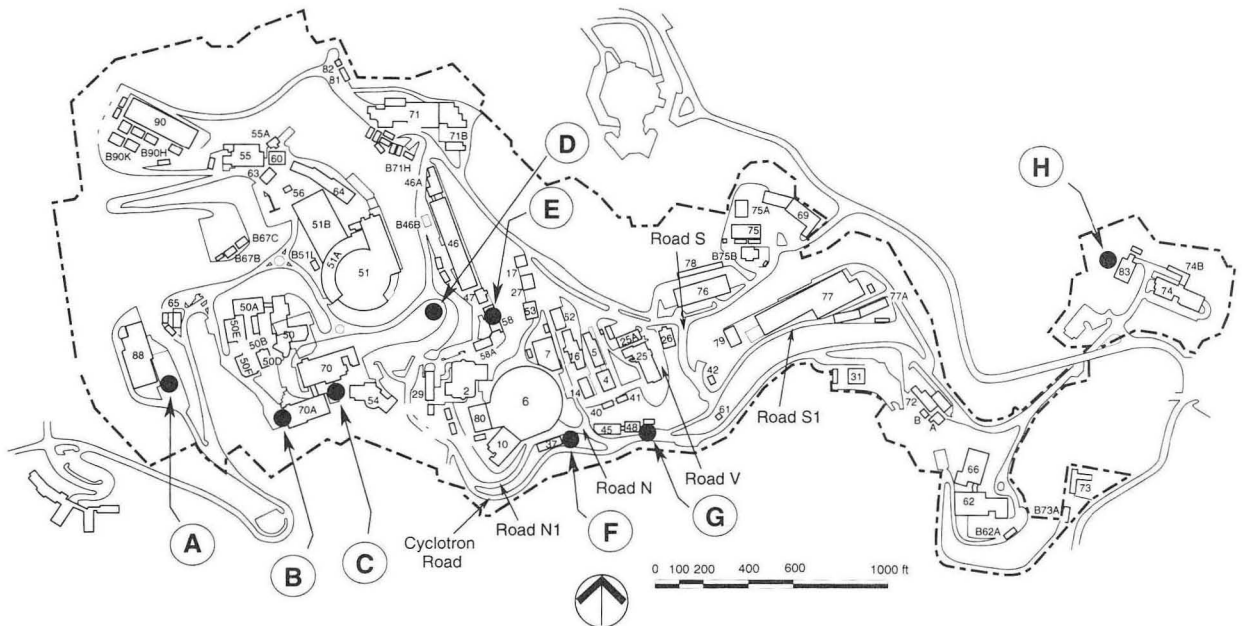
COMPLIMENTS

Successful completion of ALS Project

- Fred Lothrop, Team Leader, characterized Facilities' contribution as vital to the Operational Readiness Review's success.
- Ron Yourd, ALS Project Manager, expressed his gratitude for Facilities' high level of support and for the extra effort required of many individuals.

CONSTRUCTION AND YOU

current construction projects affecting parking or vehicular or pedestrian circulation



Bldg 88 Second Level Addition

A	JULY	AUGUST	SEPTEMBER
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Construction began in April and will continue through October. About 8 parking spaces will be reserved for the contractor. Persons other than Bldg 88 occupants and visitors should refrain from parking in the area.

Bldg 70/70A Site Ventilation Improvements

B	JULY	AUGUST	SEPTEMBER
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For July, 12 parking spaces adjacent to Bldg 70 will continue to be reserved for a laydown area, trailer and parking for the contractor.

Instrumentation Support Lab Rehabilitation

C	JULY	AUGUST	SEPTEMBER
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Modification of chemistry labs on the third floor of Bldg 70A will continue into February 1994. The loading dock area behind Bldgs 70 and 70A is reserved for the contractor.

Slope and Seismic Stabilization

D	JULY	AUGUST	SEPTEMBER
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Construction began in May. About half of the parking spaces in the "Y" lot are reserved for the contractor until October 1993.

Bldg 58 12 kV Substation Replacement

JULY	AUGUST	SEPTEMBER	E
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Construction of the 12 kV substation for Bldg 58 and surrounding facilities has started. Parking in area will be affected through February 1994.

Original Labsite Substation

JULY	AUGUST	SEPTEMBER	F
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This project will begin construction in June and continue through January. Slowdowns or delayed traffic will occur periodically along Road N and Cyclotron Road.

Bldg 48 Firehouse Addition

JULY	AUGUST	SEPTEMBER	G
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Construction of a new 183 gsm (1,968 gsf) addition to the firehouse began in March and is expected to last nine months. Parking in the area immediately adjacent to the firehouse will be reserved for subcontractor use.

Hazardous Waste Handling Facility Site Work

JULY	AUGUST	SEPTEMBER	H
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Construction began in April and will last 6 months. Included will be an access road, site utilities, and the grading of two yard areas. 10 spaces in the Bldg 83 parking lot and 5 spaces between Bldg 74 and Bldg 74B will be reserved for subcontractors.

ON THE DRAWING BOARD

projects in study or conceptual design

ALS Beamlines Initiative

Now in the conceptual design phase, the project will provide a second complement of experimental facilities for the ALS, including insertion devices, beamlines, and 1,876 gsm (20,200 gsf) of finished light laboratory and office space for ALS users. Located on the second floor of the ALS building, these new facilities will support research in materials and surface science, chemical dynamics, and structural biology. If funded by Congress, design work will begin in early 1995, with project completion scheduled for 1998.

Chemical Dynamics Research Laboratory

The CDRL will provide state-of-the-art national user facilities for a laser and synchrotron radiation based program of chemical dynamics research. Facilities include ALS chemical physics beamlines advanced lasers, molecular beam chambers, universal particle mass detector, computer-based modeling systems, and auxiliary instrumentation. Located next to the

ALS, the 3,065 gsm (33,000 gsf) CDRL building will have a high-bay heavy laboratory to house the major scientific equipment, 8 support labs, and offices for LBL and visiting researchers and graduate students.

Induction LINAC Systems Experiment

A weather-tight building will be constructed within Bldg 51B to house ILSE. Bldg 51B is an open, high-bay experimental hall in the Bldg 51 Bevatron Complex. The new building will consist of a heavy laboratory experimental space to contain the accelerator and its associated equipment, a light laboratory support space, and an accelerator control room. Researchers will use the ILSE accelerator to study the potential use of heavy-ion fusion in a future fusion power reactor.

Energy and Environment Laboratory

Now in the conceptual design phase, this 7,400 gsm (80,000 gsf) facility will provide lab, office, and high-bay space for Energy and Environment Division programs in energy efficiency, including building technologies, and electrochemical and thermal energy storage. If funded, project design could begin in 1997.

IN PROGRESS

funded projects

East Canyon Electrical Safety Project

Design work is now in progress for upgrades to the East Canyon 12kV distribution system. Improvements will include 1,035 m (3,400 ft) of new underground duct banks and 10,350 m (34,000 ft) of 12kV cables, construction of a new switching station, and construction of a new 500kVA substation serving the National Center for Electron Microscopy. The East Canyon Electrical Safety Project is the third phase of the labwide 12kV Rehab Project. Construction is scheduled to begin in 1995.

Bldg 35, Original Labsite Substation

A construction contract will soon be awarded for the Original Labsite Substation, the second phase of the 12kV Rehab Project. This new substation will supply power to the Original Labsite. Work includes installation of a foundation, switchgear, capacitor banks, transformers, and duct banks. In addition, a 12kV feeder to Bldgs 58 and 46 will be replaced, as will 12kV feeders to Bldgs 25 and 16. New feeders will be installed to serve buildings in the eastern part of the Original Labsite area. Construction completion is scheduled for early 1994.

Hazardous Materials Safeguards, Phase 1

An engineering firm has been selected for design of safety, health, and environmental protection installations for Bldg 70. Improvements will include fire

protection separations for different occupancy types, and upgrades to the ventilation and electrical systems. Bldg 70 will then meet industry standards for the storage, dispensing, and use of hazardous materials used in research. Construction is scheduled to begin in late 1994.

Bldg 85, Hazardous Waste Handling Facility

Sitework construction is proceeding on the Hazardous Waste Handling Facility. Located in the Life Sciences Research Area, the new facility will consolidate existing waste handling activities in one location. Sitework includes construction of the roadway, retaining walls, and site utilities, and is scheduled for completion in November 1993. Construction of the building will begin in mid-1994, with completion in the Spring of 1996.

Bldg 90 Seismic Rehabilitation

Relocation of personnel in preparation for the structural phase of the Bldg 90 Rehab is complete, as is the nonstructural work, including bracing of light fixtures, ducts, pipes and walls in exit paths. Structural work is scheduled to begin in September 1993. This work will include construction of subsurface retaining walls at either end of the building, installation of 8 seismic buttresses, and jacking of 3 building columns. Construction will continue through September 1994.

ELECTRICAL UPGRADES

continued from page 1

orderly rehabilitation plan for the power system. This review looked at the effect of future projects on the distribution system and considered the upgrades needed to handle future expansion. Meetings with key LBL maintenance personnel pinpointed system malfunctions, changes that could enhance reliability and efficiency, and the highest risks for hazards and system failure.

The project divides LBL into six 12kV service areas, corresponding to the project's six phases. Each service area will be supplied by a new or upgraded switching station (the ALS is supplied by a dedicated switching station built as part of the ALS project). The stations will receive power via redundant feeders from Grizzly Substation (see figure). This will allow isolation of the service area and backup power if an outage occurs. The switching stations, in turn, provide breakers and redundant feeders to facility substations. The 12kV upgrade will further improve reliability and safety by replacing old switching and distribu-

tion equipment and adding modern instrumentation, control and data acquisition systems.

Phase 1, the Grizzly Substation Upgrade, is now complete. It replaced old circuit breakers and switches and added new ones to take advantage of the existing double-bus configuration and remedy operating deficiencies and unsafe conditions. The new circuit breakers will allow bus and feeder isolation as well as bypass and networking functions.

Before rehabilitation, power to either of the two main buses at Grizzly Substation could only be switched off by PG&E. Breakers have now been installed that allow LBL to independently reroute backup power in case of a failure on one of PG&E's transformers. Addition of breakers between the main buses and feeders has eliminated doubling and allows backup power to all 6 switching stations.

The Grizzly Substation Upgrade has established a solid foundation

for the remaining phases of the 12kV Project, and already provides a much higher level of reliability and flexibility. With construction startup nearing for the Original Labsite Substation and design in progress on the East Canyon Project, we can look forward to further improvements.

SUBSTATION UPGRADES

Work is under way to replace obsolete transformer substation equipment at several buildings. The substations at Bldgs 46, 50 and 74 have already been rebuilt, construction is about to start on a new substation for the Bldg 58 area, and a new substation at Bldg 72 is being designed. The electrical distribution systems at these buildings will also be upgraded to meet new power and electrical code requirements. As with the 12kV Rehab, every effort is being made to carry out these upgrades with a minimum of disturbance to the building occupants. However, some power outages will be necessary to tie in temporary power sources and make final connections. The Facilities Department appreciates the high degree of cooperation received so far from the Lab community.

M&O ASSISTS RESEARCHERS PREPARE AHDs

One of the many services offered by the Facilities Department, Maintenance and Operations section, is assisting researchers prepare the maintenance portion of Activity Hazard Documents (AHDs).

DOE Order 4330.4A requires LBL to implement a formal maintenance program for all equipment. AHDs (formerly OSPs) are safety documents included in LBL Notebooks that state the risk potential grade of research projects or unique activities and identify

hazards and the controls necessary to ensure that the risks associated with the potential hazards are at an acceptable level. This grade determines the maintenance program required.

Upon receipt of an AHD, Facilities reviews the maintenance statement for equipment name, how often it is used, who maintains it and according to what schedule, and what system of record-keeping is used. An M&O engineer then contacts the researcher to schedule a site review.

During the site visit, the engineer helps the researcher grade the risk potential of the system and subsystems, identify the hazard prevention devices and control systems, and determine maintenance needs.

This helps the researcher complete the AHD, establishes or enhances the equipment maintenance and documentation system, and helps to sensitize the researcher to the importance of regular maintenance and record-keeping. Many researchers already have suitable maintenance programs and practices in place, and only need support in understanding the record-keeping requirements.

ERRATA The *In Progress* section in the April 1993 Facilities Quarterly, mistakenly referred to the Cellular and Molecular Biology Division as the Chemical and Molecular Biology Division.

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