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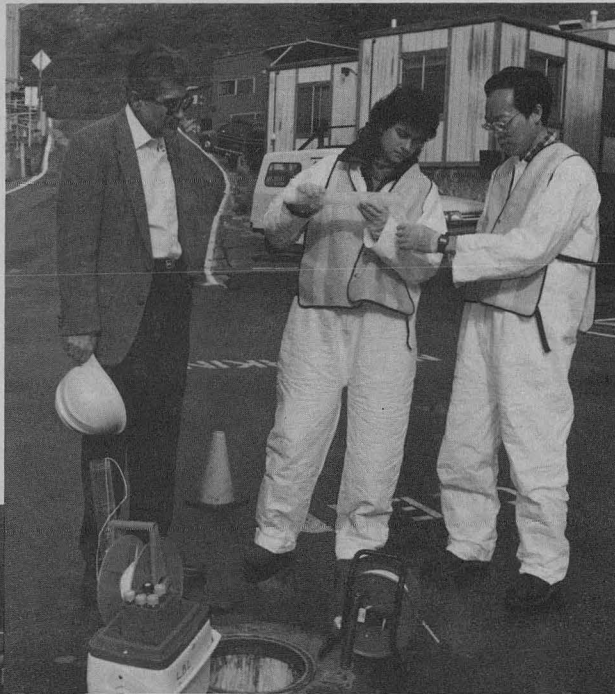
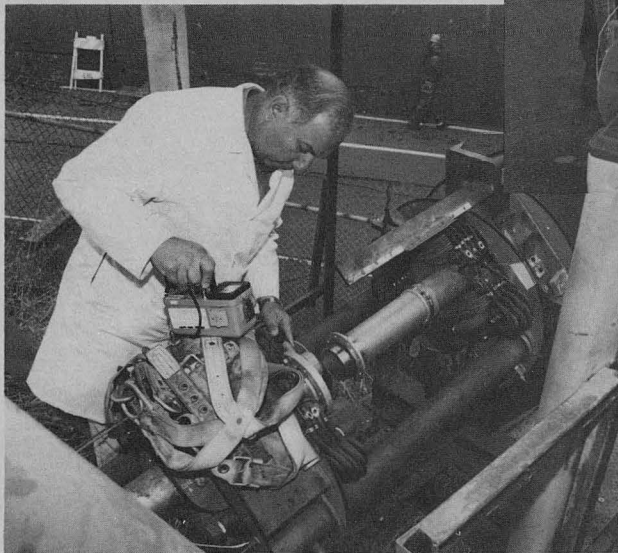
Author

Albert, R.

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EH&S



Summary of Activities, 1992 Environment, Health & Safety Division Lawrence Berkeley Laboratory

March 1994

Prepared for the U.S. Department of Energy under Contract DE-AC03-76SF00098

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EH&S Annual Report

Summary of Activities
Environment, Health & Safety Division
1992

Lawrence Berkeley Laboratory
University of California
Berkeley, CA 94720
March 1994

Prepared for the U.S. Department of Energy under Contract DE-AC03-76SF00098

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1. Notes from the Division Director

When I accepted the position of EH&S Division Director back in 1991, I was faced with an enormous challenge: how to convert the existing organization into the kind of organization necessary to meet the environment, safety, and health (ES&H) requirements of the 1990s and beyond. Repeated cutbacks had left an EH&S organization that was performing as well as could be expected, given the limited resources allotted it. But the organization that existed in 1990 was not an organization that would satisfy increased ES&H demands.

In 1991, I inherited an organization whose structure was fragmented, with no clear lines of authority and with a mixture of reporting relationships. As a result, numerous environmental regulations were being ignored; they just "slipped through the cracks." Furthermore, there was no coherent institutional voice regarding ES&H issues: in fact, the LBL mission statement did not even mention ES&H.

It was clear that the existing situation could not continue. Everyone knew that the Tiger Team visit of early 1991 would focus on LBL's ES&H inadequacies, and that this focus would extend to other agencies that affect LBL as well. Increased oversight by DOE and increased requirements from the Hanford radioactive waste disposal site were assured.

The Tigers did find many deficiencies at LBL, most of them related to three root causes:

- an informal management style,
- an organization (LBL) not equipped to handle the ES&H requirements of the 1990s, and
- a lack of program commitment to ES&H on the part of DOE.

These deficiencies were not restricted to ES&H issues, but they did bear heavily on ES&H at LBL. The challenge was to bring LBL's EH&S Division up to the level necessary to meet the new standards, hopefully with the backing of senior LBL management.

Continued on next page.

1. Notes from the Division Director (continued)

LBL decided that the best way to meet this goal was to focus on a three-way buildup of the Division, in the following order:

- Build up the EH&S professional staff to the minimum level necessary to meet the requirements of the 1990s and beyond.
- Create the policies, procedures, and other documentation and guidance needed to carry out the required tasks.
- Reorganize the management system of the Division.

After two and one half years, we are nearly at the end of this three-way buildup of EH&S.

Staff

In 1990 there were 81 full-time equivalent employees (FTEs) serving in different groups that make up the current EH&S Division. Today there are 157 FTEs, nearly a doubling of staff. This sounds like an impressive staff increase; and there **has** been a significant increase in EH&S professionals at LBL. But the overall numbers hide some important information. In 1990 about half of the total EH&S population (39) consisted of Health Services and Fire Department personnel. These numbers had not changed significantly in the past ten years, and they have not changed significantly since 1990, since health service and fire protection are constant requirements. Where the growth has primarily occurred is in Site Restoration and Waste Management: in 1989 there were **no** LBL employees in Site Restoration; in 1990 there were five employees in Waste Management. Today there are 28 in these two groups. Staffing in the remaining EH&S areas has increased too, from 37 in 1990 to 87 in 1993. There will be some more additions made to the staff, but the bulk of the staffing up has been completed. I am confident that we now have the core of competent professionals to do the jobs we are required to do.

Policies, Procedures, and Guidance

As all EH&S employees know, one of the major tasks of the past two years has been to generate the policies, procedures, and guidance necessary to accomplish our tasks. In 1991, this area was woefully underdeveloped in EH&S. Many required documents were just not being produced. A brief scan of this report will show how extensive the production of all forms of documents has been the past year. We have been playing catch-up in this area, and I feel that we are only just now getting even with all our required documentation.

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1. Notes from the Division Director (continued)

Management Systems

The reorganization of EH&S has been one of my greatest challenges. Sometimes it has probably seemed to EH&S employees that we had joined the "reorganization of the month" club, so extensive have the organizational changes been. But these changes have not been frivolous: We have all had to cope with a rapidly growing and evolving organization. The current organization, with the Division divided into three Departments, should represent the organization of the future. It solves most of the organizational problems that existed when I first arrived: lines of authority are clear, as are reporting relationships, and the organization is unified, with all areas of responsibility covered.

Based on our current organizational structure, and given the high quality of professionals now working for EH&S, the future looks exciting for EH&S at LBL.

2. The Environment Department

Departmental Overview

Mission

The mission of the Environment Department is to

- ensure that the activities and operations at LBL in the areas of waste management, environmental protection, and environmental restoration are performed in a safe, responsible, and fully compliant manner;
 - effectively and efficiently manage the waste generated by LBL operations and activities in accordance with applicable laws, regulations, rules, and DOE orders;
 - investigate and remediate, if necessary, areas contaminated by past activities and practices at LBL; and
 - monitor the environment to ensure that LBL complies with all applicable Federal, state, and local environmental regulations.
-

Groups

In order to accomplish this mission, the Department is divided into three Groups:

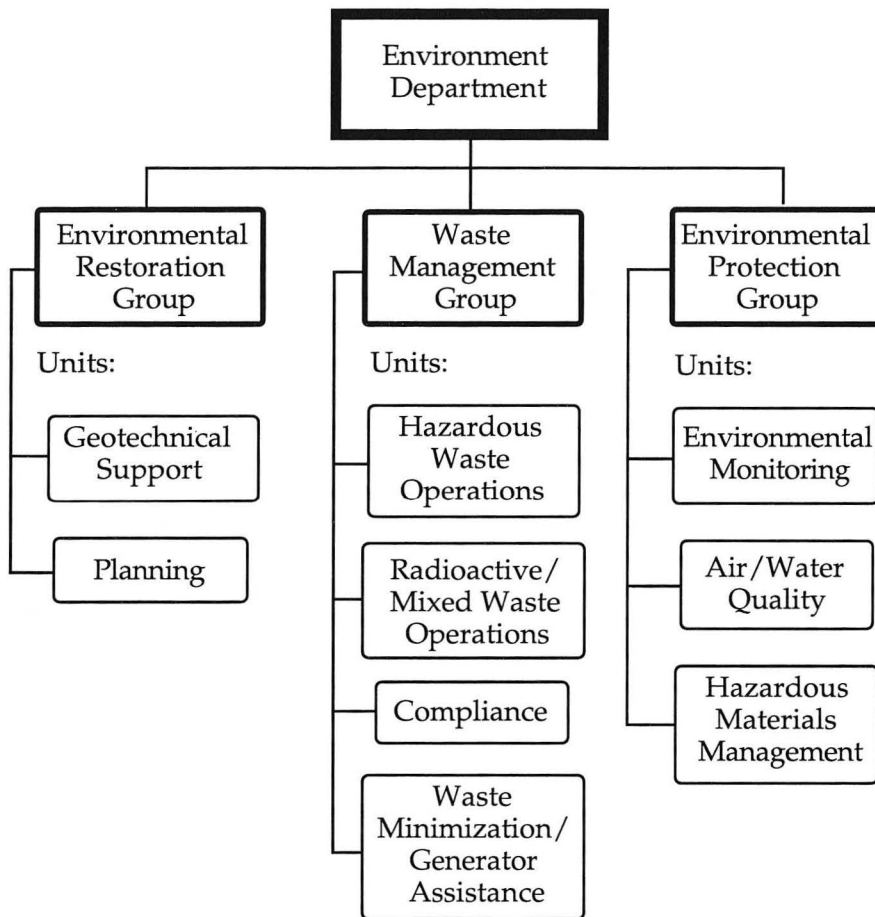
- Environmental Restoration
- Waste Management
- Environmental Protection

The Environment Department organization chart is shown on the next page. Details of each Group's activities are provided on the following pages.

Continued on next page.

Departmental Overview (continued)

Environment Department Organization Chart



Environmental Restoration Group

Overview

The Environmental Restoration Program is part of a nationwide effort by the Department of Energy to identify and clean up contaminated areas at its facilities. The Cal-EPA Department of Toxic Substances Control (DTSC) completed a RCRA Facility Assessment (RFA) of LBL in November 1991. The RFA identified areas where there was evidence of a release of hazardous materials or wastes to the soil and groundwater. On May 4, 1993, a Part B Permit was issued to LBL by DTSC. The Part B Permit requires LBL to address corrective action of all releases of hazardous waste at the facility.

The Environmental Restoration Group is responsible for the following activities:

- identifying areas of contamination, including soil and groundwater, that may pose a risk to human health or the environment
- determining the sources, magnitude, and extent of the contamination
- developing plans to remediate contaminated areas
- ensuring that all Environmental Restoration activities comply with applicable Federal, state, and local environmental regulations.

Organization

In order to carry out these tasks, the Environmental Restoration Group is divided into two units:

- the *Environmental Restoration Planning Unit*, which is primarily responsible for the management of resources and funding; ensuring compliance with applicable Federal, state, and local environmental regulations; and communicating program information to the U.S. Department of Energy (DOE), regulatory agencies, and other interested parties.
- the *Environmental Restoration Geotechnical Support Unit*, which is primarily responsible for characterizing the geology and hydrogeology of the LBL site as they apply to the occurrence and movement of contaminants, characterizing the nature and extent of contamination, assessing potential risk to the public and environment, and evaluating and overseeing the design, installation, and operation of remediation systems.

Continued on next page.

Environmental Restoration Group (continued)

Accomplishments During 1992, the Environmental Restoration Program accomplished the following:

- Implemented a monthly Progress Tracking System Report.
- Prepared an Environmental Restoration Baseline and Roadmap document.
- Completed a Preliminary Review/Visual Site Inspection for the LBL site, consisting of 40 interviews and the review of over 50 documents (reports, maps, drawings, and photographs).
- Completed a Sampling Visit, which included conducting soil gas surveys at 367 points, installing 28 monitoring wells, and taking samples for 904 soil analyses and 530 groundwater and surface-water analyses.
- Completed a RCRA Facility Assessment of the LBL site. Seventy-three Solid Waste Management Units and 63 Areas of Concern were identified in the assessment.
- Initiated community relations efforts with regulators.
- Awarded a \$1 million technical services contract.
- Prepared two reports on the detailed geology of specific LBL areas:
 - the Old Town area
 - the Building 69-75-77 area
- Produced a Master Engineering Report on the water level, temperature, and conductivity distribution of groundwater at LBL.

A summary of the Environmental Restoration Group's program elements is included in the following table.

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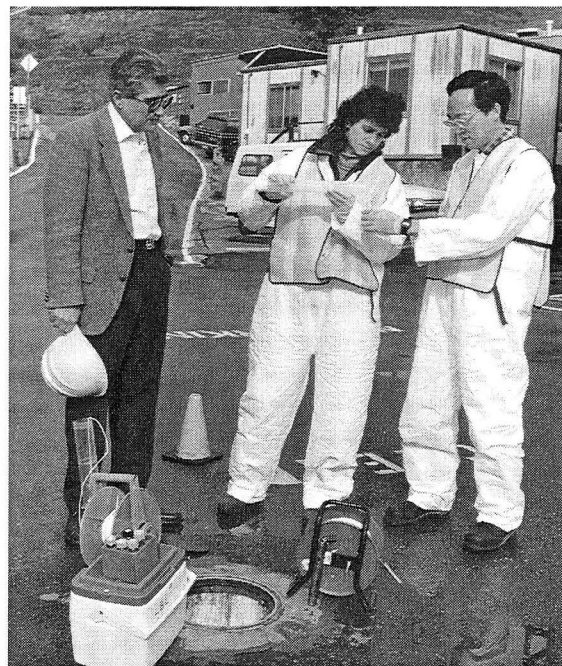
Environmental Restoration Group (continued)

Environmental Restoration Program Elements

Monitoring Activity	Frequency	Matrix
Monitoring of temperature, electrical conductivity, and water depth in wells and slope stability facilities.	Monthly	Ground water
Sampling of 54 groundwater monitoring wells. Samples are analyzed for volatile organic compounds (VOCs) and metals.	Quarterly (VOCs) Annually (metals)	Ground water
Sampling of Blackberry, Strawberry, and Chicken Creeks. Samples are analyzed for VOCs.	Semi-annually	Surface water
Sampling of groundwater by collecting "grab" samples from all flowing LBL hydraugers. All samples are analyzed for VOCs, and some are analyzed for tritium.	At least once a year	Ground water

Environmental Restoration Group Leader Iraj Javandel (left) watches Environmental Restoration health and safety technicians Susan Monheit and Steve Louie take groundwater samples from a monitoring well near Building 7.

Photo by Steve Adams



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Environmental Restoration Group (continued)

Interaction with Others

The Environmental Restoration Program is an interactive program by its very nature. The Environmental Restoration Program Group Leader is matrixed to EH&S from the Earth Sciences Division (ESD). Technical support for the program is provided primarily by ESD. ESD geologists and hydrologists supervise and conduct field investigations, which are an integral part of the program. They supervise the drilling of borings, installation of monitoring wells, sampling of soil and groundwater, defining the site geology and hydrogeology, characterizing contamination, and assisting in the design and operation of remediation systems. In addition, analytical support services are provided by the ESD in-house laboratory.

The LBL Facilities Department assists the Environmental Restoration Program field personnel in obtaining clearances for drilling and excavations. LBL Facilities Department personnel construct and maintain the groundwater treatment facilities. The Facilities Department also transports drums of soil cuttings and water generated during field activities.

In addition, the Environmental Restoration Group interacts with the following groups in EH&S, other LBL divisions, DOE, and outside regulators:

- Coordinates surface water sampling requirements with EH&S's Environmental Protection Group. Both groups are involved in the LBL environmental surveillance program assessing the level to which LBL research activities affect the population surrounding the laboratory.
- Coordinates disposal of hazardous soil and water encountered during field activities (coordinated with EH&S's Waste Management Group).
- Coordinates Environmental Restoration Program community relations activities with LBL's Office of Planning and Development (OPD). The OPD Community Relations Coordinator provides part-time support to the program.
- Coordinates all Environmental Restoration Program activities with the DOE Environmental Restoration and Waste Management (EM) Organization. EM is responsible for oversight of the program.

Continued on next page.

Environmental Restoration Group (continued)

Interaction with Others (continued)

- Coordinates program activities with the State of California's Department of Toxic Substances Control, the State Water Resources Control Board, the Regional Water Quality Control Board, the East Bay Municipal District, and the City of Berkeley Department of Health Services. The Environmental Restoration Program hosts a quarterly meeting with these regulators and with representatives from the University of California.

Publications for 1992 (new or revised)

Sampling Visit Workplan
LBL RCRA Facility Assessment
Well Management Plan
Data Management Plan
Soil Disposal Plan
Vadose Zone Monitoring Plan
Draft RCRA Facility Investigation Workplan
Groundwater Monitoring Program Plan
Initial Appraisal of the Geologic Controls of Groundwater Occurrence and Movement in the "Old Town" Area of Lawrence Berkeley Laboratory
Initial Appraisal of the Geologic Controls of Groundwater Occurrence and Movement in the "Grizzly" Area of Lawrence Berkeley Laboratory
Environmental Investigations at Lawrence Berkeley Laboratory: Challenges in Tight Formations.

Staff (as of 6/93)

Environmental Restoration Group Leader: I. Javandel

Geotechnical Support Unit

I. Javandel (Acting Manager)	S. Monheit
P. Casey	D. Phillips
E. Gonzalez	T. Tokunaga
P. Holland	H. Wollenberg
H. Holman	A. Yee
P. Johannis	P. Zawislanski
S. Louie	

Planning Unit

J. Thomas (Manager)	J. Denney
E. Aaron	T. Gock-Yuan

Waste Management Group

Overview

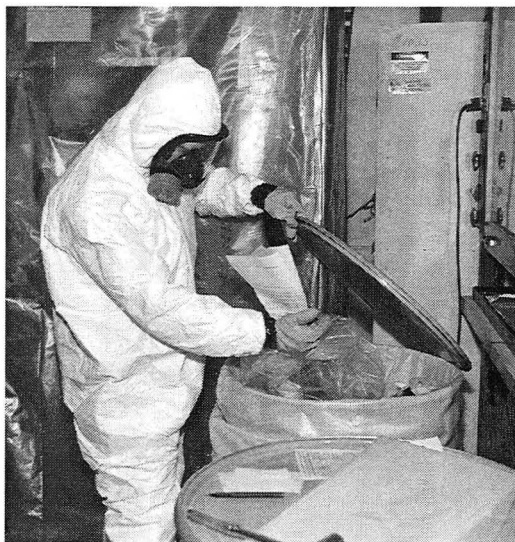
The Waste Management Group is responsible for the following activities:

- operating the Hazardous Waste Handling Facility in a manner that complies with all regulations;
 - removing waste from LBL generators in as safe and efficient a manner possible;
 - minimizing the waste generated at LBL; and
 - complying with all laws and regulations in the operations of the Group.
-

Organization

Over the past two years, the Waste Management Group has experienced extensive organizational changes. Each change has represented an attempt to accomplish the Group's activities in the most efficient manner. The current Waste Management Group is divided into four units:

- Operations—Hazardous Waste
 - Operations—Radioactive and Radioactive Mixed Waste
 - Compliance
 - Waste Minimization and Generator Assistance
-



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Waste Management Technician Holden Herbert packs low-level radioactive waste for shipment to the Hanford, WA radioactive waste storage area.

Photo by Steve Adams

Continued on next page.

Waste Management Group (continued)

Major Accomplishments

During 1992, the Waste Management Group had two major accomplishments:

- Resumed shipments of hazardous waste originating in Radioactive Materials Management Areas (RMMAs)
- Resumed shipments of radioactive and radioactive mixed waste to the Hanford site in Washington.

These accomplishments are in direct response to the moratorium on shipments of these wastes placed on LBL by DOE and the Westinghouse Hanford Company, respectively.

The DOE moratorium was a nationwide moratorium applying to all DOE contractors as a result of the discovery of some uranium-contaminated waste that had been sent from a DOE site to a nonradioactive waste disposal site in Louisiana. As a result of this event, DOE determined that the documentation of hazardous waste originating in RMMAs throughout the DOE Laboratory system was not adequate enough to guarantee that the waste was not radioactive. Thus DOE applied stringent new rules to documenting this waste, listed in the "Performance Objective." The fundamental objective was to ensure that no radioactivity has been added to any hazardous waste originating from DOE sites.

Just how to certify that "no radioactivity" has been added to a unit of waste has been the subject of intense discussion. As of the writing of this report, DOE has not issued any official "release criteria" for this waste, leaving it up to the individual sites to determine their own release criteria. (At LBL, a stringent release criterion—two standard deviations above background—is being used.)

The Hanford moratorium on radioactive waste shipments was a direct result of the Hanford audit of the HWHF in April 1991. At that time, Hanford found that the existing procedures were not sufficient to characterize the radioactive and mixed waste (waste with both radioactive and hazardous components) adequately. In particular, generators of radioactive and mixed waste were not providing documentation adequate to ensure that the waste did not have added hazardous components, thus creating mixed waste.

Continued on next page.

Waste Management Group (continued)

Major Accomplishments (continued)

A third driver for change in Waste Management operations was the Tiger Team visit of 1991. The Tiger Team found that existing Waste Management documentation was inadequate, and they found several other deficiencies in the operation, most relating to the level of formality. (These issues were not unique to Waste Management. The Tiger Team's major findings across all areas at LBL were informality of operations and inadequate documentation.)

As a result of these two moratoria and the Tiger Team visit, the Waste Management Group embarked on a radical upgrade of all documentation and procedures. The new documents were reviewed by DOE in May 1992, and the documentation was found satisfactory to DOE. The Moratorium was formally lifted on July 10, 1992.

The radioactive and mixed waste documentation and procedures were upgraded in parallel with the upgrade in response to the DOE moratorium, and after a successful July 1992 audit, Westinghouse Hanford authorized a resumption of shipments of radioactive and mixed waste to the Hanford site.

The true magnitude of this accomplishment can be realized only when LBL is compared with other DOE sites. LBL is a moderate-sized facility, with a staff much smaller than, say, the comparable staff at Livermore. Yet the waste streams are just as complex as those at a larger site, just smaller in scale. Thus LBL is at a significant handicap: prepare complex documentation with a relatively small staff. In spite of this handicap, at a recent DOE meeting on the Moratorium, LBL was one of only 7 of 36 sites that had had the Moratorium lifted, based on its new documentation. Waste Management should truly be proud of its accomplishments in the past year.

The Waste Management Group also played a major role in the approval of the Part B Permit, the fundamental document needed to operate the Hazardous Waste Handling Facility. Although the Environmental Protection Group provided the lead for this document, Waste Management's input was invaluable in getting this document approved.

Other accomplishments of each Unit in 1992 are listed below.

Continued on next page.

Waste Management Group (continued)

Operations Units

In June 1993 the Operations Unit was divided into two separate units: Hazardous Waste Operations and Radioactive and Mixed Waste Operations. Because Operations was one unit for all of 1992, highlights of both units are described together.

Highlights of 1992 include:

- Resumed shipment of hazardous waste from RMMAs. For 1992, nine shipments of this waste, totalling 2,050 kg (4,519 lbs) were accomplished.
- Resumed shipment of low-level radioactive waste to the Hanford site. In 1992, the first shipment of radioactive waste since 1990 was sent to Hanford, and the groundwork was set for regular shipments in the future.
- Shipped 122,923 kg (271,669 lbs) of hazardous waste originating in areas other than RMMAs.
- Eliminated a backlog of 37 drums (272 cubic feet) of radioactive and mixed waste stored in various laboratories.
- Established a tracking system for radioactive and mixed waste pickup.
- Increased staff from 6 to 15.

The Operations Unit has set as a goal the removal of all waste from laboratories and other generators within five days of receipt of the request to remove the waste. This goal is in spite of the increased requirements for characterization and analysis of the waste.

As was indicated by the DOE and Hanford moratoriums, the burden of waste characterization has increased significantly in the past two years. The fact that the Operations Unit has been able to move waste from the site of generation while still meeting this increased burden is a major accomplishment, and one that all of LBL should be proud of.

Continued on next page.

Waste Management Group (continued)

Compliance Unit

The Compliance Unit has several tasks:

- To ensure that all documentation necessary to ship hazardous, radioactive, and mixed waste from LBL is complete and correct.
- To ensure that all waste shipped from LBL meets all DOE, DOT, and relevant state regulations regarding waste characterization, packaging, and labeling.
- To informally audit the Waste Management Group to make sure that all Waste Management procedures and applicable regulations are being followed.
- To review the Waste Management procedures, in order to determine if any procedures need updating.

The Compliance Unit is a totally new unit: it did not even exist at the start of 1992. So the most significant accomplishment of this unit was its creation, staff hiring, and conversion to a functioning unit. In addition to this fundamental accomplishment, the Compliance Unit also accomplished the following:

- Determined that more than 600 kg of waste originally thought to be hazardous was not hazardous, a significant waste minimization step.
- Hired a Waste Certification Specialist to maintain constant contact with the Hanford, Washington, site (where all of LBL's radioactive and radioactive mixed waste is sent) to ensure that LBL's radioactive and radioactive mixed waste streams are characterized and packaged according to Westinghouse Hanford requirements.
- Began the process of establishing a computerized waste-tracking system (known as "Shoebox") for hazardous waste. The system, expected to begin operation in October 1993, will provide cradle-to-grave tracking of waste and will keep track of all sampling and analysis done to the waste. It will also generate all required reports. Radioactive and mixed waste capabilities are expected to be added in 1994.

Continued on next page.

Waste Management Group (continued)

Compliance Unit (continued)

- Established an interim computerized database for tracking samples of all waste streams, to be used until Shoebox is operating.
 - Began shipments of radioactive and mixed waste to Hanford (the first shipments since the 1991 moratorium).
 - Enabled the Waste Management Group to successfully complete audits by DOE, Westinghouse Hanford, and the California Department of Toxic Substances Control. Compliance Unit records were the key to the successful audits.
-

Waste Minimization and Generator Assistance Unit

This unit was established in June 1993. It has taken the burden of generator assistance from the Operations Units, as well as taking the lead on LBL's waste minimization program. Another major task for 1993 will be to update PUB-3092, the Generator Guides which has served so well the past two years but which is now somewhat out of date.

Waste Minimization was formerly under the Compliance Unit, and its accomplishments in the past year are listed there.

Interaction with Other LBL Divisions

Because of its role, the Waste Management Group is in constant interaction with LBL scientists and support staff. Research at LBL would come to a halt if hazardous, radioactive, and mixed waste was not removed from the laboratories. Educating the waste generators about the new requirements while not alienating them entirely has been a major public relations task. Although the legal requirements are clear, laws are of no value without cooperative generators. The transition to the "new culture" has gone quite smoothly, considering the magnitude of the burden placed on the generators.

Continued on next page.

Waste Management Group (continued)

Publications for 1992

- LBL PUB-5352, *Waste Management Quality Assurance Implementing Management Plan (QAIMP)*, June 1992
- LBL PUB-5353, *Certification Plan, Low-Level Waste, Hazardous Waste Handling Facility*, June 1992
- LBL PUB-5354, *Certification Plan, Radioactive Mixed Waste, Hazardous Waste Handling Facility*, June 1992
- LBL PUB-5355, *Certification Plan, Transuranic Waste, Hazardous Waste Handling Facility*, June 1992
- LBL PUB-5356, *Hazardous Waste Certification Plan, Hazardous Waste Handling Facility*, February 1992
- *Compliance With DOE Performance Objective for Certification of Hazardous Waste as Non-Radioactive*, May 1992
- *Procedures, Hazardous Waste Handling Facility* (contains all procedures applying to the HWHF; 54 were created or revised in 1992)
- *Compliance with DOE Performance Objective for Certification of Hazardous Waste as Nonradioactive* (the "Moratorium Binder")
(**Note:** This binder contains several of the documents listed above; it was prepared to meet the requirements for the lifting of the DOE moratorium on shipment of nonradioactive waste from RMMAs.)
- *Documentation for Westinghouse Hanford's Audit of LBL's Hazardous Waste Handling Facility*, July 21-22, 1992
(**Note:** This binder contains several of the documents listed above; it was prepared to meet the requirements for the lifting of the Hanford moratorium on shipment of radioactive and radioactive mixed waste from LBL.)

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Waste Management Group (continued)

Staff (as of 6/93)	Waste Management Group Leader: T. Wan Assistant: J. Smith
<i>Radioactive and Mixed Waste Operations Unit</i>	M. Lasartemay (Acting Manager) R. Celestre R. DeGuzman B. Johnson J. Johnson
<i>Hazardous Waste Operations Unit</i>	M. OBrien (Manager) H. Herbert S. Leland AETC (contract vendor)
<i>Compliance Unit</i>	S. Jahansooz (Acting Manager) P. Branaman H. Hansen A. Kumarayagam L. Newman
<i>Waste Min./ Generator Assistance Unit</i>	G. Moline (Manager) S. Worsham
<i>Special Projects (Planning)</i>	M. Yao

Environmental Protection Group

Overview

The Environmental Protection Group is responsible for the following activities:

- identifying significant environmental compliance issues that require resolution and coordination, and advising LBL management in a timely manner;
- ensuring that all required environmental permits are secured from the appropriate regulatory agency in a timely fashion;
- establishing and maintaining liaison with appropriate environmental officials to facilitate effective environmental management;
- developing and implementing programs that provide direction to management, enabling management to conduct operations in an environmentally safe manner;
- preparing environmental compliance plans and reports as mandated by laws and regulations;
- preparing budget requests for required environmental protection upgrades and corrective actions;
- curtailing or suspending any operation that poses a clear and present danger to the environment or members of the public;
- investigating environmental releases of hazardous materials; and
- monitoring air emissions and liquid effluents to quantify discharges of hazardous materials and verify compliance with discharge requirements.

Organization

In order to carry out these tasks, the Environmental Protection Group is divided into three units:

- the *Environmental Monitoring Unit*, which is responsible for monitoring of LBL's air, water, and soils
- the *Air/Water Quality Unit*, which oversees compliance activities of air and water quality regulations
- the *Hazardous Materials Management Unit*, which oversees compliance activities of hazardous materials storage and treatment regulations

The 1992 accomplishments of each Unit are listed below.

Continued on next page.

Environmental Protection Group (continued)

Environmental Monitoring Unit

During 1992, the Environmental Monitoring Unit accomplished the following:

- Set up a new automated stormwater sampling system. This is the first sampling system of its type to be installed at LBL.
- Participated in audits and inspections of monitoring activities by the U.S. Environmental Protection Agency (USEPA), the Regional Water Quality Control Board (RWQCB), the California Department of Health Services, the East Bay Municipal Utilities District (EBMUD), and the City of Berkeley.
- Completed the *Environmental Monitoring Plan*, the *Storm Water Monitoring Program*, and the *Storm Water Pollution Prevention Plan*.

The Environmental Monitoring Unit's program elements are summarized in the following table.

Environmental Protection Group Technician Tom Glimme checks a sample of industrial wastewater taken at the fixed treatment unit at Building 77.

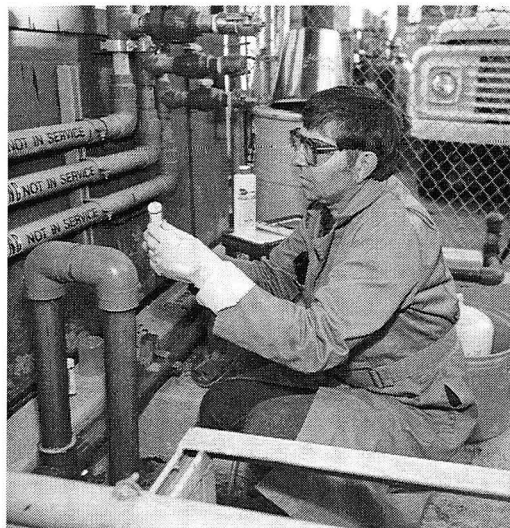


Photo by Steve Adams

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Environmental Protection Group (continued)

Environmental Monitoring Program Elements

Monitoring Activity	Frequency	Effluent
Effluent Monitoring		
Sampling effluent air in all areas where significant quantities of radionuclides are handled. Samples are changed weekly.	Weekly	Air
Sampling of the two LBL sewer outfalls. Outfall flow is measured at each site. Composite samples are analyzed for tritium, radioiodines, and gross alpha and beta emitters.	Weekly	Waste-water
Environmental Surveillance		
Monitoring of penetrating radiation at four perimeter stations and in each major accelerator complex (to quantify the impact of LBL accelerator operations). Data from the perimeter and accelerator stations are telemetered to a central location and collected by a computerized data acquisition system.	<u>Continuous:</u> gamma and neutron flux; <u>Weekly:</u> particulates, tritium, and radioiodines	Air
Sampling and analysis of 24-hour composites from the two sewer outfalls and LBL's two plating shops for a series of regulated metals. "Grab" samples are analyzed for pH, chlorinated hydrocarbons, oil and grease, cyanide, phenols, total suspended solids, and filterable chemical oxygen demand. Nonradiological assays are mandated by LBL's sitewide wastewater discharge permit.	24-hour composites once every 2 or 3 months (stated on permit)	Waste-water
Continuous sampling of environmental air at ten points onsite and at five offsite and perimeter locations. Fourteen of the sites sample for particulate matter, eight for tritiated water (HTO), four for radioiodine, and one for $^{14}\text{CO}_2$. Samplers are changed weekly.	Weekly	Air
Sampling of rainfall and dry deposition at nine onsite and four perimeter locations. Two additional sites are sampled whenever there is a significant rainfall. The rainwater is analyzed for tritium and gross alpha and beta activity.	Monthly	Air
Sampling of groundwater by collecting "grab" samples at six LBL hydraugers and at five of the creeks that drain the LBL watershed. The samples are analyzed for tritium and gross alpha and beta emitters.	<u>Monthly:</u> hydraugers; <u>Weekly:</u> creeks	Water
30-minute composite sample at the start of a storm event, plus additional "grab" samples from creeks and streams. Samples analyzed for gross alpha, beta, tritium, metals, organics, oil/grease, gasoline, and diesel.	First storm event, plus at least one other	Water

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Environmental Protection Group (continued)

Air/Water Quality Unit

During 1992, the Air/Water Quality Unit accomplished the following:

- Prepared a large number of reports required by various agencies. (See page 2-21 for a complete list.)
- Participated in LBL-wide projects of significance, including
 - preparation of the Supplemental Environmental Impact Report, required for renewal of the contract between DOE and the University of California's Office of the President for continued operation of LBL, and
 - completion of the ALS Operational Readiness Review prior to startup of this new facility.
- Participated in audits and inspections by various agencies, including
 - inspections of stationary air emission sources by the Bay Area Air Quality Management District (BAAQMD),
 - radioactive air emission sources by USEPA, and
 - wastewater discharge sources by EBMUD and USEPA.
- Applied for additional permits from regulatory agencies for air emission sources and stormwater discharges.
- Provided all necessary documentation to respond to notices and reports of violations by various agencies, including six Notices of Violation of the Clean Water Act, issued by EBMUD and two Notices of Violation of the Clean Air Act, issued by BAAQMD . All violations have been corrected adequately.

Continued on next page.

Environmental Protection Group (continued)

Hazardous Materials Management Unit

During 1992, the Hazardous Material Management Unit accomplished the following:

- Prepared a large number of reports required by various agencies. (See page 2-21 for a complete list.)
- Participated in audits and inspections by various agencies, including underground tank inspections by the City of Berkeley.
- Provided all necessary documentation to respond to notices and reports of violations by various agencies, including a Notice of Potential Liability because of 13 PCB drums from LBL discovered at a potential Superfund site. The situation was cleared up adequately, so that LBL will not be held liable for any cleanup costs.
- Provided information needed to operate five treatment units under the State of California's new tiered permitting system.
- Submitted (to the City of Berkeley) closure plans for two underground storage tanks
- Took lead responsibility for the production of the Part B Permit. This huge document (five large volumes in its final size) is the document necessary for LBL's Hazardous Waste Handling Facility to operate.

Interaction with Other EH&S Groups

The Environmental Protection Group supported and interacted with the following groups in EH&S:

- Supervised the production of the Part B Permit, without which the Hazardous Waste Handling Facility would be unable to operate. Without an operating HWHF, all research at LBL would come to a standstill due to the buildup of hazardous wastes.
- Supervised preparation of Five-Year Plan Activity Data Sheets for waste-minimization and waste-generator support activities.

Continued on next page.

Environmental Protection Group (continued)

**Publications
for 1992 (new
or revised)**

- *LBL Underground Storage Tank Management Plan*
- *LBL Underground Storage Tank Response Plan*
- *LBL Environmental Monitoring procedures (8)*
- *LBL Underground Storage Tank Monitoring Procedure*
- *DOE Environmental Five-Year Plan*
- *DOE Annual Site Environmental Report*
- *DOE Effluent Summary Report*
- *DOE Environmental ALARA Program*
- *DOE Environmental Monitoring Plan*
- *DOE Occurrence Reports (for environmental incidents)*
- *DOE Performance Indicator Report (for environmental air emissions and wastewater discharges)*
- *EPA Spill Prevention Control and Countermeasures Plan*
- *EPA Radionuclide Air Emission Annual Report*
- *EPA Quarterly NESHAP Compliance Progress Report*
- *EPA Annual PCB Report*
- *Cal/EPA Fixed Treatment Unit Plans*
- *RWQCB Storm Water Pollution Prevention Plan*
- *RWQCB Storm Water Monitoring Plan*
- *RWQCB Annual Storm Water Monitoring Report*
- *EBMUD Self-Monitoring Reports*
- *EBMUD Semiannual Effluent Meter Calibration Report*
- *EBMUD Semiannual Hazardous Waste Off-Haul Report*
- *EBMUD Photoprocessing Discharge Prevention Compliance Report*

Continued on next page.

Environmental Protection Group (continued)

Publications for 1992 (new or revised) (continued)

- *EBMUD Radiator Shop Discharge Prevention Compliance Report*
- *BAAQMD Annual Information Update Program Report*
- *City of Berkeley Underground Storage Tank Annual Precision Leak Test Report*
- *City of Berkeley Underground Storage Tank Quarterly Leak Monitoring Report*

Other Documents Prepared in 1992

Preliminary Assessment/Site Inspection package (to US/EPA)

Request for Information (to Cal/EPA's Department of Toxic Substances Control, for information regarding the Bay Area Drum Site in San Francisco)

Part B Permit (supervised)

Air emission permits (18)

Hazardous waste treatment permits (5)

Wastewater discharge permits (3)

Stormwater discharge permit (1)

Staff (as of 6/93)

Environmental Protection Group Leader: R. Pauer

Environmental Protection Group Administrator: S. Wyrick

Environmental Monitoring Unit

D. Balgobin (Manager)
 T. Donovan
 V. Montoya
 R. Yow

Air/Water Quality Unit

P. Thorson (Manager)
 G. Lackner
 G. Schleimer

Hazardous Materials Management Unit

R. Pauer (Acting Manager)
 R. Cummings (20% time)
 R. Fox
 C. Smith

3. The Health Department

Departmental Overview

Mission The mission of the Health Department is to ensure the occupational health of all LBL employees.

Groups In order to accomplish this mission, the Department is divided into four Groups:

- Health Services
- Industrial Hygiene
- Radiation Assessment
- Analytical Services

The Health Department organization chart appears on the next page. Details of each Group's activities are provided on the following pages.

**Summary of
Department
Services**

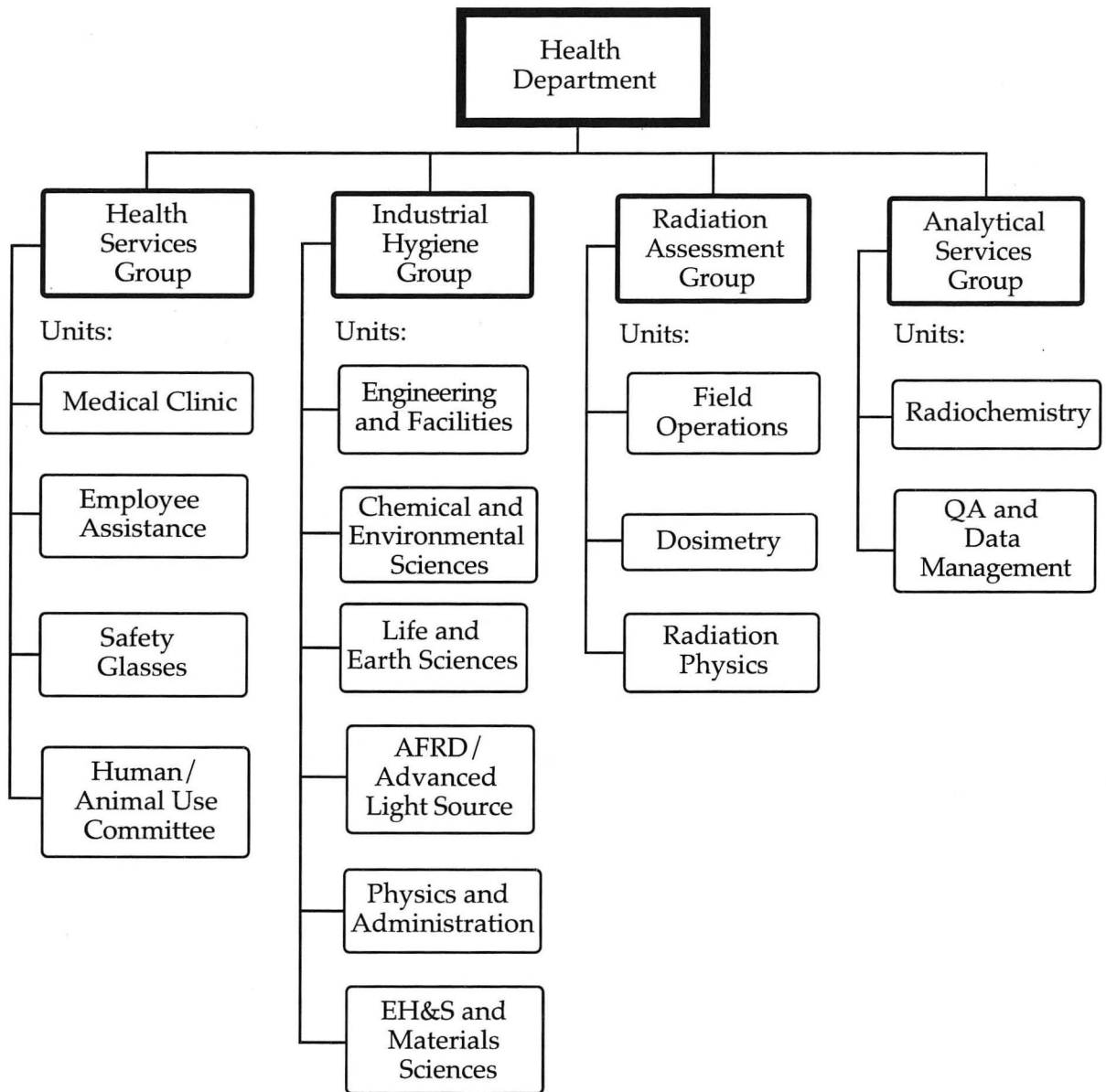
The Health Department provides the following support services to all LBL employees:

- Assures that all operations and activities involving sample analysis are performed in a safe, responsible, and fully compliant manner.
 - Assures that all LBL operations involving the use of radiation are carried out according to regulatory standards through consultation and assessment.
 - Conducts analyses and provides data for external and internal radiation exposure and for environmental monitoring.
 - Guides and facilitates the implementation of industrial hygiene safety programs such as ventilation, noise/sound, and chemical and biological hazards.
 - Provides preventative and occupational health services, such as periodic medical exams for all LBL staff, emergency medical response, and treatment.
 - Provides employees with referrals for personal guidance and assistance.
 - Provides oversight of human, animal, and radioactive drug use to meet regulatory requirements.
-

Continued on next page.

Departmental Overview (continued)

Health Department Organization Chart



Health Services Group

Summary of Activities

The Health Services Group provides an occupational medical program for LBL staff and visitors that meets the requirements of the Department of Energy and other Federal agencies, and that conforms to the standards of the health professions and laws of the State of California.

The specific objectives of the Health Services Group are to

- provide preventative and occupational health services, such as periodic medical exams for all LBL staff;
- provide emergency medical response and treatment;
- provide personal guidance through the Employee Assistance Program;
- provide oversight of the Human and Animal Use regulatory committees;
- provide assistance to management in protecting employees from health hazards in the workplace; and
- aid management in assuring the placement of employees in work that can be performed in a reliable and safe manner consistent with the requirements of the Americans with Disabilities Act of 1990.

Organization

In order to carry out these tasks, the Health Services Group is divided into four units:

- Medical Clinic
- Employee Assistance
- Safety Glasses
- Human/Animal Use Committees

Continued on next page.

Health Services Group (continued)

- Accomplishments for 1992**
- A screening program for early detection of cancer was established.
 - Through the efforts of the Employee Assistance Program, stress claims at LBL decreased.
 - A wellness program was established.
-

Interaction with Others

Because the Health Services Group is responsible for the health of all LBL employees, the Group's staff interact frequently with all LBL employees. Specifically:

- The Medical Clinic provides routine annual health checkups to all LBL employees, and handles drop-in and emergency care for a large number of employees.
 - The Employee Assistance Program provides a wide range of services to many LBL employees on a confidential basis.
 - The Safety Glasses Program provides safety glasses to LBL employees as needed.
 - The Human and Animal Use committees monitor all research at LBL for ethical treatment of subjects, thus affecting a significant percent of the LBL population.
-



Nursing Supervisor Nancy Bradfield-Montoya discusses the results of the vital-capacity test with LBL employee Bob Stokstad during his annual checkup

Photo by Steve Adams

XBB 930-8008

Continued on next page.

Health Services Group (continued)

Publications C.E. Grondona, *Lead Revisited: A Case Study on Lead Exposed Painters*, AAOHN Journal **41** (1), pp. 33-38 (1993).

Staff (as of 6/93) Health Services Group Leader: H. Stauffer
Deputy: C. Grondona

<i>Medical Clinic Unit</i>	H. Stauffer (Manager)	J. Kody
	C. Bochra	B. Russel
	N. Bradfield/Montoya*	Y. Sang-Liu
	W. Donald	L. Scudero
	C. Grondona	L. Snow

*Employee
Assistance Unit* K. Handron

*Safety Glasses
Unit* N. Dietrich

*Human/Animal
Use Committees* C. Byrne

*Nursing Supervisor

Industrial Hygiene Group

Overview

The Industrial Hygiene Group provides advice, technical support, evaluation, and oversight to operating groups to protect the health and safety of LBL employees and visitors. Core activities include identification of potential chemical, physical, biological, and ergonomic hazards.

The Group is also responsible for guiding and facilitating the implementation of industrial hygiene safety programs, such as asbestos removal, respiratory protection, ventilation, noise/sound, and confined-space entry.

Organization

In order to carry out these tasks, the Industrial Hygiene Group is divided into six units, with each unit having oversight responsibility for the program divisions described by the unit's title:

- Engineering and Facilities
 - Chemical and Environmental Sciences
 - Life and Earth Sciences
 - AFRD/Advanced Light Source
 - Physics and Administration
 - EH&S and Materials Sciences
-

Accomplishments for 1992

- Specific staff members were hired and assigned to specific oversight areas, as described above.
 - Monitoring equipment was obtained to cover all industrial hygiene-related hazardous agents at LBL.
 - Training was provided to approximately 600 LBL employees in asbestos hazards, lead hazards, bloodborne pathogens, chemical health and safety programs, and respirator safety.
 - Industrial hygiene staff assisted the Facilities Department on fume hood upgrades.
 - A written lead program was completed and distributed to affected LBL employees.
-

Continued on next page.

Industrial Hygiene Group (continued)

- Accomplishments for 1992 (continued)**
- A comprehensive asbestos abatement program is being implemented Labwide.
 - Confined spaces have been identified and labeled where appropriate throughout LBL. Workers have been trained in confined-space entry; a permit entry system has been developed and implemented; and a written program has been developed, approved, and distributed to affected LBL employees.
 - A comprehensive Chemical Hygiene and Safety Plan was completed and distributed. Training on the plan has begun.
-

Interaction with Others Because the Industrial Hygiene Group is responsible for directing programs for the occupational health and safety of all LBL employees, the Group's staff interact frequently with all LBL employees. Specific examples are described in the Accomplishments section above.

- Publications**
- Chemical Hygiene and Safety Plan (LBL PUB-5341)
 - *Laboratory Chemical Hygiene and Safety Training* (manual for EH&S Course 348, Laboratory Chemical Hygiene and Safety Training)
 - Respiratory Protection Program
 - Confined Spaces Program
 - Asbestos Management Program
 - Lead Program TRD
-

Staff (as of 6/93) Industrial Hygiene Group Leader: J. Rosen
Deputy: B. King
P. Blodgett (Life and Earth Sciences)
R. Connelly (Chemical and Environmental Sciences)
P. Davis (Engineering and Facilities)
B. King (EH&S and Materials Sciences)
W. Pearce (Physics and Administration)
G. Perdue (AFRD/Advancee Light Source)

Radiation Assessment Group

Overview

The primary mission of the Radiation Assessment Group is to assist and advise LBL program operations on radiation safety. In order to accomplish this mission, the Group provides comprehensive radiation protection support and services in the following areas:

- personnel dosimetry
- radioactive materials transportation
- machine health physics
- radiation instrument calibration and maintenance
- radioactive materials evaluation
- facility evaluation
- site and facility radiation protection surveys
- radiation protection training

The Radiation Assessment Group provides leadership and oversees these services in order to

- ensure adherence to the LBL radiation protection plan and the EH&S mission;
- promote consistent and effective compliance with DOE orders;
- assist management in providing a radiologically safe working environment for all LBL employees and guests; and
- interact with LBL management, program managers, and project leaders to assist and ensure that EH&S objectives are integral to project operations and that EH&S recommendations have a sound technical and scientific basis.

Organization

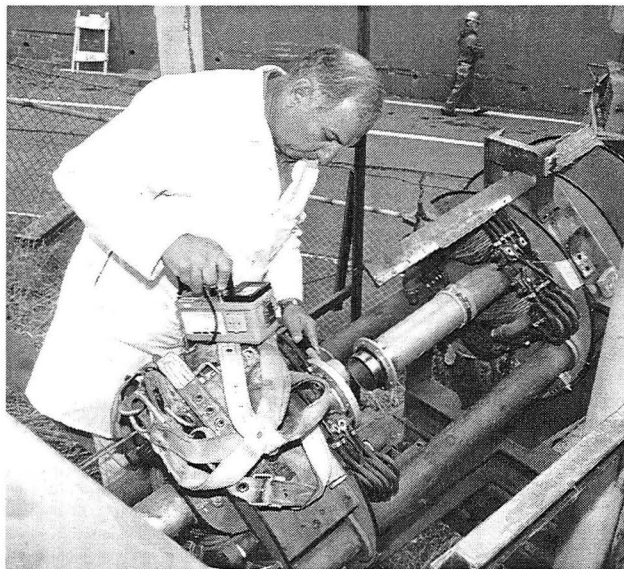
In order to carry out these tasks, the Radiation Assessment Group is divided into three units:

- Field Operations
- Dosimetry
- Radiation Physics

Continued on next page.

Radiation Assessment Group (continued)

- Accomplishments for 1992**
- Radioisotope uses Labwide were documented and assessed via the newly developed Project Review and Radioisotope Permitting Program.
 - Consistent hazards analyses and risk-based requirements were developed for controls and safety systems for bioassay, air monitoring, and glove boxes.
 - Comprehensive radioisotope lab audits are now being performed quarterly.
 - A program was developed to provide better feedback and assistance to researchers regarding compliance with LBL and DOE policy. This program has led to better preparation for DOE audits.
 - Procedures requiring more safety planning were identified.
 - Radiation worker training and refresher training in compliance with DOE regulations was established. As a result of this training, radiation workers are now more aware of DOE safety requirements with respect to radionuclides.
-



Glenn Garabedian, Field Operations Supervisor, checks a magnet for induced radiation as part of the dismantling of the Bevelac.

Photo by Don Fike

XBB 938-5272

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Radiation Assessment Group (continued)

Interaction with Others

Because the Radiation Assessment Group is responsible for the radiation safety of all LBL employees and projects, the Group's staff interact frequently with all LBL employees who use radioactive materials in their research. Specifically,

- The Field Operations Unit provides evaluations of projects that involve radioactive materials, surveys of sites and items for radioactivity, and transportation of radioactive materials, all of which result in interactions with a wide range of LBL employees.
- The Dosimetry Office provides dosimetry services to all LBL employees that may be exposed to radioactivity.
- The Radiation Physics Unit provides shielding assessments and radiation transport analysis to LBL program facilities.

Publications for 1992

Radiological Control Manual, LBL PUB-3113, May 5, 1993

Continued on next page.

Radiation Assessment Group (continued)

Staff (as of 6/93)	Radiation Assessment Group Leader: R. Kloeppling Deputy: M. Schoonover	
<i>Field Operations Unit</i>	M. Schoonover (Manager) G. Buck H. Collins G. Garabedian J. Hayes K. Heinzlman	B. Hemphill C. Huff B. Muhammad D. Ryan P. Vargha
<i>Transportation Unit</i>	D. Harvey (Manager) D. Gregorson	
<i>Personnel Dosimetry Unit</i>	K. Dinnel (Manager) S. Chatterji* S. Crafton N. Greenhouse	G. Jones H. Lee K. Washington
<i>Radiation Physics Unit</i>	R. Donahue (Manager) T. de Castro	
<i>Special Projects</i>	R. Sun	
<i>Administrative Support</i>	L. Siewert	

*Now at Stanford Linear Accelerator Center, Stanford, CA.

Analytical Services Group

Overview

The Analytical Services Group assures that all operations and activities involving sample analysis are performed in a safe, responsible, and fully compliant manner.

Specifically, the Analytical Services Group processes samples for analytical results. These results are tracked via electronic data bases and reported according to DOE guidelines. The results are used to determine if the materials being tested are radioactive.

The Analytical Services Group also maintains a comprehensive quality assurance program, and it participates in nationwide DOE and EPA quality assurance and certification programs.

Organization

In order to carry out its mission, the Analytical Services Group is divided into two units:

- Radiochemistry
 - QA and Data Management
-

Accomplishments for 1992

The Analytical Services Group was formed in 1993 by merging the Laboratory Analysis Unit of the Environmental Protection Group and the Bioassay Unit of the Health Services Group. Hence the Group did not exist as a group in 1992. Group accomplishments will be listed in future Annual Reports.

Continued on next page.

Analytical Services Group (continued)

**Interaction
with Others**

The Analytical Services Group interacts frequently with other EH&S groups, specifically the Environmental Protection and Waste Management groups of the Environment Department and the Radiation Assessment Group of the Health Department. These analytical results are critical in determining whether the tested items may be released as nonhazardous or nonradioactive, or whether the item must be disposed of as hazardous, radioactive, or mixed waste.

The Analytical Services Group also performs internal bioassay analysis to monitor personal exposures for the Dosimetry Office in the Radiation Assessment Group.

Staff (as of 6/93)

Analytical Services Group Leader: J. Floyd
Deputy: A. Davi

**Radiochemistry
Unit**

A. Davi (Manager)
R. Drisdale
T. Eberman
S. Gunn
N. Kusubov
D. Yaeger

**QA and Data
Management
Unit**

A. Davi (Acting Manager)

4. The Safety Department

Departmental Overview

Mission

The goal of the Safety Department is to provide the finest safety, fire protection, and emergency support services possible.

The Safety Department Office manages and coordinates the activities of the Safety Department. These activities include budget development and administration, and personnel management with direct supervision of group leaders and administrative staff. The Department office functions as a liaison to DOE, outside regulators, and other departments at LBL in the areas of fire services, emergency services, and occupational safety.

Groups

In order to accomplish its mission, the Department is divided into three Groups:

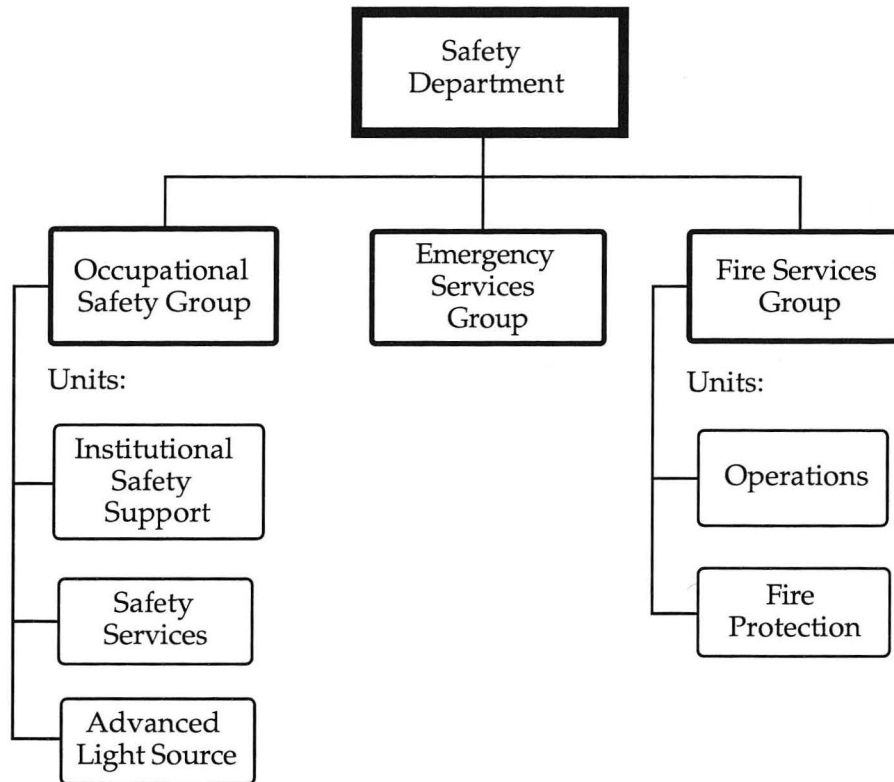
- Occupational Safety
- Emergency Services
- Fire Services

The Safety Department organization chart is shown on the next page. Details of each Group's activities are provided on the following pages.

Continued on next page.

Departmental Overview (continued)

Safety Department Organization Chart



Occupational Safety Group

Overview

The Occupational Safety Group provides the LBL community with support services that enhance LBL's capability to conduct safe, efficient operations and to ensure compliance with DOE and other regulatory agencies.

The Group carries out its mission in the following ways:

- Developing, coordinating, and managing LBL safety programs.
- Conducting risk assessments of the work environment, equipment, and procedures through site surveys and field assessments, and by reviewing Activity Hazard Documents.
- Reviewing designs and drawings in order to evaluate construction plans.
- Recommending corrective actions, work procedures, and protective equipment to mitigate identified hazards.
- Auditing programs and operations to assess regulatory compliance.
- Investigating accidents and occurrences.
- Developing and maintaining statistical data for analysis of the frequency and severity ratio of accidents at LBL.
- Training LBL personnel in relevant safety requirements and practices.
- Providing consultative services to LBL management and staff.
- Maintaining liaison activities with DOE and other agency personnel.

Organization

The Occupational Safety Group consists of the following components:

- Institutional Safety Support
- Safety Services
- Advanced Light Source
- Matrix support to the Advanced Light Source, Facilities, and Engineering

Continued on next page.

Occupational Safety Group (continued)

Group Functions The Occupational Safety Group performs the following functions in support of its mission:

Program Management

Develop, coordinate, and manage comprehensive safety programs to ensure that DOE and other regulatory requirements are implemented in the following areas:

- accident investigation
- lockout-tagout
- laser
- engineering and design
- construction
- pressurized gases
- equipment and machine safeguarding
- material handling and storage
- walking and working spaces

Hazard Identification and Resolution

- Assist LBL personnel in developing a safe, efficient work environment and appropriate procedures through consultations, site visits, facility inspections, and activity hazard reviews to identify potential hazards and evaluate risks.
- Provide recommendations to enhance operational safety and to implement DOE and other applicable regulatory requirements.

Training

- Develop and conduct formal and incidental training to provide LBL personnel with relevant safety information.

Information Dissemination

- Maintain technical expertise and knowledge of current regulatory requirements, consensus standards, and pending developments.

Accident/Occurrence Investigation

- Disseminate occupational-safety information to all LBL employees, guests, and visitors, as appropriate.
- Investigate and/or assist line management in accident, incident, and occurrence investigation and reporting.
- Assist in the identification of causal factors and the development of plans to minimize the potential for similar occurrences.

Continued on next page.

Occupational Safety Group (continued)

Group Functions (continued)

Consultative Services Provide a wide variety of safety-support services intended to enhance the development of safe, efficient work environments and procedures.

DOE and Outside Agency Liaison Serve as a contact with DOE and other regulatory and professional organizations to facilitate

- exchange of information,
- arrangement of visits, audits, and appraisals, and
- development of inter-organizational working relationships

Accomplishments for 1992

- Developed laser and electrical safety programs.
- Developed a safety program for the Advanced Light Source.
- Enhanced the accident and incident reporting program.
- Enhanced the occurrence reporting program.

Staff (as of 12/93) Occupational Safety Group Leader: P. Johnson
 K. Barat (laser safety, nonionizing radiation, ALS, roads and traffic)
 T. Barton (construction)
 J. De Maria (administrative services, general information)
 K. Dixson-White (DOE/OSHA record keeping, accident reporting, statistical data, safety shoes)
 K. Gershon (electrical safety, lockout/tagout)
 S. Kelly [occurrence reporting, ergonomics/office safety, material handling (office)]
 M. Kotowski (cryogenics)
 E. Moore (ergonomics)
 M. Ow [OSHA, lessons learned, construction safety, pressure safety, material handling (shops and laboratories)]
 A. Pramanik (engineering—matrixed)
 D. Williams (machine guarding, performance indicators, accident investigation, seismic safety)

Emergency Services Group

Summary of Activities

The Emergency Services Group is responsible for LBL's Emergency Preparedness Program. The LBL Emergency Preparedness Program is a long-standing program. It benefits from strong support by LBL management, voluntary cooperation by the staff, and dedicated efforts by first-responder groups, both professional and volunteer. Significant accomplishments have been made in the last year, and ongoing programs are addressing relevant Tiger Team corrective actions. All approved milestones have been met, and some are ahead of schedule. The Laboratory is committed to providing resources to maintain the current level of activity, and additional resources have been programmed for the future to allow LBL to meet the new requirements of DOE Order 5500.3A, *Planning and Preparedness for Operational Emergencies*.

The Emergency Services Group has a Laboratory-wide responsibility for developing and implementing LBL's emergency preparedness policy. Functions of the Emergency Services Group are:

- developing and updating the LBL Master Emergency Plan
- developing and updating Building Emergency Plans
- planning and conducting emergency drills and exercises
- coordinating volunteer emergency teams, including
 - building emergency teams
 - auxiliary ambulance and fire teams
 - ham radio operators
 - auxiliary medical team
 - traffic control team
 - damage assessment teams
- maintaining the LBL Emergency Command Center
- managing emergency supplies, including disaster rescue boxes, first aid kits, and emergency food
- providing emergency preparedness training in the form of first aid, CPR, fire extinguisher use, emergency team training, and earthquake safety
- coordinating emergency preparedness functions with State and local jurisdictions and agencies.

Continued on next page.

Emergency Services Group (continued)

Regulatory Drivers

The functions and mission of the Emergency Services Group are mandated or regulated by the following DOE orders:

- DOE Order 5500.1B, *Emergency Management System*
 - DOE Order 5500.2B, *Emergency Categories, Classes, and Notification and Reporting Requirements*
 - DOE Order 5500.3A, *Planning and Preparedness for Operational Emergencies*
 - DOE Order 5500.10, *Emergency Readiness Assurance Program*
-

Responsibilities

- The *Laboratory Director* is responsible for ensuring that LBL's, health, safety, and emergency preparedness policies are carried out.
 - LBL's *Associate Laboratory Director for Operations* has been delegated the authority to develop and administer the Laboratory health and safety program.
 - In turn, the Associate Laboratory Director for Operations has delegated responsibility for health and safety administration or policy to the *EH&S Division Director*, and thence to the *heads of the Environment, Health, and Safety departments* within EH&S.
 - Responsibility for the overall administration of the Emergency Management Program—including the Master Emergency Plan (MEP), Emergency Readiness Assurance Program (ERAP), and annual updates for both—has been delegated to the *Emergency Services Group Leader*. Consequently, development of procedures and/or implementation guides, training, and exercises pertinent to either the MEP or ERAP are the responsibility of the Emergency Services Group Leader.
-

Resources

Upon the retirement of the former LBL Emergency Preparedness Coordinator in October 1991, a replacement was hired in January 1992. Heretofore, this was the only authorized full time position in the Emergency Preparedness program. An administrative assistant position was authorized and filled in April 1992. The current budget allows the program to maintain a constant level of progress and improvement.

Continued on next page.

Emergency Services Group (continued)

Training

The LBL Emergency Preparedness Training Program is performance based and focuses on skills required to exercise the Master Emergency Plan. The program includes both individual and collective training. Training may be conducted on and off site and includes classroom work, drills, and exercises.

**Training
Documentation**

The Emergency Preparedness Coordinator develops an annual training plan for the organizations that comprise the emergency response organization. The training plan includes a schedule of training sessions and drills and exercises. The training sessions are conducted in accordance with a lesson plan or outline, as described in the MEP. When training has been completed, it is entered into the training database on LBL's FOCUS Training Data Base system. This system establishes the audit trail for emergency preparedness training. The central training database is accessible by all division members and is used as part of the self-assessment process. The FOCUS Training Data Base was brought on line in 1992, replacing SPIRES, which had been used for many years. FOCUS is more user friendly and allows easier access by other divisions.

**Significant
Accomplishments**

The following significant accomplishments were completed in 1992.

**Master
Emergency Plan**

In accordance with DOE Order 5500.3A and Tiger Team corrective actions, LBL has launched an ambitious program to revise the MEP. One 75% temporary employee was dedicated to this project from April through September 1992. A final draft is expected to be completed by June 1993. While the plan is predicated upon a detailed hazard analysis, LBL believes its greatest credible hazard is a natural disaster, specifically an earthquake on the Hayward Fault. A detailed analysis of the earthquake scenario is included in the revised MEP. This scenario could trigger secondary events such as hazardous material spills or releases. Based on this assumption, LBL has proceeded with the revision of the MEP. A concurrent action is a radiological and chemical hazard analysis, since these could be secondary events during a natural disaster. Upon completion of this hazard analysis, it will be incorporated by reference into the plan.

Continued on next page.

Emergency Services Group (continued)

Significant Accomplishments (continued)

Drill and Exercise Program Drills and exercises are an integral part of the LBL Emergency Preparedness program. They are conducted to provide emergency response training and to evaluate the Laboratory's capability to respond effectively to an emergency. Analysis of the results of an exercise provides the basis and information necessary for improving weak areas and emphasizing actions required in emergency situations. Emergency drills and exercises require substantial effort to effectively plan and coordinate.

To adequately train personnel or validate the adequacy of operational procedures and emergency plan implementing procedures, a realistic scenario and proper control must be used for the drill or exercise. The Emergency Services Group sought and received approval from the Director's Action Committee to implement a Drill and Exercise Program beginning in October 1992. One drill and exercise, a fire and consequent hazardous material spill in Buildings 62 and 66, was completed in October 1992. Three more exercises were scheduled for 1993 (two of which were complete by May 1993).

LBL Emergency Command Center Upgrade The Command Center is located in the Training Room of the Fire Station (Building 48). This is a dual-purpose room that can be easily converted from its daily use as a training room to the Emergency Command Center. The ECC has emergency communications capability through the Fire Department Dispatch Center located in the same building. Additional telephones have been installed, and a base station for communicating with building managers is located in the ECC. During the past year significant upgrades and improvements have been made to the ECC. Additional telephones have been installed to allow each ECC Team Member access to a phone. A dedicated line between the ECC and the Fire Dispatch Center was added. Additional maps, checklists, and administrative supplies were included in the upgrade.

Continued on next page.

Emergency Services Group (continued)

Significant Accomplishments (continued)

Emergency Plans

- Emergency plans for Campus Buildings 1 and 3 were revised in accordance with the Memorandum of Understanding with the Berkeley Campus.
- Emergency plans for Buildings 75, 51, 70/70A, and the ALS complex (Buildings 6, 10, and 80) were revised and published.
- An analysis of the urban-wildland fire threat resulted in the recommendation that LBL develop a site evacuation plan. A draft of the plan has been developed.

Earthquake Month Activities

- Conducted a "duck and cover" drill.
- Set up displays and provided brochures on earthquake preparedness in several major Laboratory buildings.
- Arranged to have an emergency supplies vendor in the cafeteria lobby for one day.
- Sponsored a lunch hour speaking engagement in the Building 50 auditorium. Henry Renteria, Director of Emergency Services for the City of Oakland, spoke about the Loma Prieta earthquake and the Berkeley Hills fire.

Individual Training

LBL offers first aid, CPR, earthquake safety, and fire extinguisher training to all employees. The following training and orientation classes were held in 1992:

- 34 Building Emergency Team Members were trained in basic Building Manager duties and responsibilities.
- 348 employees were trained in CPR.
- 255 employees were trained in first aid.
- 109 employees were trained in earthquake safety.
- 262 employees were trained in the use of fire extinguishers.
- All volunteer response teams (Amateur Radio, Ambulance, Firefighting, First Aid, and Traffic Control) met for orientation and training as scheduled.

Continued on next page.

Emergency Services Group (continued)

Interactions with Other Groups

The Emergency Services Group interacted with other EH&S groups and LBL divisions in several ways, including

- providing the Labwide training classes described above
 - preparing emergency plans for LBL staff Labwide
 - providing public outreach through earthquake month activities
-

Publications

Building Emergency Plan, Building 1 (Draft)

Building Emergency Plan, Building 3 (LBL PUB-512)

Building Emergency Plan, Building 75 Complex (LBL PUB-521)

Building Emergency Plan, Buildings 70/70A (LBL PUB-524)

*Building Emergency Plan, ALS Complex (Buildings 6, 10, and 80)
(LBL PUB-529)*

Building Emergency Plan, Building 51 (LBL PUB-518 Rev.)

Staff (as of 6/93)

Emergency Services Group Leader: D. Bell

M. Turner

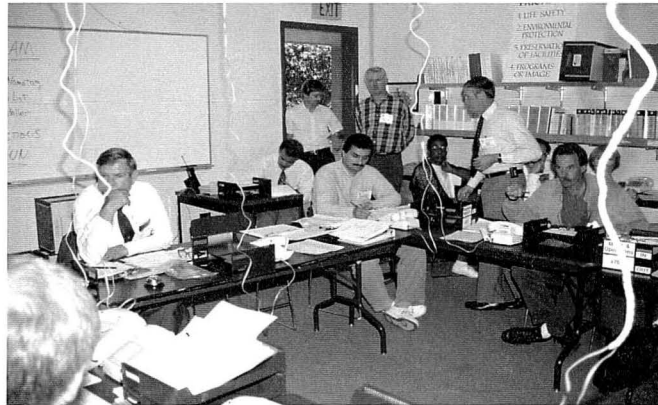
Earthquake Drill, May 1993

In May 1993, the LBL Emergency Services Group conducted a full earthquake drill, including all of the various elements that make up the Emergency Team. These photos show various aspects of the drill.



Emergency Team members comfort a "victim" in front of Building 90.

The Emergency Command Center during the drill.



The Fire Department was a major drill participant.

Photos by Don Fike.

Fire Services Group

Mission The Fire Services Group is responsible for protecting LBL employees and property from destruction from fires and related perils through direct action and effective coordination of Fire Services Resources.

Overview of Group The LBL Fire Protection program is a comprehensive program designed to provide engineering, technical, and emergency response services for LBL. In addition to the administrative section, the Fire Services Group consists of two functional units:

- Operations Unit
- Fire Prevention Unit

The accomplishments of each unit are listed on the following pages.

Administration The Fire Services Group underwent a change in leadership this past year. After seven years of dedicated services, Robert E. Rhoades retired as LBL Fire Chief. He was replaced by Billy P. White, a veteran fire officer with 33 years service with the City of Berkeley. Chief White was appointed LBL Fire Chief on December 14, 1992.

Regulatory Drivers The LBL Fire Protection program is mandated or regulated by several DOE Orders, including the following:

- DOE Order 5480.4, *Environmental Protection, Safety & Health Protection Standards*
 - DOE Order 5480.7, *Fire Protection*
 - DOE Order 5480.8, *Contractor Occupational Medicine Program*
 - DOE Order 5500.3A, *Planning and Preparedness for Operational Emergencies*
 - DOE Order 6430.1A, *General Design Criteria*
-

Continued on next page.

Fire Services Group (continued)

Operations Unit

The Operations Unit, managed by the Assistant Fire Chief of Operations under authority of the Fire Chief, is responsible for the following operations:

- emergency response and control of fire, explosion, and hazardous material incidents
 - administration of emergency medical care and transportation for LBL personnel
 - operation and maintenance of the LBL fire alarm receiving station and dispatch center
 - conduction of facility, fire, and life-safety inspections
 - inspection and maintenance of LBL fire extinguishers
 - training for auxiliary fire and ambulance crews involving firefighting and emergency medical-management techniques.
-

Operations Unit Accomplishments

- Developed and implemented a new pre-incident planning policy and procedure to assure effective Fire Services Group operational control of emergency situations at potential target facilities. Pre-incident plans provide Fire Services Group personnel with useful information regarding particular hazards, buildings, configurations, occupant loads, and fire protection features.
 - Contributed significant information about emergency operations, availability of mutual aid assistance, and procedural aspects leading to the completion of the HWHF Part B Permit.
 - Participated in the joint wildland fire training program, along with the Berkeley Fire and Emergency Services Department and the East Bay Regional Parks Fire Department. This training will allow LBL firefighters to work in a consolidated effort with the surrounding fire departments in order to fight wildland fires more effectively.
 - Received training in confined spaces and bloodborne pathogens. The Fire Services Group emergency services personnel were the first LBL employees to receive the new bloodborne-pathogen training, mandated by a new OSHA regulation.
-

Continued on next page.

Fire Services Group (continued)

Fire Prevention Unit

The Fire Prevention Unit is managed by the Assistant Fire Chief of Fire Prevention under authority of the Fire Chief. The Fire Prevention Unit has a major role in establishing and implementing the LBL Fire Protection Program, as required by DOE Order 5480.7. This role includes a continuing LBL-wide responsibility in providing technical and engineering support, evaluation, and oversight to operating groups and technical disciplines in protecting LBL employees and visitors from fires and related perils. The mission is carried out through preventative efforts by eliminating the obvious potential causes of fires and life-safety hazards, recommending engineering controls, regulating the amounts and use of hazardous materials, and improving fire safety awareness by those who occupy LBL buildings.

A new Fire Protection Engineer was hired in June 1992. Because of this hire, critical elements of the LBL Fire Protection Program are now being accomplished. Elements such as developing incident trend analyses and loss-potential surveys have been initiated.

- The incident trend analysis will provide vital statistical information in identifying root causes of incidents occurring at LBL.
- The loss-potential surveys will identify additional fire protection features required for vital programs at LBL.

Continued on next page.

Fire Services Group (continued)

Fire Prevention Unit Accom- plishments

- Developed a comprehensive Company Fire Protection Manual to provide the necessary instructions and documentation in implementing an LBL-wide fire-safety inspection program.
- Upgraded the Laboratory's fire extinguishers. Outdated single-purpose pressurized-water extinguishers were eliminated, and dual-purpose CO₂ extinguishers were relocated in approved locations while complying with the maximum-travel-distance requirements. As a result, LBL's fire extinguisher inventory was reduced by about two thirds, with consequent maintenance cost savings.
- Received funding for a LBL-wide fire and safety upgrade project. This funding will provide the necessary fire-safety upgrades for the deficiencies identified in a sitewide survey conducted by an outside fire-protection consultant.
- Completed the first two phases of the Laboratory's Vegetation Management Program, including removal of a 30,000 gallon liquefied petroleum gas tank (a potential explosion hazard) and replacing fire-prone brush with fire-resistant native plants.

Continued on next page.

Fire Services Group (continued)

Relations with Other Local Fire Agencies

LBL has been formally recognized as an active participant in the Hills Emergency Forum, the East Bay Hills Vegetation Management Consortium, and the East Bay Fire Chief's Consortium. These organizations were established as a direct result of the disastrous Oakland Hills fire of October 1991. The Fire Prevention Unit plays an active role in all of these organizations. The mission of all these organizations is to provide a comprehensive multi-agency fire protection program for the East Bay hills wildland/urban interface (where LBL is located, incidentally). The elements of the mission include

- developing a Vegetation Management Plan
 - coordinating fire services resources, information, and protocols between fire agencies
 - committing all participating agencies to continue to promote the fire protection program
-

Staff (as of 6/93)

Fire Services Group Leader: B. White

Administrative Support: J. Crafton, M. Jara

Operations Unit

G. Dietrich (Manager)	W. Nordby
M. Berejkoff	B. Olson
H. Blair	C. Palmer
D. Bugnatto	D. Piepho
G. Dunbar	K. Ronchetto
M. Fitzgerald	M. Stoner
D. Horn	S. Sugar
L. Lockhart	B. Tweedell
K. McKenzie	R. Valentine
M. Noon	

Fire Prevention Unit

C. Hernandez (Manager)
D. Dewey
T. Yuen

5. Other Groups and Units

Overview

In addition to the three major Departments, EH&S also includes several smaller units. They are:

- Division Administration
- Quality Assurance
- EH&S Training
- Hazard Management

Details of each of these unit's activities are provided on the following pages.

Division Administration

Overview

The mission of the Environment, Health and Safety Division is to provide professional and technical expertise, to support and enhance the Laboratory's research and development programs, to ensure employee and public safety, and to protect the environment. The Administrative Support Group assists the Division Directorate, Department Heads, Group Leaders, and technical staff in completing these tasks.

Organization

In order to carry out its mission, the Division Administration is organized to cover the following areas:

- Budget Support for Programmatic and Overhead Calls
 - Central Administrative Support
 - Accounts Payable, Purchasing, Travel, and Training
 - Records Management and Computer Network Administration
 - Administrative Policies and Procedures
-

Accomplishments for 1992

This Group has made significant contributions to the Division, as described below.

- Set up systems to track waste shipments.
 - Participated in the preparation of the Institutional Plan.
 - Coordinated the EH&S Safety Awards.
 - Assisted with the Part B Permit Submission.
 - Assisted in preparing materials for various EH&S training Courses
 - Assisted with the submission of the Environment, Safety and Health Five Year Plan.
 - Assisted with the submission of the ERWM Five Year Plan.
 - Organized the Eldercare and Summer Childcare Fair.
 - Coordinated the budget for Overhead and ERWM.
 - Coordinated travel and training for all EH&S staff.
 - Coordinated EH&S property management.
 - Coordinated EH&S personnel.
-

Continued on next page.

Division Administration (continued)

Accomplishments for 1992 (continued)

- Promoted minorities and women from within EH&S.
 - Wrote personnel procedures.
 - Developed a personnel database.
-

Staff (as of 10/93) Division Administrator: A. Moré
Department Administrators:
 Environment: M. Carnahan
 Health: K. Richards
 Safety: D. Clark
Personnel Administrator: S. Kronquist
Division Office: F. Gee, C. Mittan
Business Services: C. Eaton, J. Johnston
Network Administration: R. Morelli
Records Management: J. Stoner
Travel Coordination: J. Noble
Fire Services: J. Crafton
Emergency Preparedness: M. Turner
Health Services: N. Dietrich, W. Charles, J. Creson
Employee Assistance: D. Attia
Human and Animal Use Committee: C. Byrne
Industrial Hygiene: to be hired
Occupational Safety: J. DeMaria
Environmental Protection: S. Wyrick
Environmental Restoration: T. Gock-Yuan
Waste Management: J. Smith, P. Branaman, J. Walker,
J. Brushwood, A. Ersery

Quality Assurance

Overview

The EH&S QA Manager was hired in September 1992. Consequently, the EH&S QA program did not really get started until 1993. A more complete report on the EH&S QA program will appear in next year's EH&S Annual Report. However, some tasks were accomplished in 1992. These are listed below.

Accomplishments for 1992

- Produced the EH&S-wide document review and approval procedure (EH&S Division Procedure 4.01, *Review and Approval of Documents*). This document was issued in December 1992.
 - Produced the EH&S-wide document control procedure (EH&S Division Procedure 4.02, *Document Control*). This document was issued in January 1993.
 - The Fire Services Group developed pilot Function and Facility Notebooks as part of the initiation of the sitewide QA program.
-

Interaction with Others

By its nature, the EH&S QA program interacts only with other EH&S groups, aiding them in meeting their QA and Conduct of Operations requirements.

Staff (as of 6/93)

EH&S QA Manager: T. Davis

EH&S Training

Overview

The EH&S Training Unit assures that all LBL personnel receive training necessary to prevent or mitigate occupational exposure to hazardous materials or operations, and to protect the environment in order to assure safe and responsible research and support activities. This mission is carried out as follows:

- Identification of required and recommended training based on Federal, state, and local regulations, as well as emerging occupational health problems and issues.
 - Development and implementation of training programs.
 - Technical assistance to divisions on EH&S training needs and programs.
 - Development and maintenance of proper documentation and record-keeping systems.
-

Unit Functions

To accomplish its Mission, the Unit performs the following functions:

Program Planning: Assesses environmental and occupational health and safety training needs based on analysis of DOE Orders, OSHA regulations, environmental laws, and accident/incident trends to ensure timely and continuing compliance.

Program Implementation: Designs and presents EH&S training courses; and develops educational materials such as guidebooks, handbooks, and videos to communicate hazards, risks, controls, and safe work practices. Prepares lesson plans and executes evaluation methods. Issues include, but are not limited to, hazard communication/chemical safety, radiation safety, hazardous waste, material handling, ergonomics, and supervisor ES&H training.

Technical Assistance/Service: Provides resources, assistance, and oversight to other EH&S professionals in training program development in the areas of occupational safety, radiation safety, emergency response, and industrial hygiene. Consults with divisions to assess and implement training programs that meet specific needs.

Documentation Systems: Establishes and maintains data bases and other record-keeping systems to track all EH&S training given to LBL personnel and to assess compliance.

Continued on next page.

EH&S Training (continued)

- Accomplishments for 1992**
- Produced two training videos (*Radiation Dosimetry* and *Environmental Compliance: Hazardous Waste and Radioactive/Mixed Waste*), one new handbook (*Health & Safety Handbook for Subcontractors and Visitors*), two brochures (*Health & Safety for Visitors and Guests* and *Using VDTs Safely*), and one revised handbook (*Health & Safety Handbook*).
 - Implemented a new *Chemical Hygiene and Safety* training course, and revised two courses (*Hazardous Waste/Radioactive Waste* and *Forklift Safety*).
 - Implemented a new Labwide training data base on FOCUS with division input. Enhancements include numerous training reports. This work is ongoing.
 - Greatly expanded LBL's Ergonomics Program. This included creating a VDT ergonomic display area for LBL staff in order to demonstrate ergonomic equipment and accessories for computer users, informing top management about the extent of the ergonomics problem and the accompanying solutions, and presenting our program to the DOE community at the annual Training Resources and Data Exchange (TRADE) Conference.
 - Provided greater customer communication through assignment of training staff to each division safety committee, improved class registration procedures, monthly publicity, timely announcements in *Currents*, and focus groups and other needs-assessment tools for course development.

Continued on next page.

EH&S Training (continued)



EH&S Training Unit Manager Mona Bernstein leads a Hazard Communication course for LBL employees, one of dozens of courses and workshops led by the EH&S Training Unit.

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Interaction with Others

The Training Unit staff work with other EH&S staff routinely to develop, administer, and document courses in Occupational Safety, Radiation Safety, Industrial Hygiene, Waste Management, and Emergency Preparedness.

In addition, members of the training staff attend division safety meetings, providing two-way communication between EH&S training programs and division concerns. The publications and videos have been produced with division input and are used Labwide, and the new employee handbooks are given to each arriving employee or guest.

Staff (as of 6/93)

Training Specialists

Training Unit Manager: M. Bernstein

N. Humphrey
S. Rigler-Udo

Administrative Support

F. Ingram

Hazard Management Unit

Overview

The Hazard Management Unit was created in January 1993. Its mission is to facilitate and oversee institutional safety review systems at LBL

- to minimize the risks associated with exposure to and release of hazardous agents from LBL activities and operations, and
- to ensure compliance with various Federal, state, and local regulatory requirements and Department of Energy directives.

This mission is carried out in three ways, all LBL-wide:

- Coordination across LBL,
- Assessment of the LBL facility, and
- External reporting for LBL.

These three elements are explained in detail below.

- **Coordination across LBL**
 - to increase effectiveness and efficiency of the EH&S safety analysis and review processes,
 - to provide pertinent hazard and hazardous-materials information to appropriate EH&S units in order to assist them in fulfilling their individual programmatic objectives,
 - to establish a dialogue among pertinent parties within EH&S in order to address safety-related issues of an overriding nature, and
 - to facilitate hazard reporting by the DOE Site Office.
- **Assessment of the LBL facility to determine**
 - if existing programs contain adequate and sufficient hazard documentation and review systems, and
 - if new activities and proposed research projects address applicable operational and safety-system considerations (through the safety analysis and review process).

Continued on next page.

Hazard Management Unit (continued)

Overview (continued)

- **External reporting for the LBL facility**
 - to satisfy requirements for reporting of sitewide hazard information to Federal, state, and local entities, and
 - to make hazard information available to the surrounding community and other interested parties.
-

Functions

In support of its mission, the Hazard Management Unit performs the following functions:

- *Program Planning:* The Unit assesses the status and compliance level of various programs at LBL by analyzing pertinent DOE Orders, OSHA regulations, hazardous-materials reporting statues, and noted areas of deficiency. Program activities may need to be modified to ensure continued compliance.
 - *Safety Analysis and Review:* The Unit provides overall review coordination for Activity Hazard Documents, research proposals, hazardous-materials inventory statements, and other safety documentation needed to satisfy DOE Orders and pertinent regulatory requirements, and to mitigate identified deficiencies. The unit is also responsible for developing and implementing all LBL Safety Analysis Review System requirements. It interfaces with divisions and other EH&S professionals to ensure that applicable reviews are completed on time.
-

Continued on next page.

Hazard Management Unit (continued)

**Functions
(continued)**

- *Hazard Reporting:* The Unit provides timely and comprehensive submittals of hazard information to DOE and other appropriate regulatory agencies. These documents include
 - the sitewide Business Plan,
 - the Toxic Release Inventory, and
 - the Risk Management and Prevention Program.
- *Safety Documentation:* The Unit manages electronic hazard tracking database systems and other record-keeping tracking systems to assure compliance with DOE Orders and pertinent regulatory requirements.
- *Administration/Management:* The Unit manages its program scope, resources, budget, work plans, and time lines to carry out its mission.

Staff (as of 6/93)

Unit Manager: D. Tudor

M. Karner

J. Salazar

Acknowledgements

Many people made this publication possible. In alphabetical order, they are Steve Adams,[†] David Balgobin, Jack Bartley, Don Bell, Mona Bernstein, Mary Bodvarsson,^{††} Nancy Bradfield-Montoya, Tammy Campbell,[†] Rich Celestre, Delia Clark, Thom Davis, Jypsy De Maria, Nancy Dietrich, Don Fike,[†] Jim Floyd, Forrest Gee, Tom Glimme, Howard Hansen, Holden Herbert, Susan Jahansooz, Iraj Javandel, Billy Johnson, Paul Johnson, Roger Kloeppeing, Matt Kotowski, Ann Kumaranayagam, Mark Lasartemay, David McGraw, Chenoa Mittan, Gale Moline, Vic Montoya, Anil Moré, Michelle OBrien, Ron Pauer, John Rosen, Henry Stauffer, Jackie Thomas, Pat Thorson, Jane Toby, Kam Tung, Tim Wan, and Billy White. For those of you who I have left out, my apologies in advance.

The document was produced by Rich Albert.[†]

[†]Technical Information Department

^{††}Public Information Department

Production Information

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UNIVERSITY OF CALIFORNIA
TECHNICAL INFORMATION DEPARTMENT
BERKELEY, CALIFORNIA 94720