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Facilities Division ISM

Integrated Safety Management

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Facilities Division ISM Plan 2012

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Record of Revisions

Rev.No.	Date	Description
1	8/28/2009	Revised 5.3 Work Requiring Specific Authorization Revised 6.2 Safety walkaround Revised 10.2 Add Appendix A Control Documents
2	10/07/10	Major Revision
3	03/30/12	Major Revision
4	08/13/13	Updated for Construction Safety Revisions
5	11/13/13	Updated for Construction Safety Revisions
6	01/13/14	Revised inspection requirements
7	02/06/15	Revised inspection requirements (7.2)



1.0 Purpose

The Division Integrated Safety Management Implementation Plan is the guiding document implementing the Facilities Division's integrated EH&S program. This plan describes the business practices and mechanisms used in the division to ensure that LBNL EH&S policies and requirements are properly implemented. It provides a systematic inventory and analysis of ES&H hazards found in the Division and describes the implementation of control for these hazards. The Laboratory's ES&H policies and requirements are contained in the:

- Regulations and Procedures Manual (RPM) §7.01 [Environment, Safety, and Health \(ES&H\)](http://www.lbl.gov/Workplace/RPM/R7.00_TOC.html), (http://www.lbl.gov/Workplace/RPM/R7.00_TOC.html)
- Health and Safety Manual (LBNL/PUB 3000), <http://www.lbl.gov/ehs/pub3000/>
- Operating & Quality Management Plan, Rev. 9 LBNL/PUB-3111 (http://www.lbl.gov/DIR/OIA/assets/docs/OCA/IA/PUB_3111%20rev%209.pdf)
- Work Smart Standards (WSS) set <http://labs.ucop.edu/internet/wss/wss.html>

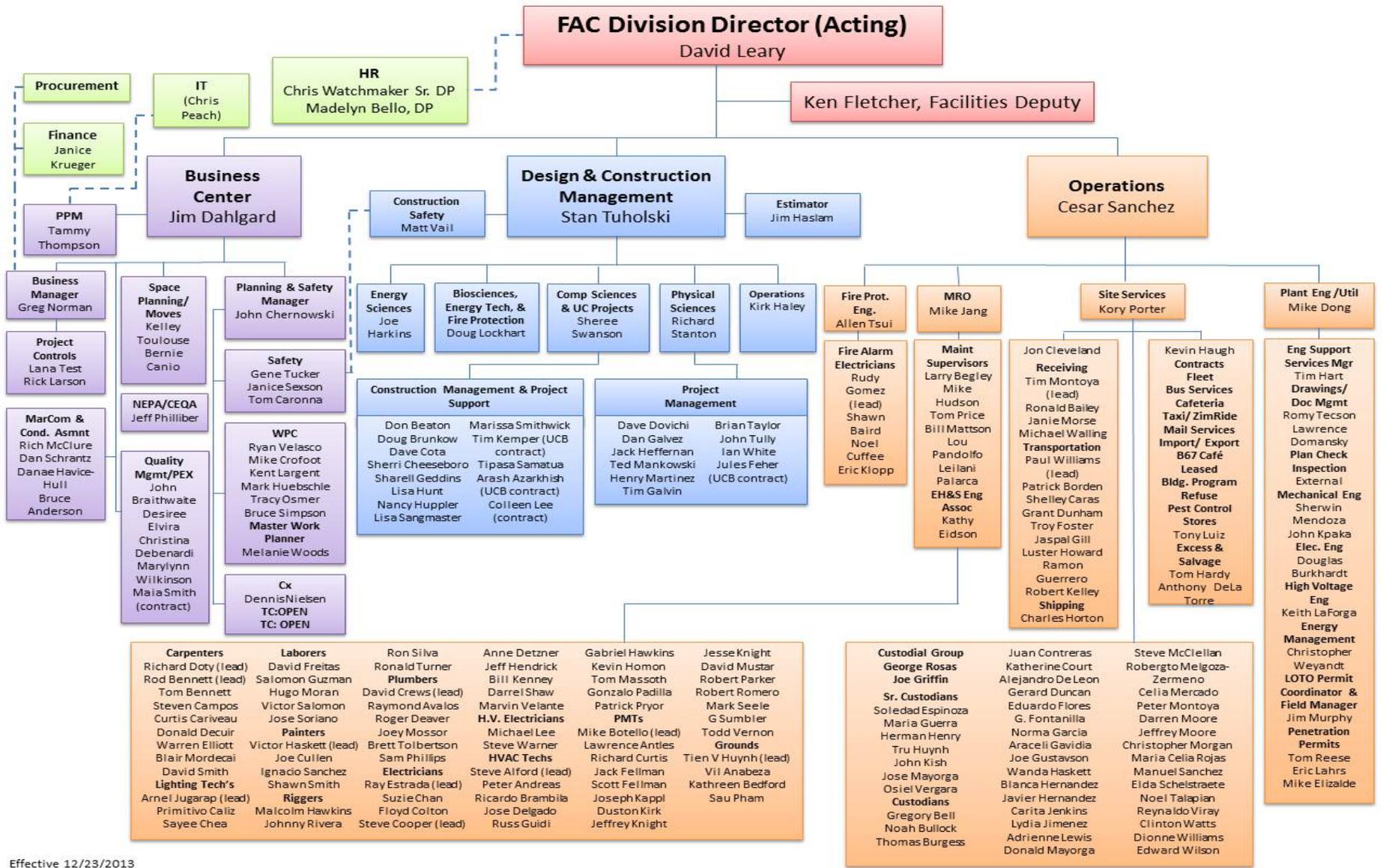
This document describes which EH&S requirements are applicable, and the mechanisms that will be maintained by this Division to ensure that they are properly implemented.

2.0 Division Organization, Mission, and Scope of Work

The Facilities Division enables world class science through the maintenance and construction of lab infrastructure, logistical support and energy management in a manner that upholds the highest level of integrity by ensuring the safety of its workers, listening to the voice of the customer, and delivering exceptional services through teamwork and efficient operations.

Work in the Facilities Division includes all planning, construction, maintenance, and repair activities for the physical plant at the Laboratory. In addition, general logistical services are provided. These include shipping, warehousing, material transportation, passenger transportation, fleet operations, mail services, stores, inventory management and managing the site cafeteria operation.

Our goal is to sustain safety processes and develop a culture that does not allow for injuries. Injuries are NOT part of the job and the daily performance of hazardous tasks does not justify a position of acceptance for at-risk behavior. Supervisors and managers must lead the safety effort in part by modeling safe behavior and enabling their staff to work safely. Training and observation routines must not be compromised and at-risk behavior, as well as any processes that enable at-risk behavior or hazardous conditions must be corrected. **Zero Injuries are achievable and expected!**



Effective 12/23/2013

Facilities Organizational Chart

3.0 Roles, Responsibilities and Accountability

All employees are directly responsible for the safe conduct of work and to follow the ISM Plan by taking the following non-inclusive actions:

1. **Define the scope and task sequence required for the job.** Re-evaluate and reauthorize work if the scope or job related hazards change.
2. **Analyze the hazards by performing continuous hazard/risk assessment of the task and scope.** All work requires some form of hazard, risk, or impact analysis.
 - a. Pre-job and routine safety walkarounds and tail gate meetings are one way for every employee to know and communicate what hazards, risks, and impacts are identified prior to starting the job.
 - b. Situations change constantly-therefore constant hazard risk and impact analysis is another way to identify and control risk.
 - c. Keep Job Hazard Analysis current.
3. **Control the Hazards:**
 - a. Every hazard and risk identified must have an action taken to eliminate or control the risk. This can include the use of Personal Protective Equipment, guards, procedures, and use of a task hazard analysis.
 - b. Actions include keeping required training, certifications, and authorizations current.
 - c. A self-check of personal physical and mental readiness to perform the work can also be used to control the hazard.
4. **Perform the work:**
 - a. Doing the work as planned and within controls.
 - b. Continually monitor changes that may introduce an additional hazard or risk.
 - c. Stop work any time circumstances change.
5. **Feedback**
 - a. Identify and discuss procedures, practices, tools, or equipment that can be adjusted or improved.
 - b. Update and communicate practices, procedures, controls

The Division Director, group leaders, other formal supervisors, and individual workers are expected to define work, identify hazards and adverse environmental impacts, implement controls, perform work safely, provide feedback and continuous improvement as appropriate.

3.1 Division Leadership Responsibilities

The Division Director is responsible and accountable for assuring that all Facilities activities are carried out in a safe manner in accordance with all Laboratory requirements. The Division Deputy assists the Division Director and acts on behalf of the Director's behalf when the Director is unavailable. The Division Director and

Deputy perform safety walkarounds according to the guidance and criteria provided in Pub 3000.

The Division Director is responsible for the timely reporting of adverse and /or abnormal occurrences that occur at Facilities Division or operations. The Division Director has overall responsibility for ensuring occurrence reporting procedures are properly implemented and corrective actions are instituted to prevent incident recurrence. The Division Director must concur with the decision that a given incident is a reportable occurrence through the Department of Energy (DOE) Occurrence Reporting and Processing System (ORPS).

3.2 Supervisor / Management Responsibilities (e.g. group leaders and formal supervisors, as appropriate).

All Facilities supervisory and management personnel have a responsibility to follow the seven guiding principles and five core functions derived from DOE Order 450.4. They are responsible to ensure that employees receive ES&H training that is appropriate to the tasks being performed, and that work follows all applicable ES&H regulations, authorizations and requirements.

Supervisors are responsible for creating a safe workplace. They are to model safe behavior and provide leadership in safety by taking the following non-inclusive steps:

- Assure EH&S requirements are integrated into work activities and the necessary resources/controls are provided in a timely manner, perform work safely and in accordance with all Berkeley Lab EH&S requirements.
 - Become familiar with PUB 3000 and other relevant EH&S policies and safe work practices
 - Take preventive actions to minimize injuries and illnesses, property damage and adverse environmental impact
 - Approve Supervisor's Accident Analysis Report (SAAR) within 24 hours of receipt by the EH&S assigned investigator.
 - Document any deviation from policies and procedures that could result in accidents and/or injuries to the employees or others as well as environmental incidents.
 - Encouraging their employees to participate in the Division's various Safety Committees.
 - Ensure that engineering controls are certified/checked, calibrated, and/or serviced prior to use within the required schedule.
 - Performance evaluations (P2R/PRD) of division managers and employees will include review of safety performance.

- Terminate or suspend operations when approvals or permits are lacking, authorizations have expired, or training is not current.
 - Determine and communicate PPE requirements.
 - When safety issues cannot be resolved by the line manager or the immediate supervisor (beyond the scope and capability), elevate the issue to the appropriate next level of management.
- Create meaningful and realistic safety expectations for staff and hold staff accountable in annual performance appraisals. The expectation is zero injuries.
 - Identify the ES&H training requirements for their employees, guests, contractors, visitors, students, and matrixed employees and ensure such training is completed and documented. Review Job Hazard Analysis Process with staff annually (or when duties change significantly).
 - Conduct safety walkarounds to interact with staff in their workspaces, recognize safe work practices and conditions, and identify and correct unsafe work practices and conditions. The interaction can include observation, discussion and inspection. See Section 6.2.
 - As part of the employee performance appraisal process, meet at least twice annually with each employee supervised. Supervisors and staff should use these interactions to identify safety hazards and environmental impacts and corresponding prevention or mitigation measures.
 - Ensure that new or significantly modified projects and facilities are reviewed for potential hazards and environmental impacts in the planning stage.
 - Annually review and update as appropriate) the Division's Hazards and Equipment, listed in the Hazards Management System (HMS).
 - Group Leaders are responsible for the annual review of authorizations within their jurisdiction.
 - Track safety deficiencies in the Laboratory's Corrective Action Tracking System (CATS) as assigned. Ensure and document that findings are reviewed, approved and closed in a timely manner.
 - Group leaders (and supervisors as appropriate) conduct periodic safety meetings twice each month.
 - Group leaders designate a group representative to the Division Zero Accident Council. Each group must have a representative present at the monthly Safety Committee meetings who will report back training information to their group. This will satisfy one half of the monthly training requirement.
 - Group leaders (and supervisors as appropriate) ensure that work loads are managed and distributed appropriately to avoid ergonomic injuries. Staff should be encouraged to take frequent breaks and mix work responsibilities, optimize the use of tools, equipment and software to reduce the risk of ergonomic injuries. Ergonomic issues should be included in safety walkarounds and in staff meetings.

3.3 Work Leads

A Work Lead is anyone who is authorized by their line management to direct, train, and/or oversees the work and activities of one or more laboratory craft workers. Work Leads provide instruction on working safely and the precautions necessary to use equipment and facilities, safely and effectively. As part of the work planning process, Workers and Work Leads are required to plan all work: determine the tasks that will be performed, consider the hazards, risks, and concerns associated with those tasks, and implement appropriate controls. Work Leads must assure that LBNL employees know how to perform the work safely and in conformance with applicable requirements, and must provide on-the job training as needed. Work Leads need not be Line Managers, HEERA-designated Supervisors, or LBNL Employees. All Work Leads are Safety Line Managers.

3.4 Staff/Worker Responsibilities

Employees, participating guests, contract labor, contractors, students and visitors are responsible for knowing and following the ES&H requirements that apply to their work. They are expected to work safely, determine which ES&H requirements apply to their work, and to cooperate with the division ES&H activities.

Individuals performing work within the Facilities Division are responsible and accountable for ensuring that all activities are carried out in a safe manner, and in accordance with all Berkeley Lab ES&H and regulatory or contractual requirements. This responsibility and accountability cannot be delegated.

3.5 Subcontracted Work and Staff

An authorizing individual (AI) and responsible individual (RI) will be assigned for any maintenance, repair or construction work to be performed by a subcontractor.

- **AUTHORIZING INDIVIDUAL FOR SUBCONTRACT WORK:** The Authorizing Individual (AI) is designated by the Facilities Division and responsible for a work activity's technical, financial, and EHSS objectives.
- **RESPONSIBLE INDIVIDUAL FOR SUBCONTRACT WORK:** The Responsible Individual is designated by the Facilities Division and responsible for work directly performed by the subcontractor.

All contracted work under division/department auspices must be accomplished in a safe manner by defining the scope of the work, identifying hazards and by applying the principals of the Integrated Safety Management model (ISM). The Subcontractor Job Hazard Analysis (SJHA) process, described in PUB-3000, Chapter 31, will be used to assure safe subcontractor performance. If there is any question about the safety or environmental impact of an activity, the work should be stopped and the issue(s) resolved before proceeding. The specific policy and procedure for stopping work is found in LBNL/PUB-3000, Chapter 1, Section 1.5 (Stopping Unsafe Work) at: http://www.lbl.gov/ehs/pub3000/CH01.html#_Toc407015329

3.6 Matrixed Employees

Matrixed employees' supervisors from the home divisions or departments retain all environmental, health and safety responsibilities pertaining to matrixed employees, except where some of the responsibilities have been transferred to the host division or department through a formal Memorandum of Understanding (MOU). When applicable, home and host supervisors are to identify their responsibilities for employee safety in the MOU.

3.7 Student and Summer Intern Safety

Education and training of future generation of scientists and engineers is one of the University's missions and Berkeley Lab has a special responsibility to teach students to do their research safely. Part of teaching them to work safely is to ensure they are provided a safe and healthful work place. This obligation for providing a safe and healthful working and learning environment extends to students, guests, and visiting scholars, compensated or not.

ISM does not distinguish between students and other personnel working at LBNL. Students are afforded the same protections and assume the same obligations as any LBNL employee or guest for safe work practices.

Before work begins, supervisors are responsible for assuring that each student possesses a thorough understanding of safe work practices. Supervisors are responsible for assuring that each student or summer intern completes a Job Hazard Questionnaire (JHQ)/Job Hazard Analysis (JHA), EHS010 (New Employee Orientation), and performs work in accordance with [RPM 7.01.C \(Planning a Safe Work Environment\)](#). Supervisors and mentors of students participating in the Center for Science and Engineering Education (CSEE) program will execute an MOU with CSEE that clarifies the responsibilities of supervisors, mentors, students, and CSEE personnel.

The Facilities Division currently has no working students under this program.

3.8 Division Safety Coordinator and Division Safety Manager

The Safety Coordinator and the Division Safety Manager Support division line managers or work leads in the execution of their safety responsibilities. The Safety Coordinator helps integrate safety into all work activities. The Manager oversees the Division ES&H program, including serving as point of contact for all division staff regarding the implementation and interpretation of EH&S policies, procedures, and programs:

- Upon request, provide Performance Review and Development (PRD) input to the Division Director on the safety performance of division staff
- Consult and coordinate with the EH&S Division and other resources as needed
- Be familiar with division staff, facilities, work activities, and potential hazards

- Serve as the division point of contact for the LBNL Work Smart Standards Program
- Serve as a member of the Division Safety Coordinators committee, and attend this and other meetings as necessary
- Coordinate and manages required safety documentation including:
 - Division ISM Plan (principal author)
 - Training and JHA records
 - SAAR (approval authority)
 - CATS (approval authority)
 - Walkaround inspection reports
 - Work authorizations
 - Occurrence Reporting and 10CFR851 reporting
 - Ergonomic reviews and records
 - Accident Review board
 - Root Cause Analysis
- As an assurance mechanism that supports line managers or work leads, assess the adequacy of hazard controls through frequent inspections and monitoring of work activities, as defined by the ISM plan. Facilitates the implementation of appropriate hazard controls.
- Serve as a conduit for feedback on how safety is implemented
- Manage the annual division self-assessment, including: participating in the development of objectives, training and leading assessment teams, writing and coordinating the approval of the annual assessment report, and ensuring that findings are entered into CATS.
- Serve as the division point for contact for EH&S audits originating external to the division, including Integrated Functional Appraisals, MESH reviews etc.
- Support the investigation of incidents, including injuries, accidents, and other safety and environmental incidents

3.9. Safety Advisory Committee Member

The Safety Advisory Committee (SAC) performs research for and makes recommendations to the Laboratory Director on the development and implementation of Environment, Safety, & Health (ES&H) policy, guidelines, codes, and regulatory interpretation. It conducts reviews of special safety problems and provides recommendations for possible solutions to the Laboratory Director and/or the ES&H Division. The SAC also provides advice and counsel to the Associate Laboratory Director for Operations by reviewing appeals from the Laboratory Divisions when any Division and the EH&S Division do not agree on the interpretation or application of criteria, rules or procedures. Such advice and counsel may include options for a resolution.

SAC members are expected to:

- Possess an understanding of the 5 Core Functions and 7 Guiding Principles of Integrated Safety Management.
- Communicate regularly with senior Division management and other Division personnel as needed.

- Possess communications skills to comment, suggest, recommend, revise, advise, and influence the Laboratory's approaches, methods, documents, and practices to continuously improve the Laboratory's safety programs.
- Develop an understanding of PUB 3000 and related documents, and the processes for revising these documents.
- The Facilities Safety Manager will participate on this committee.

3.10 Building Manager Responsibilities

The Building Managers are authorized by the Division Director to ensure that the required building management functions are staffed properly by one or more qualified individuals, and the building duties are carried out effectively.

Building management functions include but are not limited to:

1. Emergency preparedness;
2. Coordination of construction and maintenance activities;
3. Serving as a point of contact for general information about the building activities and occupants.

3.11 Work at UC Berkeley Campus

Work carried out on the UC Berkeley campus in spaces under the control of UC Berkeley will be carried out in accordance with the "PARTNERSHIP AGREEMENT BETWEEN UCB AND LBNL CONCERNING ENVIRONMENT, HEALTH AND SAFETY POLICY AND PROCEDURES", dated 3/15/2004, as amended. This document delineates responsibility and oversight of safety requirements for work carried out in LBNL and campus spaces. It establishes a clear expectation that Berkeley Lab managers are expected to take the initiative in following locally applicable ES&H rules, and specifies that work carried out at LBNL, including Donner Laboratory, is carried out in accordance with LBNL rules, and that work carried out at UCB is governed by UCB rules. The Partnership Agreement is an appendix in the institutional ISM Plan (Pub 3140). It can be viewed at the following URL: http://www.lbl.gov/ehs/ism/ucb_lbl_partnership_3_15_04.pdf

3.12 Offsite Work

The safety of Division personnel assigned to work off site at non-DOE facilities (e.g., abroad, in private industry, at educational institutions or remote field locations, etc.) will be addressed, as appropriate through the host's ES&H protection programs by the responsible line-management chain of the host organization. It is the responsibility of the employee's Laboratory line manager/supervisor to review the scope of work, associated hazards, and necessary controls with the Laboratory employee prior to offsite work. Work involving use of ionizing radiation, non-ionizing radiation, chemicals, biological agents, or exposure to physical hazards (pressure, electrical, mechanical, environmental (noise/heat/cold/vibration), industrial equipment, ergonomics, etc.) will require ISM review.

3.13 Telecommuting

Per LBNL policy, [RPM 2.23\(D\)\(5\)](#), telecommuting is a viable work option under certain conditions. Once a telecommuting agreement is officially approved, the employee's offsite work space must be maintained by the employee. EH&S facilitates telecommuting and remote location work by offering support services for LBNL employees using computers off site. Employees using a computer either at a remote location or telecommuting should take Web-based Remedy Interactive self-evaluation & training (EHS0059).

4.0 Division Safety Committee

The Division Executive Safety Committee is chaired by the Safety Manager, and consists of the Division Director, Division Directors direct reports, and the Division Safety Coordinator. This committee sets safety policy for the Division. This committee meets monthly.

The function of the Executive Safety Committee is to provide safety leadership and communication to the Facilities Division, with the primary objective of maintaining a healthy, motivated workforce.

The DZAC (Division Zero Accident Council) consists of representatives from within each working group in the Division. Members bring safety concerns and suggestions from their group's workers for discussion with a member of senior management. They are also responsible for communicating the results / disposition of safety concerns back to their group. Safety training is also provided for members to present to their work groups. Attendance at the work group's training must be properly documented. DZAC representatives:

- Attend monthly for one or more year term
- Work with supervisor to send a replacement if unavailable to attend. All representatives or alternates must attend each meeting.
- Represent their work group carrying forward issues and concerns to DZAC
- Communicate DZAC activities etc back to their employee groups

5.0 Work Authorization: Facilities Personnel

The Facilities Work Planning and Control process (WP&C) is designed to help ensure worker safety through better planning and scheduling of work orders. This process adds to the safety management system and fully encompasses the principles of Integrated Safety Management (ISM). It provides clear and sensible policies, a graded approach to safety, and user-friendly tools. The WP&C system will increase overall efficiency in the work-authorization process, enhance safety analysis and communication, and improve interactions among staff and safety personnel. WP&C will:

- Combine all current authorizations into a single process based on activities
- Reduce the overall workload by eliminating the need for individual JHAs
- Determine a comprehensive scope of work

- Identify a responsible party, the Activity Lead, for each work activity
- Directly involve an Activity Lead in the application of ISM to their work
- Provide a tool for the identification and evaluation of hazards associated with work (Integrated Hazards Analysis). This tool provides accessible, reliable and maintainable hazard and control data that will be used to:
 - Provide the Work Planning and Control Project's Activity Subsystem with the data required to enable automated application of standardized controls through a system-based, interactive hazard identification process using, in part, its "Library" of hazards and controls
 - Enable consistent and easy reference to policy and procedure source content relating to specific hazards and controls
 - Demonstrate traceability between safety requirements, identified hazards and standardized controls
 - Support a controlled, repeatable process that maintains the data's accuracy and relevance as contractual requirements, Lab policies and best practices evolve
- Identify on-the-job training required for each activity
- Facilitate communication of activity related hazards and controls to staff
- Allow for the identification of co-located hazards at a specific location

The WP&C process will supersede and modify the following sections of this chapter as it becomes more integrated with the Facilities Work Order practices.

5.1 Work Locations, Facilities and Work Location Hazards

The Facilities Division works site wide with responsibilities that include design, engineering, project management, and construction management. In addition, functions include custodial, gardening, maintenance, fleet, mail distribution, utility systems and cafeteria operations.

The inventory of location and equipment hazards is maintained in the Hazard Management System (HMS) database. The Hazard Management System links with the MAXIMO work order tracking database allowing Facilities to classify assets and hazards in an organized structure. The hazard level prints out on the MAXIMO work order form.

5.2 Work Requiring Specific Authorization

Each supervisor will prepare ES&H documentation and obtain required approvals for potentially hazardous or regulated work as specified in Chapter 6 of LBNL/PUB-3000 prior to commencement of the work. The following work presently carried out in this division requires such documentation:

- All work requires an individual Job Hazard Analysis (JHA).
- Higher hazard work at Berkeley Lab is subject to formal work authorizations as described in the LBNL Health and Safety Manual (Pub 3000), Chapter 6. Examples of such documentation include:
- Radioactive Work Authorizations (RWAs), Sealed Source Radioactive Materials Authorization (SSAs), Activity Hazard Documents (AHDs), and Biological Use Authorizations (BUAs), etc. Work within Facilities

that requires formal authorizations (i.e., a permit) include entering a confined space, drilling into concrete or drywall (penetration permit), General Stormwater Construction permits, Radiological Work Permits, and High Consequence Lifts.

- The Facilities Division currently has two active Electrical AHD's at the beginning of the fiscal year.

5.3 MAXIMO

Facilities Division has applied a graded approach to its work control process, ensuring that the greater the hazards associated with its activities, the more rigorous the work planning required. Work Leads analyze the hazards associated with Facilities work and communicate the required controls to the workers. Their responsibilities include:

- Analyze hazards associated with work.
- In consultation with EH&S, Facilities Safety, as necessary, develop and document controls for the hazards present (i.e. formal work authorizations and/or Task-Based Job Hazards Analyses).
- Ensure formal work authorizations are in place prior to starting work, as applicable.
- Revisit hazard analyses when work conditions change. Revise hazard analyses, as necessary.
- Review hazard analyses with worker, as appropriate.
- Ensure workers review and sign applicable hazards analysis documentation.

5.4 Workers

- Perform work in accordance with work instructions and established ES&H controls.
- Stop Work and notify Work Lead if work instructions cannot be followed safely as presented, the scope of work changes, or controls are believed to be inadequate.
- Do not begin work until the hazards analysis accurately describes the work and has been re-authorized. Provide feedback on work instructions and controls

Task-based JHA - Work that is unpredictable, short-term, or unusual and is not included in the Individual Baseline JHA must be analyzed in a Task-based JHA.

5.5 Students and Summer Interns

It is the line manager's/supervisors responsibility to ensure students and summer interns are added to a formal authorization and receive the specified training before they begin work under it. They, like employees, participating guests and contractors, must follow the authorization's requirements.

For students and interns who are involved for short periods of time, it is permissible to work under a formal work authorization so long as they are directly supervised by a trained lab employee listed on the authorization.

5.5.1 Line Management Work Authorization

Lower hazards are also described in PUB 3000 Chapter 6 which allows line management to authorize work without a formal work authorization. Line managers or supervisors are required to assess the hazards of such work and prescribe the appropriate controls (engineering and administrative) to address the hazards and to ensure students have appropriate training before doing work.

Use of the LBNL Job Hazards Questionnaire (JHQ) will assist in identifying the safety training necessary to prepare the students to work safely. To utilize this online system, the student must be assigned an employee identification, LDAP username and password. A JHQ must be completed for a student working at Berkeley Lab longer than three months and training must be completed within six months. Students at Berkeley Lab for more than one month are to attend New Employee Orientation.

There may be uncompensated students participating in Berkeley Lab research projects for a brief period of time and these individuals may not have an opportunity to receive an LDAP username and password. Under this scenario, Chapter 6 allows for student to work without formal training if the student is "supervised directly by a worker who has already obtained the required training." Those workers assigned this responsibility need to clearly understand their oversight role. This does not relieve the line manager or supervisor accountability for assuring a safe work place.

Divisions that conduct Lab-sponsored work on the UCB campus (exclusive of Donner and Calvin Laboratories) are to follow the ES&H policies and procedures within the "Partnership Agreement Between UCB and LBNL Concerning Environment, Health and Safety Policy and Procedures" (See Appendix G). Students need to be: included in campus line management work authorizations before beginning work, trained to the campus standards prior to doing work, and properly supervised.

6.0 Work Authorization: Subcontract Work

All subcontracted construction, maintenance or repair work must be authorized and released. The work planning and control process for subcontracted work includes:

- Assignment of an LBNL Authorizing Individual and Responsible Individual
- Identification of the Work Authorization Level to ensure a graded application of control
- Training requirements for designated Responsible Individuals
- Application of Integrated Safety Management
- LBNL provided Safety Orientation for all subcontract employees

All work to be performed by a subcontractor will be designated a Work Authorization Level. Work authorization levels. Work control increases as the complexity of work and hazards increase. The designation of work authorization level is designed to ensure pre-task identification of risks and a graded approach to oversight and control.

6.1 Work Authorization Level A

WAL A work activities are activities commonly performed by the public and the hazards are commonly encountered by the public. WAL A activities can be self – authorized with the knowledge of the supervisor. These activities, such as driving automobiles, riding bicycles, may proceed at an individual's discretion in accordance with generally accepted practices. Because the work is self – authorized, the individual performing the activity releases the work and is responsible for working safety. Assignment of an RI and AI is not required.

6.2 Work Authorization Level B: Standard Controls with Review

WAL B work activities involve task or area hazards beyond WAL A activities and controls. For example, work may include potential exposure to hazardous energy requiring Lockout/Tagout, working above 6 feet, work requiring a permit, traffic controls, work requiring safety glasses and hard hat. Such activities require a detailed scope of work and hazards analysis, authorization and documentation. The work activity task and area must be clearly described. The AI authorizes the activities, with concurrence of the EHSS team lead, the RI and the Facility Manager. The authorization is based upon determination that funds are available, activity description is accurate and well defined, associated hazards have been identified and necessary controls identified. The RI confirms description of work, hazard controls, availability of materials and qualified and trained workers. The RI releases the work and provides monitoring and oversight of the work.

6.3 Work Authorization Level C: Supplemental Controls

WAL C work activities involve more significance hazards and environmental effect that WAL B activities. Work may include High Risk activities; expose to hazardous energy (electrical >480v), exposure to hazardous materials, excavation or trenching greater than 6 feet. WAL C activities require a detailed scope of work and hazards analysis a task specific Safety Plan, authorization and documentation. The work activity task and area must be clearly described. The AI authorizes the activities, with concurrence of the EHSS team lead, the RI and the Facility Manager. The authorization is based upon determination that funds are available, activity description is accurate and well defined, associated hazards have been identified and necessary controls identified. The RI confirms description of work, hazard controls, availability of materials and qualified and trained workers. The RI releases the work and provides monitoring and oversight of the work.

7.0 Performance Monitoring and Feedback

7.1 Self Assessment Process

Managers and supervisors must ensure that operations under their control meet all EH&S requirements and they adhere to good safety practices. The EH&S Self-Assessment Program uses performance objectives and criteria based on the core ISM functions and guiding principles to evaluate the EH&S performance at all Laboratory levels and for work both on and off site. The Facilities Division annual self-assessment report is a continuous process of information gathering and evaluation.

The Facilities Division participates in the EH&S Self Assessment Program. As part of this program a Penetration Permit Technical Assurance Plan (TAP) review is completed annually. The frequency of this review may be increase as deemed necessary by the Division.

The Division will develop a team consisting of rotating Supervisors, Employees, and the Division Safety Coordinator/Manager. This Safety “Red Team” is designed to examine safety related activities and occurrences to promote resolution of issues, contribute to a safety work environment and achieve exemplary safety performance in a cooperative effort. The Red Team will observe work in the field, inspect work areas, interview employees, managers, supervisors, and department heads as necessary or in conjunction with the Division EH&S Self Assessment Plan.

7.2 Division Walk-around Inspection Process & Schedule

A process that identifies workplace hazards and at-risk behaviors on a regular basis is one of the most effective injury prevention strategies of any Safety Management System. These hazards and behaviors are identified through safety inspections. Scheduled inspections are required by OSHA and are basic to the implementation of LBNL’s Integrated Safety Management (ISM) Guiding Principles and its Core Functions. When conducted by a worker’s supervisor, the Lab’s commitment to safety, as well as its expectation of the delivery of quality service is emphasized.

7.2.1 Responsibility

Facilities Supervisors, Project Managers, and Construction Managers must conduct and document safety inspections / observations in work areas and projects under their control according to the minimum schedule provided in section 7. These inspections are intended to identify and mitigate physical or environmental hazards and at-risk behaviors (i.e., unsafe acts or the omission of safety procedures, rules or best practices that could contribute to injuries, illnesses or incidents). Division Senior Managers must ensure that inspections are conducted as expected.

When conducting safety walkaround inspections, be cognizant of the fact that the inspection can be distracting to the worker. If the inspection requires prolonged observation of an individual or group of workers, inform them of your purpose and that your objective is not to “catch them doing something wrong.” It is best to employ indirect observation when possible. Avoid prolonged conversations with

workers inspected. If there is a need to stop work, do so in a manner that does not cause a greater hazard.

7.2.2 Frequency

The frequency and scope of the Facilities inspections is determined by Facilities Division Management and compliance is monitored by the Facilities Division Safety Team. The required frequency is adjusted on an individual basis according to the absence of a sufficient number of active projects or vacation schedules. A report of individual inspections performed is provided to Division Management monthly. Division Senior Managers must ensure that inspections are conducted as expected.

Safety inspections / observations will be conducted and documented according to the following schedule:

Unit	Group	Frequency
MRO, Design and Construction	Department Heads	1 per quarter
MRO	Supervisors	2 per supervisor per week
MRO	Work Leads	1 per work lead per week
Design and Construction	Responsible Individual (CM)	2 per RI per week*
Design and Construction	Authorizing Individual (PM)	1 per AI per week*
Executive Safety Walk Around	Department Heads	1 per quarter
Business Center	Work Area Inspections	1 per quarter
Engineering	Engineers	TBD

* Project Managers, Construction Managers, and Superintendents will conduct daily site inspections according to the procedures outlined in the Capital Projects Procedure Manual. This inspection will include a review of permits and their posting, safe work practices and conditions, identify look ahead tasks that may require safety attention. All levels of Capital Projects management are responsible to ensure that proper and complete safety oversight of projects is maintained from the design phase through completion of the project.

7.2.3 Recordkeeping

The results of each inspection will be documented to include the name of the person conducting the inspection, the area / project inspected, date, and the number of “good” versus “at-risk” behaviors or hazards observed. A brief description of the behavior or hazard, including immediately corrected actions, will be included on the document. This documentation requirement can be satisfied

through entry into the FieldID Inspection Software or forwarding the information via email to Facilities Safety Management.

The results of each inspection are documented within the database system described in section 9 to include the name of the person conducting the inspection, the area / project inspected, date of the inspections, and the number of "at-risk" behaviors or hazards observed. Observations are ranked according to risk (De Minimis, Low, Medium, or High as defined in LBNL Pub 3000) and the system can assign an error precursor to the observation for later trending. A brief description of the behavior or hazard, including immediately corrected actions, is included as part of the inspection documentation.

High risk tasks and processes should receive increased attention by the inspection process. Inspection checklists are developed to focus attention on these tasks. Inspectors are trained to select higher risk operations for their inspections.

7.2.4 Correction of Identified Hazards and Behaviors

Hazards identified through an inspection that are high risk or considered to be Immediately Dangerous to Life or Health (IDLH) will be immediately corrected or work will be paused and workers removed from the hazard. Facilities Senior Management and the project Construction Manager are immediately notified of high risk hazards. Facilities Senior Management is also notified of all potential incidents through the Division's Incident Notification process.

Hazards not immediately corrected will be entered into the Corrective Action Tracking System (CATS) or a Work Order will be generated. At-risk conditions (hazards) and behaviors identified by BSO inspections are captured on a "Smartsheet" by Facilities Safety. Unresolved conditions are reviewed by Facilities Safety weekly who will manage the unresolved conditions to completion.

Facilities Safety will propose draft corrective action to Facilities Senior Management during the monthly Executive Safety Committee meeting for adverse trends identified and will manage the completion of the corrective actions (this may include entry into the Corrective Action Tracking System). Facilities Senior Management will define final corrective actions, based on these trends as appropriate. If significant high risk trends are identified prior to the monthly meeting, Facilities Safety will elevate the trend to Facilities Senior Management and/or Construction Management as appropriate. Additionally, Construction Managers are encouraged to discuss corrective actions based on the trends at the monthly RI meeting.

7.2.5 Metrics and Reporting

Facilities Safety will collect, trend, review and report safety inspection data to the Facilities Division Senior Managers each month at the Division Executive Safety Committee meeting. DCM/MRO inspection findings that result from LBNL Safety Division Construction Safety inspections are compiled and included in the monthly report. In particular, Facilities Safety will focus trending on:

- Type of hazard or at-risk behaviors by risk
- Location of hazards or by project
- Error precursors
- Compliance with inspection goals and expectations
- Other metrics that identify potential areas of risk that indicate the need to focus additional safety controls or other corrective action

DCM project safety inspection data is reviewed by Facilities Safety weekly and a summary report of findings is forwarded to Division Senior Management. The weekly summary report will:

- Highlight medium and high risk hazards
- Combine DCM / MRO observations by type and risk
- Breakdown significant risk categories
- Identify unresolved at-risk conditions or behaviors

Trends are also reported and discussed with Project and Construction managers at the monthly Responsible Individual (RI) Roundtable meetings.

7.2.6 Training

Individuals tasked with the responsibility to conduct inspections attend a training session that describes the purpose of inspections, their roles and responsibilities as inspectors, and how to conduct high quality safety inspections that return the greatest value. A separate hands-on training session is conducted to allow inspectors to become proficient in the use of the data capture software. Components of the training include:

- Elements of a field observation
- Value added-what's in it for the inspector
- Identifying at-risk behaviors
- Identifying non-compliance
- Observing work area issues
- Listening and asking
- Stop work
- Software use and installation
- Program log-in
- Entering findings and risk
- Assigning corrective actions

7.2.6.1 Mentoring for Improvement and Program Review

The Facilities Division Safety Team will provide ongoing training and mentoring of the inspectors to ensure the continued quality of the inspections.

Mentoring conversations will be held with each inspector annually. As determined necessary by the Safety Team or as requested by the inspector, members of the Safety Team will accompany persons on their inspection.

To help ensure continuous improvement, inspections will be reviewed by Facilities Safety to identify areas where inspectors can increase the quality of their inspections. This will include:

- Are hazards discovered during injury or incident review that should have been recognized and corrected by the regular inspection process?
- Are there too many inspections with zero findings?
- Are hazards found during inspections tracked to correction?
- Are inspections being performed at the correct rate?
- Has the program improved incident or injury statistics?
- Are all work areas, employees, and processes being inspected?
- Are inspections increased for at-risk work?

7.3 Injury & Illness Reporting, Tracking, and Analysis

The Environmental Health and Safety Division (EH&S) investigates injuries and may complete a Root Cause Analysis of the injury. Facilities safety may elect to participate with EH&S or conduct its own separate investigation. The Division Safety Manager tracks injuries. Analysis is performed to determine areas that need improved safety processes and or procedures. These trends are reported to the Executive Safety Committee on a monthly basis. Corrective actions are entered into the Corrective Action Tracking System (CATS). See Section 6.5 below.

7.4 Tracking of deficiencies (CATS)

The CATS database is an online tool used to identify, track, and resolve safety issues by their associated corrective actions. Overdue CATS are tracked and reported to Division Senior Management on a monthly basis.

7.4.1 Corrective Action SMART review and CATS input

Facilities Safety and the Deputy Division Director will check that all recommended corrective actions follow the SMART format. Once recommended corrective actions are reviewed and accepted by the assigned responsible individual, Facilities Safety will enter the issue into the Corrective Action Tracking System (CATS).

7.4.2 Corrective Action Adequacy and Validation

Facilities Safety will close all corrective actions by the due date by uploading objective evidence into the Corrective Action Database after the evidence is verified to demonstrate the issue is resolved in a manner that addresses the intent of the corrective action, and that the corrective actions are sustainable and measurable. In cases where evidence is lacking, or if the evidence suggests the corrective action was not implemented as intended, action is taken to correct the deficiency. Therefore, individuals assigned responsibility for corrective actions must forward the objective evidence of closure to Facilities Safety no later than three weeks prior to the due date.

Corrective action implementation is reported to Division Senior Management and to the KFA metrics meeting monthly.

7.5 Mishap Reporting and Investigation (e.g., ORPS, Near Miss, SAARs)

The Occurrence Reporting and Processing System (ORPS) at LBNL notifies and keeps laboratory management and applicable elements of the Department of Energy informed of abnormal occurrences that could adversely affect:

- The health and safety of employees, guests, visitors, and the general public;
- The environment;
- The intended purpose of LBNL facilities; or
- The credibility of the DOE and/or LBNL.

All Facilities Division employees must immediately notify the Work Request Center of any failure of a service, system and/or utility, or any occurrence (possible ORPS) that has the potential to significantly impact safety (major injuries), science and / or business. Work Request must then forward this information to the Facilities Management Team responsible for Incident Notification and ORPS reporting.

Facilities Safety monitors the causal and apparent cause reporting to help ensure the timely completion of Occurrence Reports and that corrective actions are effective and sustainable. Causes are trended and reported to Division Management. Additionally, incidents that are considered "Sub-ORPS" (Institutional Reportable) are also tracked, trended and reported to Division Management. Division Management will determine if fact finding or causal analysis of the Sub-ORPS are warranted.

EHS completes the Supervisor's Accident Analysis Report (SAAR) subsequent to an injury that the supervisor must review and approve within 7 days of the date the injury was reported.

7.6 Design Phase Activities

Safety requirements, hazards, conditions and mitigation will be identified in the project planning and design phase of capital and small projects with pertinent safety requirements built into the project and look ahead schedules.

7.6.1 Hierarchy of Controls

Foreseeable safety hazards will be identified and mitigated in the design phase of projects using the Hierarchy of Controls as specified in the American National Standards Institute (ANSI) Z10-2005 Occupational Health and Safety Management Systems. Hazards identified through walkaround or other means will be corrected using the same methods.

7.7 Work Alone Policy

EH&S policy does not allow workers at the Laboratory to work alone when the mitigated hazards associated with their work could incapacitate them to such a degree that they cannot “self-rescue” themselves or activate emergency services. During the Work Authorization development and review process, authors and reviewers will determine whether and when a Working Alone restriction is necessary and include it within the controls listed in the Work Authorization Document. This Working Alone restriction will then flow down to individual workers through their JHA or other authorization, e.g., AHD. Work Leads may also determine that a Working Alone restriction is necessary for individual workers whose assignments are not covered by a Formal Authorization and place the restriction in the individual’s JHA. For construction activities, the policy is implemented through the Construction Safety review process; and for non-construction subcontractors, it is implemented through the Subcontractor Job Hazards Analysis and Work Authorization (SJHAWA) process. For additional information see Pub 3000 Section 5.3.

8.0 Qualification and Training

Competence commensurate with responsibilities is one of the DOE’s seven guiding principles. For every individual engaged in activities other than office work, their supervisor or manager will determine the requisite qualifications and training to function safely, and will document that the employee possesses these qualifications and training. Until such qualifications and training have been established, individuals will only be allowed to work under the direct line of sight supervision of a qualified employee. The LBNL Job Hazards Questionnaire (JHQ) and Training Database are mechanisms used to record course requirements and their completion that establish these qualifications. Contract labor employees, guests and students who will be at LBNL for more than 30 days are treated in the same manner as career employees for the purposes of training and qualification.

Qualifications include skills, knowledge, training, and certifications required by law or by Berkeley Lab policy. They may be documented in any manner chosen by the supervisor or manager provided a copy is retained in the employee’s personnel file. For contract labor employees, such documentation will be furnished according to the requirements of

the EH&S subcontractor Job Hazard Analysis and Work Authorization (SJHAWA) program.

Applicable information from the Laboratory's lessons-learned program and division occurrence reports will be disseminated to employees and contract personnel for accident prevention and hazard awareness. Facilities Safety will distribute or re-distribute lessons learned to the appropriate personnel, including construction managers for use in their Plan of the Day Meetings.

8.1 Supervisor Training

All Facilities supervisors are required to complete the training class, "EH&S for Supervisors" (EH&S20). In addition, all shop "craft" supervisors are required to take "Safety for Shop Supervisors" (EH&S023). "Safety Walkaround" (EH&S0027) is also required for those supervisors required to complete safe work inspections (see Section 6.2 above).

Line managers are responsible for analyzing the work of persons under their direction and for assuring that the proper training for the safe conduct of the work is completed. Until an individual has been properly trained, s/he will only work under the direct supervision of someone who is already trained.

8.2 Employee Training

Employees must complete all required training within the appropriate time frame. Supervisors and Managers must ensure that all personnel under their supervision satisfy pertinent EH&S training requirements before beginning work or within the first 90 calendar days of beginning work or initiating work that introduces new hazards.

New employees and participating visitors, who will be at LBNL for more than 30 calendar days, must complete the Job Hazard Questionnaire.

Workers must complete the Job Hazards Analysis and have the work authorized before beginning work. If an employee does not have a current work authorization, they may perform work that has been analyzed for someone else provided that:

- They are directly supervised by that person
- The supervising person has been authorized to perform the described work
- Both employees adhere to the controls specified for that work

8.3 Responsible Individual Training

Subcontractors performing construction, maintenance or repair work at Work Authorization Level B or C requires oversight by a Responsible Individual. Those individuals designated as RI's are required to attend Laboratory provided training prior to taking on the role of RI. The RI's are also required to attend the monthly RI round table. Refer to Design and Construction Procedure DCM-001 for more information.

8.4 Medical Surveillance

The purpose of medical surveillance is to identify and monitor LBNL employees who work under conditions and with materials that have a potential health risk. Exams are done in order to prevent occupationally related problems in a preclinical stage, so that they may be easily managed. Some training requires a medical examination and approval before certification is issued. Examples of training courses that require a medical examination are Crane/Hoist Operator Training, Powered Industrial Truck Operator Training, and Half/full Face Mask Respirator Training.

8.5 Safety Meetings

The individual departments within Facilities will conduct formal safety meetings bi-weekly and document these meetings on a standard form. Completed forms are forwarded to Facilities Safety for tracking and achieving. Meetings may include a discussion of topics and issues relevant to the department, training in subjects to prevent incidents and injury and to provide a forum to raise safety concerns without a fear of retaliation. Facilities Safety will develop a craft specific schedule of training topics that are expected to be presented at the meetings. Safety will also develop a tool kit to assist presenters with the delivery of consistent and accurate safety information. These topics are not intended to preclude a discussion of timely, relevant topics during the meetings. Additional materials in form of power point presentations, pamphlets, handout material, and video training are available from the Facilities Safety Department. Facilities Safety personnel are available to assist or conduct these meetings.

Sub-contractors are expected to hold safety meetings as required in the Facilities Construction Subcontractor Safety Handbook that includes at a minimum:

- Pre-start meetings
- Safety Orientation
- Weekly Tool Box Safety Meetings
- Plan of the Day meetings.

8.6 Development of Internal Safety Training

Safety training and orientation programs developed within the Facilities Division will follow the training program design elements found in OSHA's best practices in training guidance. This will include Construction Safety training programs.

9.0 Emergency Preparedness Measures

The Facilities Division has revised its existing Building Emergency Plan and Teams (BET). The BET meets on a monthly basis to address emergency response issues and requirements, share information, and receive training and practice skills. Because an effective response is dependent on the above, managers must allow full participation in these meetings by team members.

10.0 Reporting Employee Concerns

A variety of formal communication methods are established at LBNL that enable Division employees to report environmental health and safety concerns or suggestions. Employees may file a concern directly with their division director, department head, immediate supervisor, or division safety coordinator, as well as seek assistance from EH&S, the Laboratory Ombudsman, or the Department of Energy. Persons reporting hazards or improper activities are fully protected by law and Lab policy against retaliation.

The available reporting mechanisms include:

LBNL Safety Concerns Web Page	http://www.lbl.gov/ehs/refs/safety_concern.shtml
LBNL Internal Whistleblower Hotline (24-hr. voicemail)	1-510-486-6300
U.S. DOE Employee Concerns Program Hotline (24-hr)	1-800-701-9966
EthicsLine (24-hr., third party administered; confidential)	1-800-999-9057
University-wide Hotline	1-800-403-4744
California Bureau of State Audits	1-800-293-8729
EH&S Suggestion Box	http://ehswprod.lbl.gov/mis/suggestions/suggestionsForm.asp
Laboratory Ombudsman	H_Reed@lbl.gov <H_Reed@lbl.gov>

The Facilities Division sends out a semi-monthly feedback report which addresses employee concerns.

The Division Zero Accident Council (DZAC) is an opportunity for employees' from all sections of the Division to forward safety concerns through area representatives to Division Executive Management. The representatives in turn present the DZAC meeting minutes to their work groups. Sign in sheets are gathered and attendance is monitored so that all work groups remain represented in the Council. The council meets every month and representatives must send an alternate if they are unable to attend.

11. Balanced Resources

The Division will incorporate appropriate resource allocation for ES&H concerns and, to include provisions for safety equipment, permits, training, maintenance, permits, waste disposal, and facilities modifications. Division management will allocate appropriate resources to implement the ISM plan and program.

11.1 EH&S Resources

To facilitate implementation and execution of this Division's ISM program, the following resources are made available:

- 1 FTE Division Safety Coordinator
- 1 FTE Division Safety Manager

1 Term LOTO Coordinator

The following resources are made available by the EH&S Division on a matrix basis. They are available to assist Division Management and Staff with aspects relating to the implementation of this program.

0.5 FTE Division Liaison

As Required: Other EH&S Division staff/subject matter expert(s)

11.2 Performance Metrics

Safety goals and expectations are established (zero injuries) and communicated to all levels of the Division. Leading and lagging indicators are tracked and trended for management review and action.

Appendix A

Guidelines for the Development of Internal Safety Training

The following training program design elements are based on OSHA's best practices in training guidance. Please use this guidance when developing internal safety training.

Introduction

A general review of training "best practices" reveals four characteristics that sound training programs have in common. The best training programs are accurate, credible, clear and practical.

Accurate. Training materials should be prepared by qualified individuals, updated as needed, and facilitated by appropriately qualified and experienced individuals employing appropriate training techniques and methods.

Credible. Training facilitators should have a general safety and health background or be a subject matter expert in a health or safety-related field. Practical experience in the field of safety and health as well as experience in training facilitation contribute to a higher degree of facilitator credibility.

Clear. Training programs must not only be accurate and believable, but they must also be clear and understandable to the participant. If the material is only understandable to someone with a college education or someone who understands the jargon, then the program falls short of meeting workers' needs. Training materials should be written in the language and grammar of the everyday speech of the participants. Training developers should ensure that readability and language choices match the intended audience.

Practical. Training programs should present information, ideas, and skills that participants see as directly useful in their working lives. Successful transfer of learning occurs when the participant can see how information presented in a training session can be applied in the work place.

Needs assessment. Safety and health training should be preceded by a needs assessment to ensure the training meets the needs of the participants. Needs assessments can also be used to learn more about your target populations' knowledge, experience, learning styles, reading and writing skills, and interests.

Training techniques, methods and modes.

1. Proven adult learning techniques should be at the core of training development and delivery.
2. Peer-to-peer training with activity-based learning is one effective model for worker training. Effective development of peer trainers requires ongoing organizational support to the developing peer trainer.

3. Training must be provided in a way that workers receiving it can understand. In practical terms, this means that the training must be both in a language and vocabulary that the workers can understand.

About Adult Learning:

General Principles

The best training programs take advantage of the following characteristics of adult learners:

- Adults are self-motivated.
- Adults expect to gain information that has immediate application to their lives.
- Adults learn best when they are actively engaged.
- Adult learning activities are most effective when they are designed to allow students to develop both technical knowledge and general skills.
- Adults learn best when they have time to interact, not only with the instructor but also with each other.
- Adults learn best when asked to share each other's personal experiences at work and elsewhere.

Three kinds of "learning exchanges" should be used during training:

1. Participant-to-Participant: "Participant-to-participant" learning exchange recognizes that participants can learn from one another's experiences. Participant-to-participant exchanges should be a key feature of the training.
2. Participant-to-Facilitator: Facilitators can learn as much from training sessions as participants do. On many subjects, a group of participants may have more extensive knowledge and experience in certain areas than a facilitator.
3. Facilitator-to-Participant: Classroom learning needs structure. A facilitator's role is to guide discussions, encourage participation, draw out and/or add information as needed, and highlight key issues and points.

Elements of Training Program

In the Design, Delivery and Evaluation of training programs there are six main program elements that should be considered; these elements are: Staffing; Training Facilities and the Learning Environment; Training Course Materials and Content; Training and Overall Program Evaluation, which also includes information on documentation and recordkeeping; Training Program Quality Control; and Specific Populations to Consider. This section provides best practice guidelines and techniques to help organizations organize and plan for a high quality and effective training program.

Element One.

There are two major staffing roles: Training Process Owner (Process Owner) and Instructor.

Process Owner. Each training program should be under the direction of a Process Owner who is responsible for the program. The Process Owner's role is to provide

leadership and to ensure the usefulness of appropriate worker health and safety training programs. The Process Owner will enact a plan for quality assurance and program evaluation; will collaborate with EHS and seek review and input from EHS of all course materials and other training aids. Process Owner will create and maintain a written Quality Control and Evaluation Plan.

Responsibilities:

Review of training materials. The Process Owner should ensure the review and approval by EHS (if appropriate) of all course materials and other training aids, including but not limited to course syllabus for each course offered, trainee manuals, instructor manuals, audio-visual aids, enhanced technology methods, handouts, demonstration equipment, hands-on equipment, and other such training materials prior to their initial use and as needed thereafter.

The Process Owner may wish to have training materials peer reviewed by technically competent external reviewers or by a standing advisory board established for that specific purpose. These reviewers should possess relevant expertise and experience in the disciplines appropriate to the course subject. It is advisable that one or more of the reviewers be an experienced worker representing those to whom the training is directed. Having your materials peer reviewed by those with relevant expertise has proven useful in other programs.

Quality Control and Evaluation. The Process Owner should develop and maintain a written Quality Control and Evaluation Plan. At least annually, the Process Owner should conduct or have someone else conduct a written program quality control audit based upon that plan, which should be in writing. Program modifications to address identified deficiencies, relevant new standards or regulations, or new training methods should be documented, approved and implemented. The audit and program modification documents should be maintained by the training provider. Program quality control audits should follow the guidance in section five: Training Program Quality Control.

Instructor (which may be the Process Owner). A person prepared by education, training or experience to develop and implement various elements of a training program. Instructors should be deemed competent by the Process Owner to instruct specific courses based on an annual evaluation of instructional competence.

Instructional Staff

Must be competent via experience, education or training to instruct specific courses or training components.

Element Two

Training Facilities and the Learning Environment

Training facilities and resources. Adequate and appropriate facilities for supporting the training include the following:

Sufficient space for all attendees to sit comfortably during instruction; Sufficient room set-up for participants to interact with one another; Enough equipment for all attendees and demonstration equipment for the instructor/facilitator (if applicable); Space and facilities

for small group exercises or hands-on training using equipment as part of activity-based learning; and Equipment, technical support, and resources sufficient to support training via technology, such as during instructor presentations or web based training used by students to enhance learning (if applicable).

Environmental and Learning Needs Assessments:

1. Does the learning environment encourage active participation?
2. Does the social environment or atmosphere in the learning environment encourage people to participate?
3. Does the program effectively promote participatory learning activities?
4. How effectively does the organization of the program encourage participation?
5. Is the program sensitive to literacy differences?
6. Do the audio-visual aids used by the training program encourage participation?

Instructor-trainee ratios. Class sizes of about 25 people (or less) work best, especially when incorporating activity-based learning into the training experience. When class size exceeds 30 people, it is advisable to provide a second instructor and divide the class into two sections during instruction.

Element Three

Training Course Materials and Content

Training development / Instructional design. Training courses should be developed and updated as necessary to be consistent with the recognized principles of training development / instructional design.

Training development should follow a systematic process that includes:

- a needs assessment,
- learning objectives,
- elements of adult learning principles,
- course design,
- evaluation.

Training materials and content are produced as the course author progresses through the instructional design cycle.

First a training analysis is performed, then the structure of the course is designed, next specific content is developed, the course is implemented or presented, and lastly the course is evaluated. Particular attention should be devoted to the following with respect to course design and content: Demographics of the training target audience and their training needs.

Training objectives. Every instructor has objectives he/she wishes to accomplish during training. Instructional objectives should be student-focused and state the desired learning outcome. However, it is necessary to note that, while good training can be provided, workers can still face difficulty at work when raising their voices to try to get problematic conditions corrected. When constructing objectives, the main question that

objectives answer is: What should the participant be able to do differently, or more effectively, after the training is completed?

The SMART Model is one method used to construct practical objectives:

"S" stands for Specific. Objectives should specify what they need to achieve.

"M" stands for Measurable. You should be able to measure whether you are meeting the objectives or not.

"A" stands for Achievable. Objectives should be attainable and achievable.

"R" stands for Relevant. Objectives should lead to the desired results.

"T" stands for Time-bound. When do you want to achieve the set objectives?

Participatory Methods of Instruction

Participatory training methods draw on participants' own experiences. They encourage teamwork and group problem solving. Participants have the opportunity to analyze health and safety problems in a group and to develop solutions. There can also be valuable exchanges between workers and trainers about their lives and work. They also allow the instructor to observe who may be having difficulty with the concepts and to engage with them to ensure comprehension. Participatory methods 1) draw on the participants' own knowledge and experience about health and safety issues; 2) emphasize learning through doing without relying on reading; and 3) create a comfortable learning experience for everyone.

Training Materials

Training materials, such as handouts, PowerPoint presentations, or flip charts, are often used as visual aids that facilitate and enhance the student's learning experience. Materials should be easy-to-read and should highlight the most important messages or needs. Keep in mind that visual aids - such as PowerPoint presentations, handouts, overheads, and flip charts - play a supportive role to the main teaching technique and do not substitute for teaching. The following are some principles for creating the text for easy-to-read materials:

Identify the "priority message." The priority message should convey the most important information about a problem and how it could be solved. It should be short, informative, and easy to remember. Don't offer so much information that a reader could feel overwhelmed. Organize text into short, logical sections by using headings or subtitles. Use words that are easy to understand. Define technical terms or jargons. Keep sentences short and simple. Use a conversational style and active voice, such as the kind of language that the students use.

Using PowerPoint. PowerPoint is not a teaching technique - it is a visual aid that can be used to enhance learning, just like flip charts, overheads, and handouts. PowerPoint will not, in and of itself, improve student learning. It is the way that instructors use PowerPoint that can encourage learning. Deciding when, where, and how it can be used appropriately is the key. Many instructors mistakenly use PowerPoint as their main teaching technique. If an instructor teaches only by showing and reading a PowerPoint presentation, there is not much opportunity for participation. In fact, use of PowerPoint can stifle participation. The teaching turns out to be "one way", similar to the "traditional" model of education with the instructor as expert and the students as just the receivers of

information. As mentioned previously adult education is most effective when it is participatory - when students are active participants in the learning process.

There are three main issues to consider when using PowerPoint: content, design, and delivery.

Content:

If you are creating PowerPoint presentations, it is best to plan your workshop or class first and then write the content of the PowerPoint slides. Include the main points, not lots of text.

Design:

One concept per slide. Use a simple design. Make sure you really understand how to create and design PowerPoint slides. It takes some knowledge and skill to develop a PowerPoint presentation. For instance, getting the animation correct can be tricky. Do not make the mistake of designing the PowerPoint with too many graphics and animation (a common error among instructors). This can result in design that is too complicated and difficult to read. Go easy on the graphics. Simple graphics that are easily understood are best. Do not use graphics just to make a slide look good; only use them if they have some content value. Keep animation to a minimum. Use lots of white space. Use contrast: dark on light, or light on dark. In choosing colors, make sure that the text is easy to see. Design from top left to bottom right. Use large font sizes (26 point minimum). No more than two fonts on a page. Limit use of bolding, italics and underlining.

Delivery:

Your slides should serve as a focal point for the issues to be discussed. Use them to help control the pace of presentation and discussion. Read a slide aloud and follow with commentary, explanation and discussion. Remember questions and discussion are part of the learning experience. Practice using the PowerPoint before you actually use it in a class. Make sure you are comfortable moving between slides and between information in slides.

Element Four

Training and Overall Program Evaluation

Training Evaluation:

Training Reaction Survey. Training reaction surveys measure the trainee's immediate perceptions of the quality and usefulness of the training. The results should be considered when improving the program since they provide information regarding relevancy of information and the teaching style of the instructor. A reaction survey is a subjective evaluation of the training course by the trainees. Questions about trainer presentation skills, accommodations, the course's pace, and difficulty and usefulness of content may be included in a reaction survey. Reaction to training can be conducted by:

using participant feedback questionnaires or gathering informal comments from participants.

Overall Program Evaluation

Key questions for evaluating the overall quality and appropriateness of a training program should include the following:

- Were the program objectives clearly stated?
- Were appropriate facilities and staff available and committed to the program?
- Was there an appropriate mix of classroom, demonstration, and activity-based learning?
- Did new training technologies that have been integrated impact the program being assessed?
- What are the program's strengths?
- What are the program's weaknesses?
- How can the program be improved?
- Are trainers using the training outline, objectives and content provided?
- Are the course materials current and the delivery methods relevant to the training target audience?

Documentation and Recordkeeping.

A record keeping system should be established for controlling all records and documents to ensure that the records are:

- Retrievable, readily identifiable, and maintained in an orderly manner;
- Dated, current, accurate, and legible; and
- Retained for at least one year following the training.
- Student records should identify:
 - The target audience and stated learning objectives;
 - Sources used to develop the training materials;
 - The persons designing and developing the training and their qualifications;
 - All training materials developed for the course; and
 - Plans for evaluation and continuous improvement of the course.
- Trainer records should identify: Date, location and duration of the training; Course name; Name(s) of the trainer/s;
- Materials used; and List of trainees participating in the class. Course evaluation records.

Element Five

Training Program Quality Control.

Written quality assessment and control plan will help ensure the overall quality of your training program. A quality control plan is not the same as training evaluation. A quality control plan can ensure that each element of your training program is being done well and achieving its goals. It provides a tool with which to review your training program. While not necessarily all inclusive or stringent, written quality assessment and control plan that considers the adequacy and appropriateness of the overall program. Process Owners review the written quality assessment and control plan periodically and update it as appropriate.

Quality Control Program Assessment.

Maintain a written quality assessment and control plan that considers the adequacy and appropriateness of:

Instructor performance; Course evaluations, including feedback, updating, and corrective action; the role of trainee evaluations to provide feedback for training program improvement; Course materials;

Annual Update.

The Process Owner should review the written quality assessment and control plan periodically and update it as appropriate. The periodic update provides an opportunity to consider how well the program has:

Included all applicable regulatory changes; Implemented course updates that have occurred during the preceding year; Integrated new training technologies; and Integrated new modules within the training program.

Element Six

Specific Populations to Consider:

1. Non-English speaking. A person's verbal ability often tends to exceed his or her literacy levels. For best results, trainers should communicate in the native language of the participants and should provide materials in the participants' primary language. If the trainer does not speak the trainees' primary language, interpreters may be used. However, be sure to use a translator with trusted credentials. It is not advisable to use one worker as a translator for the others. Employ approaches similar to those used for low literacy audiences.
2. Limited English proficiency. Materials used with those who have limited English proficiency should be easy to understand or written in languages other than English. Favor those materials or curricula that encourage interaction, student input, and critical thinking. Consider using pictograms, visuals, and demonstrations or other methods that are non-verbal to convey information. Employ approaches similar to those used for low literacy audiences.
3. Contingent workers, day laborers and temporary workers. Employ approaches similar to those used for low literacy or non-English speaking audiences. This will ensure maximum communication of the training content with minimum language interference. Favor visual and verbal methods over written text.
4. Young Workers. Workers who are high school or college age and recent additions to the workforce require additional guidance. They may be fully able to intellectually comprehend training information, but they lack the experience that time in the workforce provides. Additional emphasis should be placed on safety and health precautions, experiential exercises and demonstrations that exhibit the inherent danger that lurks in the workplace.

Submitted by Matt Vail.

Signatures:

Submitted By:

Joe Dionne
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Date

Accepted:

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Date