Introduction to Integrated Safety Management
at the
Accelerator Technology and Applied Physics Division

Integrated Safety Management (ISM)

ISM is a system developed by the U.S. Department of Energy (DOE) and implemented by its contractors to integrate environmental management and worker health and safety requirements into the planning and execution of work at all levels.

DOE has defined **seven Guiding Principles** that are the fundamental policies for DOE and its contractors to use in the management of Environmental Safety and Health (ES&H), described in detail in **ES&H Manual, Section 1.6**. They are:
1) Line Management Responsibility and Accountability for ES&H;
2) Clear Roles and Responsibilities;
3) Competence Commensurate with Responsibilities;
4) Balanced Priorities;
5) Identification of ES&H Standards and Requirements;
6) Establishment of Hazard Controls; and
7) Work is Authorized.

In addition, the LBNL ISM process includes:
8) Subcontractor Flow-Down of Safety and Health Requirements; and
9) Requesting a Variance from LBNL Safety Policy.

DOE has defined the following **five Core Functions** for integrated ES&H management that make up the underlying process for any work activity that could affect the public, the workers, and the environment:
1) Define the Scope of Work. Missions are translated into work, expectations are set, tasks are identified and prioritized, and resources are allocated.
2) Analyze the Hazards. Hazards and environmental impacts associated with the work are identified, analyzed, and categorized.
3) Develop and Implement Hazard Controls (including environmental controls). Applicable standards and requirements are identified and agreed upon, controls are established to prevent and/or mitigate hazards, environmental impacts are identified and evaluated for reduction, the ES&H envelope is established, and controls are implemented.
4) Perform Work within Controls. Readiness is confirmed and work is performed within the ES&H envelope established.
5) Provide Feedback and Continuous Improvement. Feedback information on the adequacy of controls is gathered, the efficiency of reducing environmental impacts is researched, opportunities for improving the definition and planning of work are identified and implemented, line and independent oversight are conducted, and, if necessary, regulatory enforcement actions occur.

LBNL's ISM system is described in greater detail in the **Integrated Safety Management Plan for Berkeley Lab.** Each LBNL division has its own ISM Plan to describe how ISM is tailored and implemented for the division's work and hazards.

ISM at the Accelerator Technology and Applied Physics Division (ATAP)

ATAP conducts basic and applied research and development in all areas pertaining to the physics and technology of beams. In addition, it operates major LBNL facilities that exploit accelerated beams for use in basic and technological research. Divisional activities encompass the conception, design, construction, and operation of accelerators and storage rings for scientific and technological research, for fusion-energy experimentation, and for industrial and medical applications, as well as the development of superconducting magnets, beamlines, and other components for use in such machines. Current ATAP operations include particle beams, superconducting and normal conducting magnets, lasers, laboratories, machine and electronics shops, fabrication areas, storage space, and office spaces.

Some ATAP personnel conduct work at the Advanced Light Source, Rutherford Backscattering Spectroscopy system, 88-Inch Accelerator, and other LBNL facilities. ATAP personnel may also work on the University of California campus and at other off-site locations. Personnel from other organizations, including affiliates (visitors, guests, and students) work at ATAP facilities.

The hazards associated with operations at ATAP are described in the LBNL **Hazards Management System** (HMS) database. The HMS database is one of the tools used by ATAP for describing its authorized scope of work and for identifying the hazards associated with its work activities.

It is the policy of ATAP to conduct all of its operations in a manner that protects the health and safety of employees and the general public and that does not endanger the environment, as defined by the Laboratory's Environment, Health & Safety (EH&S) policies and requirements contained in the **Requirements and Policies Manual (RPM)**, **Environment Safety & Health Manual (ES&H Manual)**, and the **Berkeley Lab Integrated EH&S Management Plan**.

The ATAP ISM Plan has been established to assist in ensuring that the Division's Environment, Safety &Health (ES&H) objectives are met. The ATAP ISM Plan has been divided into modules by topic, to be posted on the ATAP Safety Website for easy access and use. Modules may contain links to key LBNL reference documents and websites. The ISM Plan also includes the ATAP Self-Assessment Plan. All modules were reviewed and updated in November 2014. LBNL is in the process of transitioning to a new Work Planning and Control system and many changes to the ES&H Manual are anticipated. There have also been Division Management changes that will require new MOUs. It is expected that there will be frequent updates to the ATAP ISM Plan this year to implement the changes. The February 2015 update incorporates changes to the Self-Assessment Plan to evaluate anticipated impacts of electrical safety requirements.

ATAP ISM Plan Website Contents

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- Chemical Owners
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- Area Safety Leaders
- Matrixed Personnel and Shared Spaces
  - MOU Between ATAP and Engineering*
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- Students and Work at UC
- Work Off-Site
- ES&H Operations Committee
  - ES&H Coordinator
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* Previous MOUs are not valid due to Division Management and EHS Policy changes. New MOUs will be added when available.

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ES&H Responsibilities for All ATAP Personnel

Safety responsibilities of employees and participating affiliates are described in **RPM ES&H Core Policy** and **ES&H Manual Section 1.7.**

Hazards Analysis and Work Authorization

Before performing work, ATAP personnel must define what will be done, analyze the hazards, determine what type of work authorization(s) are required and obtain them, and ensure the necessary hazard controls are in place. The Work Planning and Control (WPC) **Activity Manager** system is used to guide the hazards analysis process. Program, Division, and EHS staff (**ATAP ES&H Operations Committee**) are available to assist in the hazards analysis process.

New work authorizations will be established through the WPC **Activity Manager** system. Existing work authorizations, such as Activity Hazards Documents (AHDs), Individual Baseline Job Hazards Analyses (JHAs) and Task-Based JHAs will be maintained until the work is fully authorized through WPC Activity Manager.

All personnel are responsible for knowing which work authorizations apply to their work, reading and understanding the conditions, and working within the limits of their work authorizations. Under WPC, all personnel are responsible for:

- Reviewing and accepting conditions of the work authorization;
- Performing work only for which they are authorized and qualified and per requirements of ESH Manual, Chapter 1;
- Accepting primary responsibility for performing work in a safe manner;
- Stopping work when the tasks, hazards, and/or required controls differ from those authorized in the completed and active WPC Activity and not re-starting work until the WPC Activity accurately describes the work and has been re-authorized; and
- Continually reviewing work and assuring that the work activity has been analyzed and authorized appropriately under WPC and engaging the Activity Lead to modify the WPC Activity as appropriate.

Training

Required and recommended training for each person is determined by his/her work authorizations and is summarized on the Training Profile, found in the **Berkeley Lab Training (BLT) database**. The training records of personnel are reviewed for completion of required EHS courses prior to determining the appropriate level of authorization to perform work under WPC Activities. Personnel may be required to complete on-the-job training and work under supervision until they have demonstrated sufficient proficiency to work safely on their own. Annually, in conjunction with the Performance Review process, the employee's WPC Activity authorizations and status of completion of required training is reviewed by his/her Supervisor, and a training plan is

developed for each employee for the next twelve-month period. Most training courses are available on-line at the **BLT** web page. Schedules and enrollments for classroom courses are available through the **Employee Self-Service** web page.

Self-Assessment

All ATAP personnel (including ATAP employees, matrixed employees, students, and affiliates) are assigned to a **QUEST** self-assessment team, with the exception of short-term personnel. (**QUEST** is an integrated way to examine **QU**ality Assurance/ Improvement and **E**nvironment, Safety, and Health through **S**elf-Assessment **T**eamwork.) Persons whose participation in work activities at ATAP are anticipated to occur over a period of less than 90 days may be included in a QUEST team as determined by the Program Head. Advanced Light Source (ALS) Accelerator Physics personnel are assigned to ALS Division QUEST Circles. Each QUEST team has charge of self-assessment for the workspace of it members. For further information on the **QUEST** process see **QUEST**.

Responding to Emergencies and Reporting Concerns

All ATAP personnel must be prepared to respond appropriately to emergencies, including imminent danger situations, accidents, environmental releases, and natural disasters affecting LBNL (see **Emergency Response**). They are expected to follow directions from **Building Managers and Emergency Teams.**

All ATAP personnel are encouraged to implement the **RPM Stop Work Policy** for activities considered an imminent danger and **report any workplace safety or environmental concerns** to their supervisor as described in **ES&H Manual Section 1.7, Workers, #3**.

All personnel are responsible for responding to **corrective actions** assigned to them through the **Corrective Action Tracking System (CATS).** Any ATAP personnel can enter safety issues into the CATS system.

All personnel are expected to take the initiative to **consult with their supervisor** and encouraged to consult with their Activity Lead, Program ES&H Coordinator, ATAP ES&H Coordinator, or appropriate EHS personnel when safety-related assistance or advice is needed. If a person becomes aware that there may be circumstances when the person could be **working alone** and hazards remaining after controls could incapacitate him/her so that he/she could not self-rescue or activate emergency services, the work must be stopped and these concerns brought to the immediate attention of their supervisor and Activity Lead for resolution before work may resume.

Division Director

The ATAP Division Director is responsible and accountable for assuring that all ATAP activities are carried out in a safe manner, in accordance with all Laboratory requirements. The Division Director's general safety responsibilities are described in **RPM ES&H Core Policy Section E** and **ES&H Manual Section 1.7**.

The Division Director regularly participates in safety walkthroughs of Division work areas and discusses relevant safety topics in Division and Program meetings.

Under Work Planning and Control (WPC), the Division Director is responsible for:

- Assuring that the WPC process is implemented within the division;
- Assuring that all work is authorized by Activity Manager activities or facility-based authorization, as required; and
- Consulting with Program Heads to designate appropriate Project Leads and review the selection of Activity Leads.

The Division Director reviews and approves Hazard Level 3 work Activities. When the Division Director anticipates being off-site and unavailable to perform this role, the Division Director may assign this WPC role to another person through the Activity Manager database.

The Division Director is responsible for the timely **reporting of adverse and/or abnormal occurrences** that occur at ATAP facilities or operations. The Division Director has overall responsibility for ensuring occurrence reporting procedures described in **ES&H Manual Chapter 15** and the **LBNL Occurrence Reporting and Processing System** website are properly implemented and corrective actions are instituted to prevent recurrence of the occurrences. 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) in order for it to be reported; and, if so, must approve the final ORPS reports before submission to the DOE ORPS database.

The Division Director ensures that sufficient **Funding and Resources** are available to implement Division Environmental, Safety and Health (ESH) management responsibilities. The Division Director appoints personnel to perform safety roles (Division Safety Coordinator, Project Leads, Lockout/Tagout Coordinators/Approvers, Electrical Safety Advocates) and emergency preparedness roles (Building Manager, Assistant Building Manager, Building Emergency Team Leader, Building Emergency Team Member) and provides documentation of official appointments to Human Resources for incorporation into Job Descriptions and/or personnel files.

Division Deputy for Operations

The ATAP Division Deputy for Operations assists the Division Director and may act on his behalf when the Director is off-site. The Division Deputy for Operations reports to the Division Director and is responsible for management oversight of the ATAP ES&H program, including:

- Working with the Division Director to establish ATAP ISM policies;
- Serving as a member of the **ATAP ES&H Operations Committee**;
- **Promoting Safety Culture,** ES&H awareness, communication, safe work practices, and compliance within ATAP;
- Maintaining **familiarity** with division staff, work activities and potential hazards by frequently participating in safety walkthroughs and safety meetings;
- Supervising the ATAP ES&H Coordinator, including monitoring the status of required safety **documentation** and key safety **performance measures**:
    - Reviewing the ATAP ISM Plan; and
    - Monitoring monthly ATAP Safety Status reports.
- Reviewing the results of audits, ATAP self-assessments, and incident investigations. **Informing the Division Director** of audit/ assessment/ review findings and other opportunities for improvement, and **recommending changes to improve performance**; and
- Serving as a division point of contact for **Occurrence Reporting**, assists in the notification, recommended categorization, investigation, mitigation, and report preparation of all reportable occurrences within the division as described in **ES&H Manual Chapter 15**.

Division Deputy for Technology

The ATAP Division Deputy for Technology assists the Division Director and may act on his behalf when the Director is off-site. The Division Deputy for Technology reports to the Division Director and is responsible for:

- **Promoting Safety Culture,** ES&H awareness, communication, safe work practices, and compliance within ATAP by leading through example;
- Maintaining **familiarity** with division staff, work activities and potential hazards by frequently participating in work area walkthroughs and technical meetings;
- **Informing** the Division Director and Deputy Director for Operations of plans for technology initiatives that may require ES&H support.

Program Heads

Program Heads are responsible for establishing, implementing, and maintaining effective ES&H procedures for their Programs and ensuring correction of ES&H deficiencies on a timely basis. In addition to their general responsibilities as **Supervisors**, all Program Heads are expected to:

- Provide **leadership** and encourage participation in the ES&H activities of their Program;
- **Communicate** regularly with their Program ES&H Coordinator and **maintain awareness** of their Program ES&H performance;
- **Communicate safety information** to their Program and **receive and address safety concerns** from their Program. [ATAP expectation: incorporation of safety discussions into regular meetings with groups and supervisors.]
- Regularly **assess the safety** of their Program's workplace conditions and activities, including walkthroughs of spaces and observation of activities. [ATAP expectation: walkthrough of the Program spaces at least quarterly.]
- Consult with Division Director to recommend appropriate Project Leads and select Activity Leads for Program Projects and Activities under Work Planning and Control.
- Appoint personnel to perform ES&H duties for the Program, including;
  - Program ES&H Coordinator;
  - representatives to serve on **Focus Area Self-Assessment** teams;
  - Area Safety Leaders;
  - person(s) to perform and maintain **Electrical Equipment inventories**;
  - qualified **Shop Managers** for each mechanical and electrical shop, and ensure that the Shop Manager's name and the **shop use policy** are posted at the entrance to each shop. (Engineering Division supervisors or the EHS Shop Safety Subject Matter Expert are available to help ATAP Program Heads determine which individuals are qualified to serve as Shop Managers. Designation of Shop Managers must be approved through Work Planning and Control in a manner to be determined by Engineering Division.) Program Heads **provide resources** to Shop Managers to maintain shop tools in good mechanical and operating condition, with all required guarding in place.
- Take responsibility for the safety of non-construction work requested from subcontractors or vendors by ensuring **Subcontractor and Vendor Oversight** takes place.

Supervisors and Principal Investigators

All supervisors (including Principal Investigators, Group Leaders, and Program Heads) are responsible for ensuring that work is planned considering ES&H risks, all assigned personnel are trained in ES&H responsibilities appropriate to the tasks performed, and work is performed in accordance with all applicable ES&H recommended work practices, work authorizations, and requirements. Supervisors' general safety responsibilities are described in **ES&H Manual Section 1.7**. All supervisors are expected to:

- **Inform** their Program ES&H Coordinator of planned **changes to work scope** that modify existing hazards or introduce new hazards;
- **Review hazards and controls**, determine authorization requirements, ensure that required documentation is prepared, and ensure that authorizations are approved before beginning work. The analysis includes consideration of whether there will be circumstances when hazards remaining after controls could incapacitate a person so that he/she could not self-rescue or activate emergency services, which require documented restrictions against **working alone**;
- Under Work Planning and Control (WPC), ensure that all work performed by staff under their supervision is analyzed in Activity Manager as indicated by the guidelines in **ESH Manual Chapter 6** and that the proper authorization is obtained before beginning work.
- Under WPC, Ensure that employees under their supervision are assigned to appropriate Activities and authorized to work on those Activities at a level commensurate with the employee's competency.
- Verify that each assigned person (1) receives **on-the-job training** before being exposed to a hazard, (2) is appropriately **supervised** by a trained person until required training is completed, and (3) completes all required training for the hazards of the work before being exposed to the hazard, including any specialized training as required by **ESH Manual, Chapter 24** (see also the **Berkeley Lab Training website).** Document completion of **on-the-job training**;
- Exercise adequate ongoing **oversight** of work activities to maintain safe work conditions and practices, including **Subcontractor and Vendor Oversight**;
- Personally assess the safety of their group's workplace conditions and activities, including walkthroughs of spaces and observation of activities. [ATAP expectation: walkthrough at least quarterly]. Maintain **safe and orderly work areas**, including identifying and removing unused equipment from active work areas to designated storage areas (if there is a planned future use) or arranging for transport to Surplus;
- Ensure that findings from walkthroughs are either resolved immediately (during the walkthrough) or are entered into the **Corrective Action Tracking System** (**CATS)** database and closed in a timely manner;
- **Report safety concerns** needing Division or institutional attention to their Program ES&H Coordinator;
- Ensure that each person who uses a computer >4 hours/day completes an **Ergonomic Self-Assessment** of their workstation. Ensures that persons identified as being at high risk of ergonomic injury receive an evaluation by an Ergonomist

or Ergo Advocate, and that recommendations from evaluations are completed and the status of the evaluation is updated in the **Ergonomics database**;

- Provide a workplace safety orientation to newly assigned personnel and document that it has taken place Ensure each new person is provided with emergency contact and response telephone numbers, and is familiarized with emergency evacuation procedures;
- Evaluate employee ES&H **performance** during the annual Performance Review. Evaluate the hazard controls and **training** needs of assigned personnel by reviewing their **WPC Activities** and **Training Profiles** at least annually during the Performance Review process and whenever their job hazards are expected to change;
- Ensure that any **accidents** involving assigned personnel, whether on-site or off-site during official travel, are promptly **reported** to LBNL Health Services;
- Ensure that any **near-misses or other abnormal events** that raise safety concerns or unexpected releases of chemicals to the environment are promptly reported to the ATAP ES&H Coordinator; and
- Participate in **reviews of any accidents or occurrences** involving assigned personnel as described in **ES&H Manual Section 5.1**. Ensure **CHESS Injury/Illness Investigation Reports** are completed promptly and accurately. Identify, enter into **CATS**, and perform appropriate corrective actions.
- Enforce safe work practices in **machine shops** by assigned personnel who are qualified and approved under Work Planning and Control (in a manner to be determined by Engineering Division) to use the tools.

The home division supervisor retains ultimate responsibility for ensuring their personnel adhere to ES&H polices and to safe work practices. Supervisors and Principal Investigators are responsible for verification of the Activity Lead's assurances that work is being conducted safely and within authorizations.

AHD/JHA Work Leads

People who direct, train, and assign tasks to others under Activity Hazards Documents (AHDs) or Job Hazards Analyses (JHAs) are called "Work Leads". The AHD and JHA systems will be maintained until the work activities are fully transitioned to approved Work Planning and Control Activities (for WPC roles, see Project Leads and Activity Leads below.) Work Leads may be different than the person's Supervisor assigned in the Human Resources database. Typical examples of Work Lead roles at ATAP include **Shop Managers** overseeing people working in their shop, Principal Investigators directing matrixed technicians or collaborating researchers from other groups participating in their experiments, or an experienced Staff Scientist who is asked by the Principal Investigator to oversee continuing experimental activities while the Principal Investigator is on travel.

Work Leads have responsibility for assisting the supervisors in assuring the safety of those under their direction. Work Leads provide assurance to designated supervisors that day-to-day work, operations, and activities in their assigned area(s) and activities are conducted safely and within established work authorizations.

The responsibilities of Work Leads are as follows:

- **Maintain a safe workplace**. This includes maintaining good housekeeping to keep emergency egress routes open and reduce seismic hazards.
- **Report any deficiencies in hazard controls** to the supervisor or Principal Investigator responsible for the work. Report any facility-related problems to the Building Manager and the Work Request Center. **Inform personnel** working in the area about hazards through appropriate signage and/or instruction. **Stop work or implement additional controls** as needed to assure work can continue safely.
- Provide sufficient **observation of work activities** to assure that work is being conducted safely in accordance to work procedures and authorizations, and that controls (such as machine guards and Personnel Protective Equipment) are being used appropriately.
- Ensure each person assigned completes / updates a **Job Hazards Analysis (JHA)** as described in **ES&H Manual Chapter 32** and review it to ensure it includes the correct hazards and controls.
- **Inform the supervisors** of the workers and obtain their approval **before making any changes** in work assignments that will change the type of hazards or increase the level of hazard to which the workers may be exposed. Verify with the supervisors that the workers have completed required EHS training courses to do the work.
- Assure that workers complete **on-the-job training** in safety and emergency procedures commensurate with their work assignments and document any on-the-job training given.
- **Inform the workers' supervisor promptly of any concerns** about workers' technical competence to perform the assigned work or safety performance that arise from observing work activities. If concerns are not satisfactorily resolved, raise the concern to the next higher level of management.

- Ensure that any **safety deficiencies** identified by the Work Lead or brought to his/her attention by the work group are entered into **CATS** (with Program ES&H Coordinator assistance, if needed).
- **Know** which **work authorizations** apply to the work. Read the work authorizations and ensure the conditions are understood. **Assure that work is performed within the limits** of the work authorizations. **Report any plans to change** the types of hazards, increase the level of hazards, change hazard controls, or change personnel to the supervisor or Principal Investigator responsible for the work and ensure the changes are authorized before they are implemented.
- Consider whether there will be circumstances when hazards remaining after controls could incapacitate a person so that he/she could not self-rescue or activate emergency services. Ensure restrictions against **working alone** are documented in the appropriate work authorization(s) and ensure the restrictions are followed.
- **Assist in the transition to Work Planning and Control** by acting as a Project and/or Activity Lead, if assigned, or working with the assigned Project/Activity Leads to ensure the work hazards and controls are described in a WPC Activity.

Work Leads who are Shop Managers, see also the section on **Shop Managers.** Work Leads who are matrixed to another division, or oversee personnel from another division, see also the section on **Matrixed Personnel**.

WPC Project Leads

Work Planning and Control Project Lead responsibilities will be assigned to appropriate personnel by Program Heads, after consultation with and designation by the Division Director. The project lead may be the Supervisor, a Work Lead assigned to the position by a Supervisor, or any other staff member assigned by division management. This position is not the equivalent of a HR Supervisor or Work Lead position.

The responsibilities of WPC Project Leads are to:

- Define their WPC Projects and organize them into one or more WPC Activities;
- Assign Activity Leads to develop and oversee WPC Activities. The Project Lead may serve as the Activity Lead or assign the Activity Lead role to another person;
- Review and approve the documentation for new or revised Activities;
- Maintain overall control and responsibility for each Activity within their Project. Maintain oversight of assigned Activity Leads to ensure that all work under their Project is performed in compliance with the controls specified for that work; and
- Ensure that authorizations for work under their Project are reauthorized as required.

WPC Activity Leads

Work Planning and Control Activity Lead responsibilities will be assigned to appropriate persons by WPC Project Leads. The Activity Lead may be the Supervisor, a Work Lead assigned to the position by a Supervisor, or any other staff member assigned by their supervisor (within any LBNL and divisional requirements). This position is not the equivalent of a HR Supervisor or Work Lead position.

A WPC Activity Lead directs, trains, or oversees the work and activities of one or more people who work on their Activity. Activity Leads provide instruction on working safely and the precautions necessary to use equipment and facilities safely and effectively. The responsibilities of a WPC Activity Lead are to:

- Utilize the ISM process for each assigned Activity, including the preparation of a statement of work outlining the scope of the Activity,
- Determining the hazards associated with the work and designating the controls needed to mitigate the hazards, through use of the Activity Manager and Integrated Hazards Management systems and consultation with EHS Subject Matter Experts as needed;
- Determine the On-the-Job Training (OJT) needed to prepare staff to safely carry out the scope of work;
- Ensure that all required supplemental work authorizations (such as RWAs, Hot Work Permits, etc.) are obtained and maintained;
- Assign staff to the Activity;
- Communicate to staff the scope, hazards, and controls for the Activity, including any changes affecting the scope and safety of the Activity;
- Perform (or ensure that a knowledgeable, qualified person performs) the necessary OJT to prepare a staff member for the tasks associated with the Activity;
- Make the determination whether a staff member has established the competency to carry out the work in an Activity without direct supervision, and then formally authorize them to perform the work under the appropriate level of authorization;
- Provide oversight, guidance and supervision of the Activity; and
- Provide performance evaluation input to the Project Lead, Supervisor(s) of the assigned workers, or the worker where applicable.

Shop Managers

Shop Managers, as described in **ES&H Manual Chapter 25**, are persons approved to assist in monitoring work in ATAP shops. The Shop Manager must be a person who can, through experience, sufficient knowledge, or training, operate the equipment safely, and identify and mitigate hazards associated with the work performed in the shop. The Shop Manager:

- Completes any training required for Shop Managers;
- Has demonstrated experience in the safe operation of the equipment in the shop;
- Determines whether other personnel are competent and qualified to operate specific pieces of equipment in the shop;
- Determines who may use the equipment, and how and when they may do so (**ES&H Manual Chapter 25, Section 25.7 Work Process A, 2.a.xvi and xvii)**. This includes prohibiting people from **working alone** when hazards remaining after controls could incapacitate them so that they could not self-rescue or activate emergency services;
- Maintains records of who is qualified to use the shop (**ES&H Manual Chapter 25, 25.10 Appendix A Applications to Use Shop Equipment)** and records of On the Job Training;
- Ensures that only qualified people operate the equipment;
- Assists home and matrixed supervisors of shop users in enforcing safe use of tools and good housekeeping; and
- Removes from service, labels, and secures any equipment/tool that is damaged, in disrepair, or deemed unsafe and reports safety deficiencies to the Program ES&H Coordinator.

Note: It is anticipated that the methods of authorizing Shop Managers and shop workers will transition to the Work Planning and Control System, and that ES&H Manual Chapter 25 will be revised to reflect LBNL requirements relevant to how this process will occur under Work Planning and Control. Until these changes occur, Shop Managers should contact the Engineering Division Safety Coordinator for guidance.

Electrical Safety and Lockout/Tagout

Electrical Safety

All AFRD personnel are responsible for helping to prevent electrical shocks by practicing the following six habits, as applicable to their roles:

If you are not a Qualified Electrical Worker (QEW):

- Do not perform electrical work
- Report unsafe equipment

Qualified Electrical Workers:

- Lockout & Test Before Touch
- Establish and Control Work Space

Management (Program Heads, Supervisors, Work Leads, Project Leads, Activity Leads):

- Plan and control the work
- Correct unsafe behavior and conditions (accountability)

Division Electrical Safety Advocate(s) will be appointed by the Division Director to:

- Act as a resource to employees, managers, and the Division Safety Coordinator for electrical safety-related concerns;
- Reinforce good work practices to reduce at-risk behaviors;
- Perform routine workplace conditions inspections to look for electrical hazards in office, industrial and/or laboratory spaces;
- Perform surveys of electrical equipment and enter non-NRTL equipment into the Electrical Equipment Database for inspection;
- Coordinate with the Electrical Safety Group to resolve issues with electrical workplace conditions; and
- Be familiar with relevant resources including the Electrical Safety website, the Electrical Safety Database (QuickBase), and the Electrical Safety Manual.

During FY15, it is anticipated that new electrical safety requirements ESH Manual Chapter 8 and Electrical Safety Manual) will be developed and new responsibilities assigned. The Division Electrical Safety Advocate(s) will work with the LBNL Deputy Electrical Safety Officer and the Division Safety Coordinator to develop an Electrical Safety Plan to implement the new requirements.

Lockout/Tagout

Lockout/Tagout (LOTO) is the method of applying a mechanical lockout device and a tag on an energy isolation by a LOTO Authorized Person in accordance with established procedures in order to control hazardous energies and prevent the equipment from being operated until the lockout device is removed.

Personnel who perform LOTO, write/review LOTO procedures, or work on or near equipment where LOTO is performed will have one or more of the following roles as defined by **ES&H Manual Chapter 18**:

Affected Individuals are persons whose job requires them to be near or around the hazard zone (but not within the hazard zone) when equipment or apparatus is being maintained or serviced under a locked-out or tagged-out condition. All visiting scientists, engineers, and affiliates, including participating guests and students, who work in areas in which LOTO is utilized are considered Affected Individuals. Activity Leads must consider the roles of persons assigned to their Activity, and review the information in Activity Manager about hazards co-located with their Activity, to determine who may work in proximity to a hazard zone. Affected Individuals must complete **EHS0010 Introduction to EHS at LBNL** training (and refresher every 3 years), which contains a LOTO awareness module. The responsibilities of Affected Individuals are to:

- Follow all LOTO and safety requirements;
- Recognize when LOTO is being used, the general reasons for LOTO, and the importance of not tampering with or removing a lock and tag.

LOTO Line Managers are WPC Activity Leads responsible for equipment requiring LOTO or personnel performing LOTO. [Note: For activities that have not fully transitioned to an approved WPC Activity, the Supervisor, PI, or Work Lead must maintain the existing work authorization and fulfill the responsibilities of a LOTO Line Manager.] LOTO Line Managers must complete at least EHS0010 Introduction to EHS at LBNL training (and refresher every 3 years), which contains a LOTO awareness module. (Additional training may be required if the Line Manager also performs other LOTO roles.) The responsibilities of LOTO Line Managers are to:

- Ensure written LOTO procedures are generated and maintained where required, and that the procedures are audited at least annually;
- Prohibit employees from working on equipment requiring LOTO until the worker is trained in and authorized to perform LOTO;
- Ensure that employee LOTO authorization is assigned and documented through a work authorization including:
    - Designating specific equipment or categories of equipment to be controlled and ensure that the employee is thoroughly familiar with the equipment (within the context of his or her job function) and with the energy-control procedures;

    - Verifying that workers are qualified to perform the necessary LOTO procedures. A practical exercise may be required by the LOTO Line Manager to demonstrate proficiency;
    - Determine the appropriate levels of training required for each employee and verify that the required training has been completed.
- Ensure consistent policy implementation and reinforcing LOTO rules;
- Contact the Electrical Safety Officer and follow procedures to remove LOTO devices in case of a person's absence;
- Ensure that necessary LOTO hardware is available.

LOTO Authorized Person is someone who has completed the required training and is authorized by the LOTO Line Manager to perform LOTO on energy isolation points for the designated equipment to perform service or maintenance. LOTO Authorized Persons must complete EHS0358 LOTO for Authorized Persons (and the refresher course, EHS0258, every 3 years) as well as any procedure-specific, on-the-job training determined by the LOTO Line Manager. Only LOTO Authorized Persons shall apply locks and tags to control hazardous energy. The responsibilities of a LOTO Authorized Person are to:

- Recognize the conditions of work that require LOTO, assess all of the hazardous energy sources, use correct procedures and materials to implement LOTO;
- Maintain control over the keys to their personal LOTO locks;
- Apply his or her own personal LOTO lock and tag when performing servicing, maintenance, or modification work; and
- NEVER apply a LOTO lock for anyone else.

Subcontractor Authorized Person performs LOTO authorized under a Subcontractor Job Hazards Analysis and LOTO permit. Subcontractors performing LOTO at LBNL are required to submit their company's LOTO Program (or equivalent) to the EHS Electrical Safety Group and obtain a Subcontractor LOTO Permit. The Subcontractor LOTO Permit constitutes authorization to perform LOTO. The Subcontractor LOTO Authorized Person must have been trained by the and designated as a LOTO Authorized Person under the Subcontractor Company's LOTO Program, and must also complete LBNL EHS Subcontractor LOTO Orientation training (refresher every year). (See **ES&H Manual Chapter 18, Work Process I**).

The **Requester** who authorizes the Subcontractor JHA for the Subcontractor Authorized Person's work ensures that all outside contractors operating under the SJHA are informed of Berkeley Lab LOTO policy by verifying they have completed the LBNL EHS Subcontractor LOTO Orientation training and ensures work observations are performed to verify adherence to the Berkeley Lab LOTO policy.

Qualified Person A person designated by a LOTO Line Manager, who by reason of experience and instruction has demonstrated familiarity with the construction, installation, maintenance, and operation of the equipment, installations and the hazards involved. This employee also is required to be current with all required qualification training for his/her role in the LOTO.

Qualified Electrical Worker is a Qualified Person specifically authorized to work on Electrical systems. (For specific requirements see **ES&H Manual Chapter 8, Electrical Safety**). Qualified Electrical Workers are responsible for wearing all required PPE and following all required safe work practices while performing the necessary operations and zero-energy verification on equipment to support the LOTO process.

Person in Charge is the designated person accountable for the safe execution of the lockout. The Person in Charge must also be a Qualified Person and LOTO Authorized Person for the LOTO procedure. The people authorized to act as a Person in Charge of a LOTO procedure will be assigned through the WPC Activity or equivalent work authorization.

LOTO Responsible Individual is the designated Person in Charge of a Complex or Group LOTO procedure and is accountable for the safe execution of the procedure. The people authorized to act as a LOTO Responsible Individual for an Activity will be assigned through the WPC Activity or equivalent work authorization. LOTO Responsible Individual(s) must complete EHS070 LOTO for Authorized Persons and the additional EHS373 LOTO for Responsible Individuals training (and annual refresher). The responsibilities of the LOTO Responsible Individual are to:

- Conduct the LOTO Briefing;
- Supervise the Qualified Person(s) in the execution of the LOTO Procedure;
- Manage all changes to the scope of work; and
- Ensure all personnel performing work under the LOTO are LOTO Authorized Persons and are personally locked out for their tasks.

LOTO Coordinator is a LOTO Approver and LOTO Responsible Individual that has been assigned by the Division Director, Program Head, Project Manager, or WPC Project Lead to oversee and coordinate multiple LOTOs with a large project, such as a maintenance outage or building energization. For facility construction and maintenance projects at ATAP, Facilities Division will assign a LOTO Coordinator as needed. The responsibilities of the LOTO Coordinator are to:

- Maintain overall control of a set of LOTOs established during a large project;
- Provide overall coordination with the project schedule;
- Resolve scheduling conflicts between different LOTOs and other scheduled work; and
- Ensure the various Responsible Individuals (RIs) are properly informed of any changes that will impact their respective LOTO Procedures.

The **LOTO Evaluator and LOTO Approver** roles at ATAP are not assigned to a specific person. When the **LOTO Line Manager** informs the **ATAP Division Safety Coordinator** of a proposed new LOTO procedure, a proposed modification to an existing LOTO procedure, or a pending annual review of a LOTO procedure, the **ATAP Division Safety Coordinator** will assist the **LOTO Line Manager** in identifying an appropriate qualified person who is independent of the work activity (not anticipated to be one of the people who will be performing the procedure) who is willing to act as the **LOTO Evaluator and Approver**.

LOTO Evaluator is a person trained as a LOTO Responsible Individual, selected by the division to inspect a LOTO Procedure (see **ES&H Manual Chapter 18, Work Process P**). The responsibilities of the LOTO Evaluator are to:

- Observe the performance of the LOTO Procedure for the purpose of initial or periodic inspection;
- Verify that the LOTO Procedure is adequate, understood, and being followed by persons participating in the LOTO; and
- Document the completion of the LOTO Procedure inspection by completing a LOTO inspection report or entering the evaluation in the EHS LOTO database.

LOTO Approver is a person designated by the division to approve LOTO Procedures. They must be authorized as a LOTO Responsible Individual and have technical competence and familiarity with the equipment or systems for which the LOTO Procedure is written. They may obtain additional technical assistance as needed from Qualified Persons more familiar with the systems involved. At ATAP, the LOTO Evaluator also functions as the LOTO Approver for each procedure evaluated. The responsibilities of the LOTO Approver are to:

- Review the submitted LOTO Procedure for completeness and accuracy;
- Verify that the scope of work is clearly defined, described on the LOTO Procedure, and that the LOTO Safe Zone established in the LOTO Procedure fully encompasses the scope of work; and
- Approve the LOTO Procedure if and when it meets all requirements in **ES&H Manual Chapter 18, Work Process N**.

Chemical Owners

ATAP WPC Project Leads who authorize the use of chemicals in their Project's work **retain responsibility** for ensuring that the chemicals are properly inventoried, labeled, stored, used, and disposed. They may choose to remain Chemical Owners as described in the LBNL **Chemical Hygiene and Safety Plan** and manage the chemicals themselves as **WPC Activity Leads**, or delegate chemical management tasks **through a WPC Activity** to appropriately trained ATAP or matrixed personnel who have knowledge of the chemicals' hazards, controls, and procedures for using and storing them safely. The chemical inventory for each ATAP work area must be maintained on the **Chemical Management System**. When chemical management tasks are delegated, the ATAP WPC Project Lead must also provide the resources necessary to perform the tasks, such as funding for ordering chemicals, storage cabinets and containers, PPE, and other equipment and accessories needed to control hazards. Chemical Owners work with the EHS Industrial Hygienists, WPC Activity Leads, and Area Safety Leaders in ensuring proper Personal Protective Equipment (PPE) is available to chemical users. ATAP Chemical Owners and delegated chemical managers are expected to complete appropriate training for their role as designated on their WPC Activity for the work, which may include:

- **EHS0170 Cryogen Safety**,
- **EHS0171 Pressure Safety,**
- **EHS0344 Safe Handling of Engineered Nanoscale Particulate Matter,**
- **EHS0346 Chemical Management System Use**,
- **EHS0348 Chemical Hygiene and Safety**, and
- **EHS0604 Hazardous Waste Generator**.

Hazardous Waste Generators

Hazardous Waste Generators assist ATAP Line Management in maintaining Satellite Accumulation Areas in accordance with **PUB-3092**, *Guidelines for Generators to Meet HWHF Acceptance Requirements for Hazardous, Radioactive, and Mixed Wastes at Berkeley Lab*. Hazardous Waste Generators prepare and submit hazardous waste requisitions to EHS for waste pick-up within prescribed time limits, and communicate with the **Chemical Owners** to ensure disposed containers are removed from the inventory. Hazardous Waste Generators are expected to complete **EHS0348 Chemical Hygiene and Safety** and **EHS0604 Hazardous Waste Generator**.

Emergency Response

In the event of an emergency, personnel should take immediate steps to protect themselves and others and summon aid as described in ES&H Manual Section 5.1.1.2.

All accidents, on-site or off-site during official travel, must be reported to the supervisor and **LBNL Health Services (510-486-6266).** Personnel participate in incident reviews as requested by the incident investigator.

Personnel at the accident /incident scene are responsible for helping to **preserve the accident scene** by not moving items or initiating corrective actions prior to the investigation, except as immediately necessary to prevent further injury or render emergency assistance.

All personnel are responsible for **stopping any work activity considered an imminent danger**, defined in **RPM Stop Work Policy** as any condition or practice that could reasonably be expected to cause death or serious injury, or environmental harm.

Building Managers

Roles and responsibilities of Building Managers and Assistant Building Managers are contained in the **Building Manager Position Description** and **RPM Building Management Policy and Procedures for Facilities Coordination.** Facilities Division will maintain a Training Group in the Berkeley Lab Training database to place the required training for Building Managers on their Training Profiles.

Building Emergency Teams

Roles and responsibilities for Building Emergency Team (BET) leaders and team members are contained in the **Emergency Planning and Implementing Procedure Checklist – Building Emergency Team**. ATAP Building Emergency Teams should ensure everyone in their assigned area is familiar with basic emergency procedures and prepared to respond appropriately when there is no Building Emergency Team Member in their work area. Each ATAP Building Emergency Team Leader should ensure that their team participates in at least one hands-on exercise per year (in addition to the annual LBNL earthquake drill). Each Building Emergency Team should open and review the contents of their Rescue Box and an Emergency Trauma Kit at least annually. (The contents could be displayed to building occupants while they are waiting to reenter buildings during evacuation drills.)

Protective Services Department will maintain a Training Group in the Berkeley Lab Training database to place the required training for Building Emergency Team members on their Training Profiles. All BET personnel must receive training in:

- **First Aid Safety (EHS 116),**
- **EHS0520 Fire Extinguisher Training**, (and **EHS0531 Fire Extinguisher Safety Refresher)**,
- EHS0522 Fire Extinguisher Practical, and
- **EHS0154 Building Emergency Team**.

It is recommended (but not required) that they also receive training in:

- EHS0123 Adult CPR,
- **All-Hazards Awareness (EHS 135),** and
- EHS0155 Building Emergency Team Seminars.
- Community Emergency Response Team (CERT).

Area Safety Leaders

Area Safety Leaders coordinate with Supervisors, Managers, and WPC Activity Leads in Technical Areas to assure that the hazards and required Personal Protective Equipment (PPE) for the area are identified and communicated to all occupants through the entrance placards. The process for determining PPE requirements and food/beverage restrictions for technical areas is described in **ES&H Manual Chapter 19**. Further information and templates for entrance placards are found in the **LBNL Chemical Hygiene and Safety Plan**, under **Posting Area Entrances.** The Area Safety Leader function is particularly important when users from multiple work groups occupy or use a Technical Area.

In most cases, the Area Safety Leader will also be the person designated to authorize Facilities Division personnel to enter ATAP technical areas to perform work under the **Technical Area Work Release** process. Work Release is granted after the Area Safety Leader coordinates as necessary with Supervisors, Managers, WPC Activity Leads, and the Building Manager to determine when it is safe for Facilities personnel to enter the requested Technical Areas and what conditions must be met to ensure safety.

Matrixed Personnel and Shared Spaces

A person is considered "matrixed" if the person has a "home" division from which he/she is assigned to work in a "host" division and typically receives daily work instructions from the host division. Personnel from other divisions (primarily Engineering Division) are matrixed to ATAP, and some ATAP personnel are matrixed to other divisions. LBNL requirements are found in the **RPM Matrixed Employee Work Authorization Policy.**

In addition, some ATAP employees perform ATAP work in spaces belonging to other Divisions (APEX at ALS, Supercon in Bldg. 77/77A, and IBT in Bldg. 88) and some personnel from other Divisions may perform non-ATAP work in ATAP areas (Gould/Feinberg laser lab and EETD ventilation lab at Bldg. 71). People may perform short-term tasks for another division without being assigned a host division Matrix Supervisor, such as Facilities personnel responding to Work Requests or Engineering Division technicians working on ATAP equipment in the Bldg. 77 shop. People performing their own Division's work in shared spaces and people performing short-term tasks for other Divisions are not considered matrixed personnel. The safety of these workers remains the primary responsibility of the home division. The Building Manager of the Division owning the space is responsible for working with Facilities Division to maintain a safe workspace. WPC Activity Leads are responsible for maintaining the safety of the contents and activities within the workspaces under their control. ATAP personnel requesting work from another division are expected to inform the workers of any hazards or safety precautions associated with the work.

All personnel are responsible for stopping any work activities they observe that appear to be an imminent danger, regardless of the status of the persons performing the work. If anyone becomes aware that there may be circumstances when a matrixed person could be **working alone** and hazards remaining after controls could incapacitate him/her so that he/she could not self-rescue or activate emergency services, the work must be stopped, and the concerns brought to the immediate attention of the home and host division supervisor(s) and WPC Activity Lead(s) for resolution before work can resume.

The employee's supervisor from the home division or department retains all 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 Memorandum of Understanding (MOU). Whenever an MOU is established, it remains the responsibility of the home supervisor to assure that the MOU is appropriately implemented. [NOTE: Due to management and safety policy changes, ATAP will be establishing new formal **MOUs** with the **Engineering Division, ALS Division**, **Materials Sciences Division,** and **Nuclear Science Division** during FY15].

A Matrix (host division) Supervisor is a person responsible for providing day-to-day technical direction and oversight, including responsibilities for proper execution of ES&H activities of Employees and Affiliates within their purview. A Matrix Supervisor is required to be a Higher Education Employer-Employee Relations Act (HEERA)-designated supervisor (as determined by Human Resources) and can be in a division separate from the Employee's home division. (Persons who are not HEERA supervisors who oversee matrixed personnel are considered to be **Work Leads** or **WPC Activity Leads**). The Matrix Supervisor can also act as the host and point of contact on behalf of the division for Affiliates of LBNL. A Matrix Supervisor partners with the home division HEERA Supervisor on matters of staffing, performance review, work direction, and/or evaluation. The Matrix and home division supervisors discuss corrective actions for ES&H performance issues relative to the matrixed assignment. The Matrix Supervisor refers matrixed personnel to their home division supervisor to address issues that are not directly related to the day-to-day tasks of the matrix assignment, but is responsible for ensuring implementation of those that are related to those day-to-day tasks. The Matrix Supervisor and home division supervisor stay appropriately informed of and sensitive to personnel issues that may be covered by collective bargaining agreements.

Occurrences related to matrixed assignments are reported by the division whose operations are most affected, as determined by the host and home Division Directors. Home and host division personnel and EHS Liaisons will assist in the Occurrence investigation, reporting, and corrective actions as requested by the reporting Division Director. Further information on Occurrence Reporting is found in **ES&H Manual Chapter 15** and the **LBNL Occurrence Reporting and Processing System** website.

The home division supervisor retains primary responsibility for working with the injury/illness incident investigation team to complete the Injury/Illness Investigation Report for accidents involving their personnel who are matrixed to other divisions in accordance with the home division ISM Plan. Home and host division personnel and EHS Liaisons will assist in investigations, reporting, and corrective actions as requested by the home division ES&H Manager/ Coordinator/ Administrator. Further information on Incident Reviewing and Reporting is found in **ES&H Manual, Section 5.1**

Matrixed Engineering Division Employees

The ESH roles and responsibilities of personnel matrixed from Engineering Division to perform work under the direction of ATAP, and the roles and responsibilities of Home (Engineering Division) and Host (ATAP) Supervisors of matrixed employees will be discussed and agreed upon through the WPC Activity review and approval process on a case-by-case basis until a new Memorandum of Understanding is established.

ATAP's ALS Accelerator Physics Program

ATAP's Advanced Light Source (ALS) Accelerator Physics Program personnel are matrixed to ALS Division and are also subject to the **ALS Division ISM Plan** and ALS work authorizations. The ESH roles and responsibilities of personnel matrixed from ATAP to perform work under the direction of ALS, and the roles and responsibilities of Home (ATAP) and Host (ALS) Supervisors of matrixed employees will be discussed and agreed upon through the WPC Activity review and approval process on a case-by-case basis until a new Memorandum of Understanding is established. The ATAP ES&H Coordinator is invited to ALS Division Safety Committee meetings, and the ALS Division ES&H Coordinator is invited to ATAP ES&H Operations Committee meetings.

Work for MSD at Rutherford Backscattering Spectroscopy (RBS) System

ATAP and matrixed Engineering Division personnel work for Materials Sciences Division on the Rutherford Backscattering Spectroscopy system in 53-022. An ATAP employee is matrixed to MSD as the WPC Activity Lead and has responsibility for the day-to-day safety of the work of MSD employees and other persons working at this facility. MSD retains ownership of the equipment and work authorizations and has oversight responsibility for ensuring the safe set up and operation of the RBS system. ATAP is responsible for maintaining the safety of the building space. The ESH roles and responsibilities of personnel matrixed from ATAP to perform work under the direction of MSD, and the roles and responsibilities of Home (ATAP) and Host (MSD) Supervisors of matrixed employees will be discussed and agreed upon through the WPC Activity review and approval process on a case-by-case basis until a new Memorandum of Understanding is established.

ATAP Ion Beam Technology Work at Bldg. 88

ATAP Ion Beam Technology (IBT) Program performs work in 88-0071, also known as K-area. All work by IBT in the K-area will be conducted after safety reviews, per 88' Cyclotron standards, have been conducted and after all documentation has been included in the Safety Assessment Document (SAD) of the 88" Cyclotron. This includes any future modifications or new work of IBT Test Stands in the K-area. The ESH roles and responsibilities of ATAP personnel, including Engineering Division personnel matrixed to ATAP, working at K-area will be discussed and agreed upon through the WPC Activity review and approval process on a case-by-case basis until a new Memorandum of Understanding is established.

The authority to define the scope of Research and Development activities to be conducted in the K-area lies with the IBT Program. ATAP and IBT leadership controls which staff and affiliates can have access to the K-area (i.e. who gets badge access to the K-area) and is responsible to ensure proper training of all staff and affiliates, consistent with standard 88" Cyclotron procedures. Access of all staff and affiliates is subject to approval by the facility director of the 88" Cyclotron. It is ATAP's and IBT's intent to avoid any undue inconveniences or disruptions of 88" Cyclotron operations due to the IBT presence.

Students

Education and training of future generations is one of the University's missions and Berkeley Lab has a special responsibility to teach students to work safely. Young students do not have the skills and judgment that develop after years of professional experience. As part of their educational experience with ATAP, students should acquire an understanding and habit of planning work, analyzing hazards, obtaining authorizations, and working safely within controls. Supervisors/mentors are responsible for ensuring that students are provided a safe and healthful workplace. Students are responsible for following the direction of their supervisor/mentor and WPC Activity Lead(s). [NOTE: During the WPC transition period (November 3, 2014 – April 30, 2015), the Job Hazards Analysis process may be utilized if there is no active WPC Activity describing the work; however, transition to WPC as soon as feasible is encouraged.] As a condition of continuing their work at ATAP, students must meet the same requirements for training, work authorization, and safe work practices as employees.

WPC Activity Leads are responsible for assigning work and assigning authorization levels which provide oversight appropriate to each student's age, training, and experience level. This includes prohibiting any student from **working alone** under any circumstances when the hazards remaining after controls could incapacitate him/her so that he/she could not self-rescue or activate emergency services. All personnel (students, affiliates, or employees) under the age of 18 are restricted by law from performing certain types of hazardous work. For example, no persons under the age of 18 may operate any shop machinery or other dangerous power tools unless the work is part of a State-approved apprenticeship program. WPC Activity Leads for minors should discuss plans for work assignments with the Physical Sciences Human Resources Center personnel.

Supervisors/mentors, WPC Activity Leads, and co-workers of students must recognize their special responsibility to serve as role models because their work practices may significantly influence the behaviors students adopt. Supervisors/mentors, WPC Activity Leads, and co-workers are expected to communicate, cultivate, and enforce robust safe-work practices in students.

Work at UC Berkeley

Principal Investigators have an obligation to provide a safe workplace on campus for all LBNL-sponsored work. Lab-sponsored work on the UCB campus (exclusive of Donner and Calvin Laboratories) is to follow the ES&H policies and procedures within the "**Partnership Agreement Between UCB and LBNL Concerning Environment, Health and Safety Policy and Procedures**". 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. [NOTE: DOE requires **EHS0470 General Employee Radiation Training** for anyone listed in the LBNL Human Resources database, regardless of work location or badge status. This training is assigned through a Training Group on the Berkeley Lab Training database.]

Work Off-Site

Supervisors, Principal Investigators, and WPC Activity Leads have an obligation to be aware of the safety conditions and requirements their people (employees, students, or affiliates) may encounter while working off-site on LBNL projects. Workers working at non-LBNL facilities having local health and safety programs equivalent to LBNL's (e.g., other National Laboratories or UC Berkeley) must conform to the requirements of their host institution.

For new work and any work after April 30, 2015, Activity Leads must identify that they are work will be performed at another location by entering the LBNL **WPC Activity Manager** software system, indicating that they are working at a non-LBNL location, and agreeing to follow that location/institution's local requirements as a Hazard Control. [NOTE: DOE requires **EHS0470 General Employee Radiation Training** for anyone listed in the LBNL Human Resources database, regardless of work location or badge status. This training requirement is assigned through a Training Group in the Berkeley Lab Training database.] All LBNL people working on LBNL projects at off-site locations are required to adhere to training requirements as stipulated by the host institution or existing Memorandum of Understanding (MOU). In the absence of an MOU or host institution requirements, LBNL requirements must be completed. These requirements can be identified by a work authorization, such as a WPC Activity or equivalent system, or formal authorization. In some cases, facility or procedure-based safety training specific to the location will fulfill an LBNL training requirement.

If there are no local health and safety programs equivalent to LBNL's, workers must conform to the LBNL requirements stated in **RPM Off-Site Work Authorization Policy**, including notification to the ATAP ES&H Coordinator and EHS Liaison of the nature and scope of the project. This notification must be made as soon as possible during the proposal stages of the project. The notification must include a completed ATAP **Hazards, Equipment and Authorizations Review Form**. A hazard assessment should be performed for work other than attendance at conferences and meetings, such as laboratory, shop, industrial, or fieldwork. Where personal site visits are not practical, information can be obtained by discussions with safety and research personnel at the host site and the people who are working off-site. The ATAP ES&H Coordinator and LBNL EHS personnel may assist in the assessment of hazards and controls. Additional LBNL safety Work Authorizations may be required must be provided and approved by the appropriate LBNL safety professionals prior to initiation of the project.

ATAP expects all personnel working off-site to continue to implement Integrated Safety Management by:

- Planning and defining the scope of your work before you begin;
- Analyzing the hazards;
- Developing and implementing controls;
- Performing the work within controls; and
- Continuously assessing safety conditions, seeking feedback from safety staff, and making improvements as needed.

Hazard controls should follow safety rules (LBNL or host site, whichever is more protective), except where LBNL-equivalent requirements are prohibited or impossible to implement at the off-site location. **If you are asked to do anything you believe is unsafe or to work under unsafe conditions off-site, you have the right and obligation to stop work and contact LBNL for guidance.** If you become aware that there may be circumstances when you could be **working alone** and hazards remaining after controls could incapacitate you so that you could not self-rescue or activate emergency services, the work must be stopped and these concerns brought to the immediate attention of your host site safety personnel and LBNL supervisor and WPC Activity Lead for resolution before the work may resume. Discuss your training with off-site safety staff and ensure you have completed all required training to do the work. If the host site does not provide safety training for a work hazard, the LBNL courses for the work hazard should be completed.

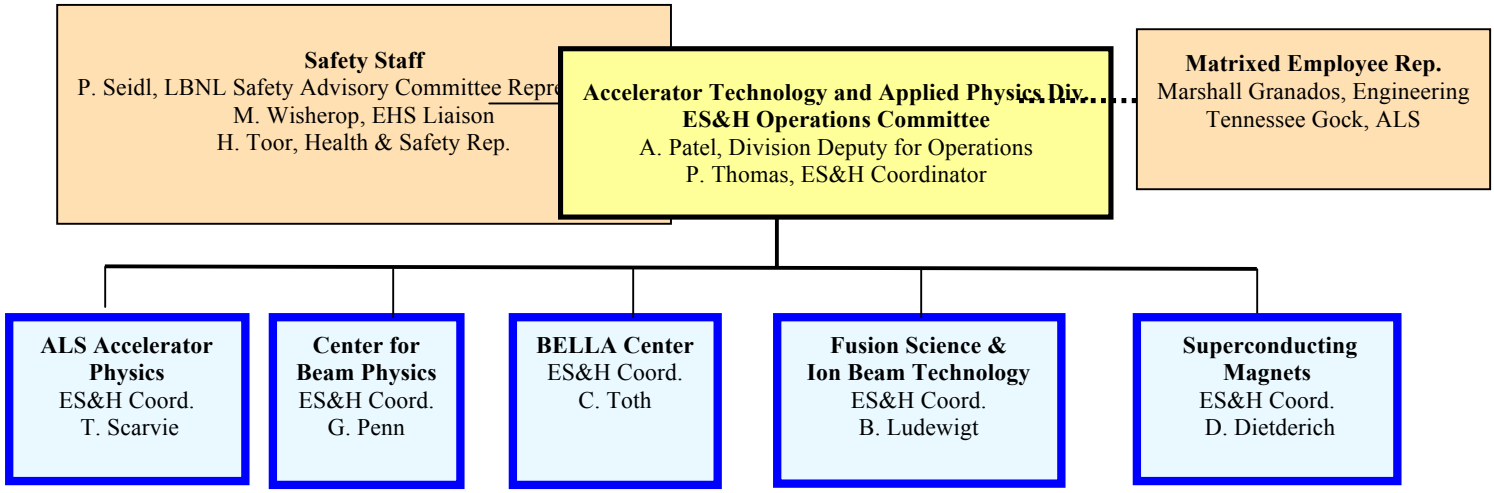
Ensure that you are familiar with the emergency response and accident reporting procedures at the host site. **If you become injured or ill during off-site work, first obtain any urgently needed first aid or medical treatment, then as soon as you can, call LBNL Health Services at 510-486-6266 to inform the Lab of your situation**.

Telecommuting

ATAP personnel may work at home or another location under a telecommuting arrangement or agreement, approved in accordance with **Requirements and Policies Manual Human Resources – Location of Work section 2.06.D.4.b**. Regular telecommuting requires a written **telecommuting agreement**. As part of preparing the written telecommuting agreement, an **ergonomic self-assessment (EHS0059)** must be completed, the required equipment must be ordered and installed, and a photo of the workspace must be taken and attached to the Telecommuting Agreement form. Telecommuters are encouraged to take advantage of EHS ergonomics support services and training as described in **ES&H Manual 17.4.4 Support Services for Off-Site/Remote Computer Users** and to contact the ATAP Ergonomics Advocates for assistance as needed.

ES&H Operations Committee

The structure and function of ATAP's safety organization is illustrated below. The ATAP ES&H Operations Committee consists of the ATAP **Division Deputy for Operations**, **ES&H Coordinator**, and **Program ES&H Coordinators**. The EHS Liaison and representatives for administrative and matrixed personnel also participate. The EHS Liaison provides technical support to ATAP operations and coordinates requests for additional EHS services. The ES&H Operations Committee discusses ES&H concerns of the programs and projects, lessons learned from them, and information on lab-wide ES&H issues. The **Safety Advisory Committee Representative** acts as a liaison between the ES&H Operations Committee and the LBNL Safety Advisory Committee.



ATAP ES&H Coordinator

The general safety responsibilities for a Division Safety Coordinator are described in **ES&H Manual Section 1.7**. The ATAP ES&H Coordinator reports to the Division Deputy for Operations and is responsible for the management, general administration, and day-to-day functioning of the ES&H program, including:

- Indicating his/her role as a Division Safety Coordinator on the **WPC Activity Manager** and completing required training;
- Serving as a **point of contact** for all division staff regarding the implementation and interpretation of the Lab's ES&H policies and serving as a conduit for feedback on how safety is being implemented (including point of contact for Lessons Learned);
- Serving as a member of the **ATAP ES&H Operations Committee**;
- Ensuring that division-specific safety **training**, if needed, is developed and implemented effectively;
- Consulting and **coordinating** with EHS (and other) resources as needed;
- **Promoting Safety Culture,** ES&H awareness, communication, safe work practices, and compliance within ATAP;
- Maintaining **familiarity** with division staff, work activities, and potential hazards;
- Serving as a member of the **Division Safety Coordinator's Subcommittee** and attending this and other meetings as necessary;
- Coordinating and managing required safety **documentation**, which includes:
    - Updating the ATAP ISM Plan and safety website;
    - Entering the findings of Division walkthrough and inspection reports into CATS;
    - Monitoring and communicating the status of safety training and Corrective Action Tracking System (CATS) corrective actions;
    - Monitoring the status and coordinating the performance of hazards reviews and work authorizations, chemical inventory, 10 CFR 851 reporting, laser inventory, and Satellite Accumulation Areas (SAAs);
- Ensuring the division has a proactive **ergonomic** safety program that minimizes injuries. Acts as an **Ergonomics Advocate**, working with EHS ergonomists to perform ergonomic evaluations and assist in resolution of action items;
- Working with the EHS Liaison and appropriate subject matter experts to assess the adequacy of hazard controls through frequent **inspections and monitoring** of work activities. Facilitating the implementation of appropriate **hazard controls** by Line Managers;
- Managing the **division self-assessment**, including: development of the ATAP Self-Assessment Plan (including the QUEST Program), coordinating completion of self-assessment reports, tracking and trending of appropriate ES&H performance indicators, ensuring Division and institutional findings are entered into CATS, and tracking and validating corrective actions;
- Serving as the division point of contact for **audits** external to the division, including EHS program reviews, LBNL management and peer reviews, DOE operational awareness and audit activities, and independent reviews;

- Monitoring the status of **building manager and emergency teams** and informing the Division Director of the need for appointments;
- **Assisting the Incident Review Program Manager in reviews** for first aid and Occupational Safety and Health Administration (OSHA) recordable injuries and other significant incidents by helping to identify associated Line Management and scheduling review activities as requested. Supporting the supervisor in the review process by facilitating interviews, advising the Supervisor on the review findings and use of the **CHESS Injury/Illness Incident Investigation module**, and facilitating development and closure of appropriate Corrective Actions, as described in **ES&H Manual Section 5.1**;
- Serving as a division point of contact for **Occurrence Reporting**, assisting in the notification, recommended categorization, investigation, mitigation, and report preparation of all reportable occurrences within the division, as described in **ES&H Manual Chapter 15**;
- Communicating status of key safety performance measures and results of audits, assessments, and incident investigations to ATAP management (Division Director, Division Deputies, Program Heads, and Program ES&H Coordinators) and recommending actions to improve performance; and
- Serving as the Division **Space Coordinator**. This combination of duties provides additional opportunities for participation in the work planning process, to work with the ATAP Deputy for Operations to ensure facilities provided are appropriate to the work to be performed in the space. Space coordination activities require the ES&H Coordinator to visit work areas frequently, providing opportunities to observe work in progress and assist in identifying potential hazards.

Program ES&H Coordinators

Each Program Head appoints one or more Program ES&H Coordinators. In most Programs, this position is a part-time responsibility for a senior researcher or engineer. Program ES&H Coordinators are expected to:

- Participate in **ATAP ES&H Operations Committee** activities;
- Inform the Committee of **planned activities** in their Program and assist in **hazard review** and **work authorization** activities;
- **Organize QUEST** teams and **report findings** to the Committee;
- **Report** any accidents, occurrences, hazardous conditions, or concerns that require action and report completion of action items; and
- Maintain **awareness** of their Program ES&H performance, including **Safety Training** completion, **CATS** completion, and work authorization status. **Communicate** relevant ES&H information to their Program Head, Principal Investigators, and other affected personnel.
- Work with their Program Head to **encourage improvement** in their Program's ES&H performance.

Safety Advisory Committee Representative

The Division Director nominates an ATAP researcher who can effectively represent the Division to the Laboratory Director for appointment to the **Safety Advisory Committee** (SAC). There are no specific qualifications for SAC members in terms of their position, experience, and training at the Laboratory. The SAC Representative is expected to:

- Possess an understanding of Integrated Safety Management.
- Communicate regularly with senior division management and other division personnel as needed.
- Possess communication skills to comment on, make suggestions or recommendations for, revise, advise senior management on, and influence the Laboratory's approaches, methods, documents, and practices to continuously improve the Laboratory's safety programs.
- Develop an understanding of the LBNL ES&H Manual and related documents, and the processes for revising these documents.
- Participate actively in SAC meetings, subcommittees, and peer review activities.

Integrated Work Planning

Integrated Safety Management tells us to plan work, analyze the hazards, ensure controls are in place, and obtain authorization before starting work. There are systems in place to help you do these things. Before starting a new project, the first step is to think about what will be needed to get the job done:

- **Project scope and schedule** Define what you are trying to accomplish and when it needs to be done.
- **People** How many people and what types of skills will be needed? Do you already have the right people in your work group? **Human Resources** and ATAP management can help you find the right people. There may be people in other ATAP programs who can help. ATAP often partners with other Divisions (Advanced Light Source, Engineering, Materials Sciences, Environmental Energy Technologies, etc.) for special expertise. Everyone will need to check their **Training Profiles** to see whether they have the required training.
- **Equipment and materials** What do you need to accomplish your task? Is the equipment commercially available, or will it need to be designed and fabricated? How long will it take to obtain and set up the equipment or materials? **Engineering** Division assistance is often needed to help us answer questions about design and fabrication. **Procurement** professionals can help find the right supplier or vendor and negotiate costs. Involving **EHS Subject Matter Experts** early in the decision process can help avoid delays and modifications. Increases in the quantity or hazard of chemicals can sometimes trigger emergency planning requirements. Our **Property Coordinator** (**Martha Condon**) will help you inventory and keep track of your new equipment. New electrical equipment may require inspection before it can be used.
- **Space** What size and type of space (lab, shop, office) will you need to perform the work? What types of utilities (electrical power, water, ventilation, lighting, etc.) will be needed? If you don't have the right space immediately available, contact a space coordinator (**Pat Thomas** or **Martha Condon**) for help as soon as possible. It can take time to find the right space. The space coordinators can tell you whether the space is available or has been promised to someone else. The available space may require modification to make it suitable for your use. The **Building Manager** will also be involved in the planning process.
- **Modifications** Small modifications such as cleaning or painting a space, or adding a 120 V electrical outlet, can be accomplished by contacting the **Facilities Work Request Center** and providing an account number. Structural modifications will require Facilities Division support through the Small or Large Projects group. Facilities will assign Project and Construction Managers to work with you to see your construction project through from design to completion.

- **Funding** Do you have enough funding to do everything you will need to do? ATAP Program and Division management can help you identify and apply for funding. The **financial professionals** assigned to ATAP from the Office of the CFO can help you develop a budget and track your expenses through **F$M**.

Integrating Safety into Work Planning

For new experiments or work processes, your Program Safety Coordinator and Division Safety People can help you identify the hazards associated and the controls needed. The **Hazards, Equipment, and Authorization Review Form** is an optional tool to help you think through the hazards analysis process. ATAP's EHS Liaison and EHS Subject Matter Experts will help you identify the work authorizations and hazard controls needed. **The WPC Activity Manager** is the primary tool used to identify the hazards and controls for your work. [NOTE: During the WPC transition period (November 3, 2014 – April 30, 2015), the Job Hazards Analysis process may be utilized if there is no active WPC Activity describing your work; however, transition to WPC as soon as feasible is encouraged.] If your work assignment or hazard controls change, the WPC system will send you a notification that you need to review and accept the new hazard controls.

Some types of work activity hazards may require EHS evaluation or special authorizations in addition to WPC Activities. These requirements will not be changed by the transition to Work Planning and Control. The WPC Activities will reference or attach the additional analyses, controls, or authorizations

Be prepared to demonstrate that the controls are in place before your work authorizations are approved. Some authorizations will require on-site reviews. The analysis and review will include consideration of whether there will be circumstances when hazards remaining after controls could incapacitate a person so that he/she could not self-rescue or activate emergency services, which would require documented restrictions in the work authorization(s) against working alone.

Transition to Work Planning and Control

Work Planning and Control (WPC) Activity Manager or JHA processes apply to all LBNL staff and affiliates working at Berkeley Lab, a LBNL managed facility, or a remote field location. Individuals working for subcontractor vendors, service vendors, and construction contractors may be authorized to conduct work under alternate processes (the Subcontractor JHA and the Construction JHA Programs, respectively).

During the period of November 3, 2014 – April 30, 2015, ATAP work authorizations will be transitioning from Job Hazards Analyses (JHAs), Task-Based JHAs, and Activity Hazards Documents (AHDs) to Work Planning and Control (WPC) Projects and Activities. [NOTE: Projects and Activities under WPC are not the same as under the Financial System Manager (F$M)] The steps toward the ATAP transition are anticipated to include:

- **October – November 2014** – Division Director and Program Heads select initial Project Leads and Activity Leads. EHS Liaison and Division Safety Coordinator met with initial Project Leads and Activity Leads to provide information and launch draft Projects and Activities.
- **December 2014** – Activity Leads continue to work on drafting Activities. The Activities for NDCX-II are completed, reviewed, and authorized.
- **January 2015** – Activities for work covered by AHDs and/or RWAs will be completed and submitted for review.
- **February 2015** – Activities for work covered by AHDs and/or RWAs are reviewed and authorized. Workers read and accept work assignments and hazard controls.
- **March 2015** – Activities for remaining work are completed, reviewed, and authorized. ATAP Division Safety Coordinator meets with DSCs of Divisions with matrixing/space sharing relationships (Engineering, ALS, MSD, NSD, EETD) to check for any gaps in work authorizations. Division Safety Coordinator meets with ATAP Supervisors to review JHAs of ATAP personnel to determine whether all work has been described and authorized by WPC Activities. Division Safety Coordinator will request EHS termination of JHAs that have been fully replaced by WPC Activities. Where gaps in authorizations are discovered, JHAs will remain active until work assignments are adjusted or new Activities are created to fully cover the work.
- **April 2015** – Any pending Activity reviews for existing work are completed and all remaining AHDs and JHAs are terminated.

Before drafting or updating a work authorization, ATAP personnel should talk to their supervisors and ask which system to use. If Activities have been created within Activity Manager that cover the scope of the work, it will be authorized through Activity Manager. If not, the work will be authorized by a JHA, Task-Based JHA or AHD until appropriate Activities in Activity Manager are created. **Existing work authorizations must be maintained until the work is fully authorized under an approved WPC Activity.**

Work Planning and Control Process

When planning a new experiment or project, the first step is to contact the ATAP ES&H Coordinator to assist in determining what type of work authorization is needed. Most work is authorized through **WPC Activities**, as described in **ES&H Manual, Chapter 6,** that are required for most LBNL work. The Activity Lead enters information describing the work and hazards, and WPC Activity Manager categorizes the hazard level of activities as low (1), medium (2), or high (3).

Developing WPC Projects and Activities

The process of writing and obtaining approvals for a new Activities can typically take several weeks. Activities are written and signed electronically on the **WPC Activity Manager database**. An Activity consists of a description of the work, descriptions of the hazards and controls, a list of assigned personnel and their authorizations levels, and the required approvals. Supporting documents such as procedures, diagrams, hazard analyses, and other work authorizations may be uploaded.

WPC Activity Review Process

When a draft WPC Activity is ready for review, the Activity Lead releases it electronically for review. The EHS Review Leader (the EHS Liaison) sends invitations to relevant EHS Subject Matter Experts to participate in the review.

Initially, until ATAP Activity Leads have demonstrated proficiency using the WPC Activity Manager system, WPC Hazard Level 2 Activities will require approval by the ATAP ESH Coordinator.

ATAP requires an on-site review for approval of WPC Activities with Level 3 Hazards. ATAP may draw upon the expertise of matrixed personnel to strengthen our internal review process. The ATAP ES&H Coordinator may request that a Division Deputy, or, with approval of their Program Head, one or more staff or senior scientists and/or senior mechanical or electrical technicians external to the process being reviewed, but with appropriate experience in working with similar processes and hazards, serve as peer reviewers for a Hazard Level 3 WPC Activity. The ES&H Coordinator will lead the internal review, and may choose peer reviewers to assist. The reviewers will read the draft Activity, be invited to attend an on-site review, and report their recommendations to the ES&H Coordinator. The **Activity Review Form** is used to guide the on-site review. The review will include consideration of whether there will be circumstances when hazards remaining after controls could incapacitate a person so that he/she could not self-rescue or activate emergency services, which would require documented restrictions against **working alone**. The ES&H Coordinator may electronically sign the Activity or elect to bring further issues to the attention of the Activity Lead and EHS Review Leader for resolution before the Activity is recommended for approval by the Division Director. Hazard Level 3 Activities must be signed electronically by the review team and Division Director before it becomes final.

Supervisors of personnel assigned to Hazard Level 3 Activities must approve their work authorization, and authorized personnel must read and electronically sign the Activity before they begin working on the experiment.

WPC Activities are renewed at least annually, or whenever there are plans for significant modifications that will affect the scope of work, hazards, or controls.

Other Safety Evaluations and Work Authorizations

Some types of work activity hazards may require EHS evaluation or special authorizations. These requirements will not be changed by the transition to Work Planning and Control. The WPC Activities will reference or attach the additional analyses, controls, or authorizations, which may include:

- **Chemical Hazard** industrial hygiene evaluations for work involving toxic or flammable gasses, class 3b or 4 lasers, cryogens with the potential to cause oxygen deficiencies.
- **Electrical Work** involving exposure to >50V and 5 mAmps may require a Qualified Electrical Worker with specialized equipment and training. Work requiring **Lockout/Tagout** requires special training. If two or more sources of energy must be locked out, there must be an approved LOTO procedure for the equipment. Contact the Electrical Safety Subject Matter Expert for further information about work authorization requirements.
- **Radiation Safety** The Radiation Protection Group provides several types of **Radiological Work Authorization (RWA)** for work with radioactive materials or sources of prompt radiation. If you plan to work with radioactive materials or equipment that may produce radiation, contact the **Health Physicist** assigned to your building to find out what type of authorization you need.
- **Hot Work Permits** are issued by the LBNL Fire Marshall's office for work with sources of ignition.
- **Penetration Permits** are issued by Facilities Division for work that requires penetrating a structural surface (wall, floor, ceiling) or ground where there may be hidden utilities.
- **Subcontractor Job Hazards Analyses (SJHAs)** are required when non-LBNL vendors or service providers will provide hands-on work at LBNL, such as setting up or testing equipment.

Subcontractor and Vendor Oversight

Program Heads and supervisors (including Principal Investigators) take responsibility for the safety of non-construction work requested from subcontractors or vendors by:

1. Working with Procurement to assure that qualified service suppliers are selected;
2. Ensuring hazards are identified through a **Subcontractor Job Hazards Analysis and Work Authorization (SJHAWA)** and controlled;
3. Ensuring that a pre-job safety meeting is conducted, which includes a review and signing of the SJHAWA, an **ES&H Orientation for Non-Construction Subcontractors, Vendors, and Affiliates**, and verification that the workers have completed EHS0470 General Employee Radiation Training;
4. Verifying that the work is authorized as described in **ES&H Manual Chapter 31**; and
5. Providing sufficient oversight to ensure that on-site work is performed safely in compliance with LBNL EHS requirements. Records of the signed Subcontractor Job Hazards Analyses and related work authorization documents are maintained on the **Subcontractor Job Hazards Analysis and Work Authorization database**.

Subcontractor / Vendor Job Hazards Analysis

Before Hands-On Work (See **ES&H Manual Chapter 31, Section 31.6** for examples) can be performed by Subcontractors or Vendors at LBNL facilities, the work must be authorized. If the subcontractor / vendor has performed similar work at LBNL and has an existing work authorization, the ATAP Line Manager requesting the work must review the existing authorization and verify that it covers the requested work. If a new or modified work authorization is needed, following activities must be completed:

- A draft **Subcontractor Job Hazards Analysis (SJHA)** and any additional draft formal work authorizations required (such as a temporary laser work authorization, electrical work authorization, hot work permit, etc.] describing the work, hazards, and controls must be completed.
- The subcontractor or vendor must be provided with the **LBNL ES&H Orientation for Non-Construction Subcontractors, Vendors, and Affiliates** for review.
- A pre-job meeting between the ATAP Line Manager requesting the work, the ATAP ES&H Coordinator or EHS Liaison, and the subcontractor or vendor must occur at which the SJHA, other formal work authorizations, and the Non-Construction Safety Orientation are discussed and the hazard level for the work is determined. Completion of EHS0470 General Employee Radiation Training (GERT) is verified. **If a subcontractor or vendor will be performing work with Class 3B or 4 lasers, a laser safety orientation by the Laser Safety Officer or Division Safety Coordinator is required**.
- The review will include consideration of whether there will be circumstances when hazards remaining after controls could incapacitate a person so that he/she could not self-rescue or activate emergency services, which would require documented restrictions against **working alone**.

- The work authorizations are completed and signed by the ATAP Line Manager requesting the work and the subcontractor or vendor and are posted or available on-line at or near the work location.

During the conduct of the hands-on work performed by the subcontractor or vendor, the ATAP Line Manager who requested the work must provide oversight and keep records of visits to the work site and observations. Low-level hazard work (not requiring formal authorization) oversight is comparable to the oversight of similar activities performed by LBNL employees. High-level hazard work (requiring formal authorization) must be checked at a minimum frequency of once per workday, or more frequently if required by work authorizations. Work that is not performed in conformance with the authorization should be corrected on the spot. Significant or multiple non-conformances may be cause for dismissal of the contractor/vendor and should be brought to the attention of the EHS Non-Construction Safety Assurance Program Manager and appropriate Procurement personnel.

Construction work must be authorized by LBNL Facilities Division. The safety and health of construction subcontractor employees is the responsibility of the construction subcontractor (**ES&H Manual Chapter 10**). ATAP personnel who notice imminent hazards on construction projects in ATAP areas should exercise Stop Work authority. Other safety concerns at construction sites should be brought to the attention of the Facilities Project or Construction Manager, or an EHS Construction Safety subject matter expert.

ATAP Hazards, Equipment, and Authorizations Review Form

1. Location Information:

Building: _____ Room: _____ Date Reviewed: _____

Reviewers_____

2. Project Information

ATAP Program _____

WPC Project_____ WPC Project Lead _____

WPC Activity_____ WPC Activity Lead _____

Area Safety Lead _____

Other Assigned Personnel_____

Description/ Notes:

_____

_____

3. Summary:

This experiment/operation requires:

__ Authorization through WPC Activities.
__ Other **Formal authorizations** as listed below.
__ Inclusion of chemicals in Chemical Management System __ Inclusion of hazards in Hazards Management System. __ Inclusion of lasers in Laser Inventory.
__ Inform Area Safety Lead for inclusion of hazards and controls on door placards.

4. Hazard Information

Hazard	Formal Authorization	Comments
__**Biohazards** – pathogenic/opportunistic organisms, recombinant DNA, cell cultures, human blood or body fluids; human or animal subjects	Contact EHS for further guidance.	
__**Chemicals** – **Health Hazard** toxic, carcinogenic, reproductive toxin, sensitizer, corrosive __**Physical Hazard** reactive (e.g. alkali metals, peroxide formers, explosives), pyrophoric __**Oil Spill** any equipment containing ≥ 42 gallons of oil	__**Hazard Evaluation** required for reactive; pyrophoric; chemicals possessing lethal or incapacitating toxicity, whenever glovebox is required for safety, or whenever failure of other primary engineering controls would result in a significant exposure or safety hazard __**Risk Assessment** for quantities that could pose a human health or environmental risk if released. __ **SPCC Plan** inclusion in LBNL SPCC Plan for equipment containing ≥ 55 gal. oil	May require Hazard Evaluation by Industrial Hygiene. Notify EHS Environmental Services of any equipment containing > 42 gallons of oil; secondary containment is required. Increase in quantity or hazard may impact categorization of building and emergency planning.
__**Compressed Gas** __ **Inert** pressure and/or oxygen displacement ___ **Physical Hazard** flammable, pyrophoric, reactive __**Health Hazard** toxic, carcinogenic, reproductive toxin, sensitizer, corrosive	__**Engineering Safety Note** and/or __**Hazard Evaluation** required for: • Any pressure system with >75,000 lb-feet stored energy, (not including cylinders); • Flammable >2 full size cylinders (400 cu. ft.) per room; • any pyrophoric, reactive or health hazard gases; or • any potential oxygen deficiency	May require Hazard Evaluation by Industrial Hygiene. Increase in quantity or hazard may impact categorization of building and emergency planning.
__**Confined Space**	__**Confined Space Permit** required for Administrative or Permit-Required Confined Space	See also **Working Alone** below.
__**Cryogens** ___ **Mobile** usage __**Installed** system	__**Hazard Evaluation** required for stored energy greater than 75,000 ft-lb or where there is a possibility of asphyxiation (e.g., confined or unventilated space)	May require Oxygen Deficiency Hazard evaluation by Industrial Hygiene. Increase in quantity or hazard may impact categorization of building and emergency planning.

Hazard	Formal Authorization	Comments
__ **Digging or Surface Penetration**	__**Penetration Permit** required for any penetration of concrete, or other surfaces > 1 1/2”	See HMS for legacy radiation information.
__**Electrical** __exposure to ≥50V and ≥5mA __ **high voltage / high energy** -- >100V or 10kW __**repair, assembly, testing** __ work requiring LOTO __non-NRTL equipment	To be determined in consultation with EHS Liaison and Electrical Safety Subject Matter Expert. __**Approved LOTO procedure** is required for LOTO of 2 or more sources of energy.	Evaluation required for non-NRTL equipment. Electrical work requires authorization from the employee’s supervisor (see **Health & Safety Manual, Section 8.8.2).** See also **Working Alone** below.
__**Environmental releases**-- - __air emissions __wastewater treatment or discharge __spill capable of causing damage or permit violation	Depends upon specific permit; contact EHS Environmental Services group for assessment.	Notify EHS Environmental Services of all equipment containing ≥ 42 gallons of oil.
__**Ergonomic issues** - __lab/industrial __ computer workstation		Recommend contacting EHS Ergonomist for evaluation.
__**Lasers** __ Class 1,2, 3a __ Class 3b or 4	__**LSO Evaluation** required for Class 3b or 4	Laser eye exam and training required.
__**Lead** __Shielding __>5 Bricks		See Ionizing Radiation below.
__**Machine Tools** __ machine shop __ lab equipment		Authorization from Shop Manager and PI/Work Lead. See also **Working Alone** below.
__**Material Handling** __manual lift > 50 lbs or repetitive __ forklift/industrial truck __ crane/hoist	__**Critical Lift Procedure** required for high value/consequence lifts __**Engineering Safety Note** required for custom-built or modified lifting fixtures	Training/certification required for crane or industrial truck operation
__**Non-Ionizing Radiation** > background outside enclosure ___ infrared __ ultraviolet __ RF & Sub-RF __ microwaves		Contact Subject Matter Expert for evaluation.

Hazard	Formal Authorization	Comments
__**Non-Ionizing Radiation** -- **Magnetic Fields** > 5 Gauss outside enclosure		Contact Subject Matter Expert for evaluation. 5 Gauss field area must be marked.
__**Pressure** >150 psi (not including gas cylinders) or 1500 psig (liquid) or large volume __non-commercial or modified pressure vessel	__**Engineering Safety Note** and ___**EHS Evaluation** required for • Non-commercial or modified pressure vessel; • Stored energy greater than 75,000 ft-lb (not including gas cylinders); • Pressure >150 psig (gas) or 1500 psig (liquid);	Radioactive contents: see Ionizing Radiation below.
__**Radiation – Prompt Ionizing**	__**Radiological Work Authorization** or __**X-Ray Authorization** or __**Low Dose Machine Authorization** may be required (contact Health Physicist). __**Safety Analysis Document** and **Accelerator Readiness Review** may be required for Accelerators (contact DOE representative)	Contact EHS Radiation Safety for evaluation of all radiation-producing equipment and documentation of accelerator / non-accelerator status determination.
__**Radiation – Ionizing Isotope**	__**Radiological Work Authorization** or __**Radiological Work Permit** required for any amount	Increase in quantity or hazard may impact categorization of building and emergency planning.
__**Radiation – Ionizing Sealed Source**	__**Sealed Source Authorization** required for all amounts	Increase in quantity or hazard may impact categorization of building and emergency planning.
__**Subcontractors** performing hands-on work	__**Subcontractor JHA**	
__**Thermal joining or cutting** – welding, soldering, silver soldering, brazing	__ **Hot Work/Open Flame Permit** (Fire Department) required for open flame or arc	
__**Thermal** - e.g., oven, furnace, heat tape		
__**Vacuum**—stored energy > 75,000 ft.-lb.	__ **Engineering Safety Note** __ **EHS Hazard Evaluation**	

Hazard	Formal Authorization	Comments
__**Waste** – hazardous, mixed or radioactive; medical/bio hazard waste	__**Satellite Accumulation Area** required for <55 gallons; __**Waste Accumulation Area** required for >55 gallons	
__**Working alone** – hazards that remain after controls could incapacitate a person so that he/she cannot self-rescue or activate emergency services	Document restrictions in WPC Activity work authorization	
__Other Hazards	Contact EHS Liaison	

5. *Equipment Information*

Equipment	Comments
__**Autoclave**	
__**Approved Storage Cabinet** (flammables, toxic gas, biohazard)	
__**Clean Room** (portable)	
__**Crane, Hoist** (not maintained by Facilities)	
__**Ultracentrifuge**	
Other	

6. *Environmental Performance*

Environmental Performance	Comments
Waste Reduction	
Emissions Reduction	
Resource Conservation	

Hazard Level 3 Activity On-Site Review

WPC Actvity #_____ Title:_____

Activity Lead_____

Expiration date_____

Review date_____

Review participants:

Review criteria		**Comments**
Work description hazard, controls descriptions up-to-date?		
Personnel list up-to-date and assignments appropriate?		
EHS training complete?		
OJT documented?		
Appropriate employee authorization levels?		
All hazards selected?		
Controls selected/specified?		
LOTO procedure current and available?		
INTERLOCKS		
Test procedure?		
Test schedule?		
Recent test completed? Date?		
Non-NRTL electrical equipment? Surveyed & passed inspection?		
RWA up-to-date and available?		
Safety Issues:		
Environmental Performance		
Waste reduction		
Emission reduction		
Resource conservation		

Funding of ES&H Requirements

Principal Investigators must incorporate appropriate resource allocation for ES&H concerns in all research proposals, including the cost of safety equipment, permits, training, maintenance, waste disposal, and facilities modifications, unless covered by institutional funding sources.

ATAP Resources

To facilitate implementation and execution of the Division ES&H Program, the following Division resources are made available:

Time	Function	Description
0.2	Division Deputy for Operations	Approximately 1 day per month: • supervising the ES&H Coordinator, • participating in the ES&H Operations Commit • coordinating safety policy with Division Management
1.0	Division ES&H Coordinator	Includes: • approximately 1 day per month in support of Safety Advisory Committee, • 2 days per month on average on building management and space coordination
0.2	Safety Advisory Committee Representative	Approximately 1 day per month performing duties as Chair of the LBNL Safety Advisory Committee
0.1	Ergo Advocates	2 people perform ergo evaluations and provide info

The following Division resources are needed for Electrical Safety:

Time	Function	Description
2hrs/mo	LOTO Procedure Reviews	Performed by matrixed Qualified Electrical Workers
TBD	Electrical Safety Advocate(s)	Responsibilities and level of effort to be determined by new electrical safety requirements. Preliminary duties include: • Act as a resource to employees, managers, and the Division Safety Coordinator for electrical safety-related concerns; • Reinforce good work practices to reduce at-risk behaviors; • Perform routine workplace conditions inspections to look for electrical hazards in office, industrial and/or laboratory spaces; • Perform surveys of electrical equipment and enter non-NRTL equipment into the Electrical Equipment Database for inspection; • Coordinate with the Electrical Safety Group to resolve issues with electrical workplace conditions; and • Be familiar with relevant resources including the Electrical Safety website, the Electrical Safety Database (QuickBase), and the Electrical Safety Manual; • Assist in developing Division Electrical Safety Plan.

ES&H efforts are an integral part of all ATAP activities and are performed by all ATAP personnel as needed and appropriate to the job task. The estimated level of effort is anticipated to include, but is not limited to:

$\geq$ 4 hr/Program /month Program ES&H Coordinator duties
$\leq$ 1.5 hr/employee/month QUEST self-assessment team

Estimated ES&H Support of ATAP
From the EHS Division

ATAP will require support from EHS Division professionals on an as-needed basis. EHS estimates that direct support activities may require a level of effort of approximately 0.50 FTE, as described below. ATAP also expects to receive EHS general programmatic support as described in the ES&H Manual, including, but not limited to, training courses.

Function	**FTE**
Division Liaison Function	
Liaison – WPC Activity Reviews	.05
Liaison -- Inspections (SA, etc.)	.10
Liaison -- Consultations, meetings, etc.	.05
	.20
Other EHS Support	
Electrical safety	.02
[NOTE: new requirements may increase level of effort]	
IH/H&S representative assistance (includes chemical issues, respirators, lead, noise, confined space, air quality, and other project support)	.10
Emergency coordination and management	.03
Accident/Incident investigation and ORPS	.03
Radiation and laser safety	.05
Waste -- Training, consultations	.05
Ergonomics	.02
	.30
Total	**.50**

Note: EHS support of ALS is included in the ALS Division ISM Plan.

ATAP Self-Assessment Systems

Introduction to ATAP Self-Assessment Systems

The Laboratory has implemented a self-assessment system that ATAP fully supports and in which the Division actively participates. This system includes the following assessments:

- ES&H Peer Reviews, conducted by the LBNL Safety Advisory Committee, review how well the management systems described in our ATAP Integrated Safety Management Plan are functioning.
- EHS Division's Technical Assurance Program consists of subject matter experts' self-assessments the performance of their programs.
- Contract 31, Appendix B self-assessments utilize information from the ES&H self-assessments described above and assessments of business and operational functions to measure LBNL's performance against contract performance measures.

Division Self-Assessments are another important element of this system. The Accelerator Technology and Applied Physics Division (ATAP) self-assessments will evaluate hazard controls (e.g. administrative, engineering, etc.), aspects of Safety Culture, and compliance with institutional and divisional requirements to determine if the programs and/or processes are effective, adequately implemented, and are fostering improvement.

ATAP uses a tailored, risk-based approach to assessing safety program effectiveness. ATAP management identifies the hazards and aspects of Safety Culture having the greatest potential impact on the safety of employees, protection of environment, and/or continuity of operations.

ATAP's division self-assessment program consists of two key elements: **Focus Area Self-Assessments** and **QUEST**. QUEST raises safety awareness, involves everyone in the Division in improving safety, and encourages teamwork and communication. Additional on-going assurance activities include quarterly ES&H Coordinator/EHS Liaison walkthroughs, ATAP management and supervisor walkthroughs, Hazardous Waste Generator Assistance walks, Lockout/Tagout procedure reviews, Work Planning and Control Activity reviews, and ergonomics assessments.

In February 2015, there will be a special series of **Electrical Work Discussions** for ATAP Programs to provide feedback to Division management on the types of electrical work they do, whether the work might require a Qualified Electrical Worker (QEW), and how the need for QEW support might be met. An **Electrical Work Discussion Guide** will be used by the Division Safety Coordinator to organize the discussions. A summary of the results of the discussion will be presented to ATAP management, the Safety Advisory Committee, and the Electrical Safety Subcommittee.

Focus Area Self-Assessments

The ATAP Division Director, Program Heads and ES&H Operations Committee identify hazards and aspects of Safety Culture having the greatest potential impact on the safety of employees, protection of environment, and/or continuity of operations. The division ES&H self-assessment process and associated work products are "owned" by ATAP and are an integral part of our Integrated Safety Management process. See **Focus Area Self-Assessments** for a description of ATAP's focus areas, methodologies, and evaluation frequencies. ATAP's self-assessment will address safety programs and hazards of importance to ATAP and, in the process, will identify findings, observations, and noteworthy practices.

QUEST

ATAP developed and implemented an internal self-assessment process called **QUEST**: **QU**ality assurance/improvement and **E**nvironment, safety and health through **S**elf-assessment and **T**eamwork. Its basic premise is that teams composed of employees actually performing the work of the Programs are in the best position to evaluate the quality and safety of our workplaces. See **QUEST** for a description of the participation requirements, scope, assessment methodologies and tools, and schedule for the activities for this year. QUEST activities planned for FY 2015 include a broad-based assessment of safety hazards and environmental management practices in ATAP workplaces in February 2015.

ATAP Focus Area Self-Assessments

Selection of 2015 Focus Areas

ATAP identified two Focus Areas that will be evaluated as part of the ES&H Self-Assessment process for Fiscal Year 2015 (FY15):

Focus Area 1. Lockout/Tagout

This Focus Area was recommended by the ATAP ES&H Operations Committee and approved by the Division Director because of potential impact on safety of personnel and to evaluate compliance with requirements. The LBNL Lockout-Tagout Program was revised in October 2013. Division and matrixed personnel often have the need to enter areas where the potential for exposure to high voltage exists to adjust experimental equipment, or to service or repair equipment or machinery that could cause injury if inadvertently powered up during servicing or repair. In these situations, equipment or machinery are de-energized and locked out under lockout-tagout (LOTO) procedures. This assessment will focus on LOTO performed by Division and matrixed personnel. ATAP has seven active equipment-specific LOTO Procedures and four new procedures under development or review. LOTO is most closely associated with the 3rd Core Function of ISM, development and implementation of hazard controls.

This important area of LBNL safety has not been the subject of a thorough assessment. A search of the Lessons Learned/Best Practices Database reveals only one LBNL Lesson, LL-12-0027 *Failure to perform start test resulted in improper lockout of a low-voltage power circuit breaker.* A review of other Division self-assessment reports for FY10-14 reveals one self-assessment by Computing Sciences focused on LOTO. ATAP has not performed any previous Focus Area Self-Assessments related to LOTO.

EHS Division and several other Divisions are planning to conduct Focus Area Self-Assessments of LOTO this year. We anticipate the opportunity to coordinate our efforts to take a site-wide look at some common Lines of Inquiry to develop institutional findings, recommendations, and corrective actions.

Focus Area 2. Work Planning and Control

This Focus Area was recommended by the ATAP ES&H Operations Committee and approved by the Division Director because of potential impact on health of personnel and safety culture. Is most closely associated with the1st Core Function of ISM, planning work.

LBNL has been developing a new work planning and control system to describe work, identify hazards, identify controls appropriate to those hazards, and authorize workers. This system (WPC Activity Manager) is scheduled to launch in November of 2014. WPC Activity Manager is LBNL's corrective action to a finding from the 2009 Independent Oversight Inspection conducted by DOE. The finding states:

> "*The LBNL job hazard analysis process design and implementation does not sufficiently ensure that all hazards at the activity level are systematically identified, analyzed, and controlled, as needed to ensure compliance with 10 CFR851, Worker Safety and Health Program, DOE Policy 450.4, Safety Management System Policy, and the LBNL Health and Safety Manual*."

This self-assessment will focus on the initial implementation of WPC Activity Manager within ATAP.

Assessment Categories (General)

Compliance with Institutional Requirements

ATAP's self-assessments will include evaluation of compliance with institutional requirements, including:

1. ES&H Manual, Chapter 6, *Safe Work Authorization;*
2. ES&H Manual, Chapter 18, *Lockout Tagout Program;*
3. LBNL Requirements and Policies Manual*, Hazard Analysis & Work Authorization Policy and Overview;*
4. LBNL Requirements and Policies Manual, *Lockout-Tagout Program;*
5. LBNL Pub-3140*, Integrated Environment, Safety, & Health Management Plan*, Integrated Safety Management (ISM) System

Compliance with Established Divisional Requirements

ATAP's self-assessment includes evaluation of compliance with divisional requirements, including the ATAP ISM Plan.

Scope

Following completion of Self-Assessment training provided by the Office of Contractor Assurance at the initial team meetings and study of related background information during November - December 2014, the ATAP Focus Area Assessment Teams will further define the factors to include in the scope of the Division assessments. The ATAP assessment will include the scope of the institutional self-assessments, but may also include other related issues, to be determined by the assessment team. The scope of each Focus Area self-assessment is outlined below:

Focus Area 1. Lockout/Tagout

a. Locations where ATAP LOTO work takes place;
b. ATAP employees, affiliates, and matrixed personnel; and
c. Lockout-Tagout performed by ATAP or matrixed personnel.

Focus Area 2. Work Planning and Control

a. Locations where ATAP work takes place;
b. ATAP employees, affiliates and matrixed personnel; and
c. Process of establishing Work Planning and Control Projects and Activities.

The scope of the institutional self-assessment covers the authorization of work under the new work planning and control system (WPC Activity Manager). The institutional self-assessment excludes assessment of execution to the requirements within the Activities and assessment of the adequacy of the pre-established hazards and their associated controls in WPC Activity Manager. The institutional assessment attempts to ask and answer if we have the right work authorizations in place.

Frequency and Schedule

Focus Area 1. – This assessment will take place between October 1, 2014 and May 31, 2015. The Focus Area Self-Assessment Team will generate and submit a report to ATAP management by May 31, 2015. ATAP will submit a report to the Office of Contractor Assurance by June 30, 2015 identifying findings, observations, noteworthy practices and corrective actions.

Focus Area 2. – This assessment will take place between October 1, 2014 and May 31, 2015. The Focus Area Self-Assessment Team will generate and submit a report to ATAP management by May 31, 2015. AFRD will submit a report to the Office of Contractor Assurance by June 30, 2015 identifying findings, observations, noteworthy practices and corrective actions.

Further scheduling details for the Focus Area assessments are as follows:

- **September – October 2014** – Program Heads selected team members.
- **December 2014 – January 2015** -- The Office of Contractor Assurance provided Self-Assessment training to team members at their initial meetings.
- **February - May 2015** – The teams will further refine their assessment scope, methodology, lines of inquiry, and schedule. The teams will perform their assessments, which may include visits to selected ATAP work areas and interviews of selected personnel. Each team will develop a report specific to the focus area they have assessed and present their findings and recommendations to ATAP management.

- **June – September 2015** – ATAP management will assign action items to appropriate personnel and track the status of the action items.

Methodology

Each Focus Area Self-Assessment Team will establish the methodology to be used when implementing their assessment. The team members will attend Self-Assessment Training provided by the Office of Contractor Assurance and consulted with the appropriate Subject Matter Experts and the Office of Contractor Assurance while developing their methodology. The methodology is assessment-specific and includes the following basic elements:

A. Person(s) conducting each assessment:

Focus Area 1. Lockout/Tagout
a. Focus Area Self-Assessment Team members (selected by ATAP Program Heads) will conduct the assessment: Warren Byrne (ALS Accelerator Physics), Jeroen van Tilborg (BELLA), Kerri Campbell (CBP), Tom Lipton (FS&IBT and Supercon).
b. Subject Matter Expert (Stephanie Collins) will provide advice, as needed.

Focus Area 2. Work Planning and Control
a. Focus Area Self-Assessment Team members (selected by ATAP Program Heads) will conduct the assessment: Hiroshi Nishimura (ALS Accelerator Physics), Csaba Toth (BELLA), John Byrd (CBP), Thomas Schenkel (FS&IBT), Dan Dietderich (Supercon).
b. Subject Matter Expert (Scott Taylor) will provide advice, as needed.

B. Techniques to be used during the assessment

Focus Area 1. – The Focus Area Self-Assessment Team may review related documentation and websites, consult with subject matter experts, visit selected work locations, observe work, conduct a survey and/or interview personnel, and document their reviews. At a minimum, the LOTO Self-Assessment team will:

- Review training records of persons who perform LOTO;
- Review selected LOTO procedures;
- Interview selected personnel who perform LOTO; and
- Observe selected LOTO work performed by ATAP or matrixed personnel.

Focus Area 2. – The Focus Area Self-Assessment Team may review related documentation and websites, consult with subject matter experts, conduct a survey and/or interview personnel, and document their reviews. At a minimum, the Work Planning and Control Self-Assessment team will:

- Review a representative number of activities within WPC Activity Manager;
- Inspect work areas and comparing this to information in Activities within Activity Manager;

- Interview workers to understand the work they do and evaluate whether the scope of work, hazards and controls are clearly and accurately described in Activities;
- Interview Project Leads, Activity Leads, and Supervisors to determine whether the work is appropriately authorized.

General Lines of Inquiry

Focus Area 1. Lockout/Tagout – The Focus Area Self-Assessment Team will develop lines of inquiry to determine whether hazards are properly identified and controlled. The Focus Area Self-Assessment Team may consult with appropriate Subject Matter Experts. EHS will be coordinating a multi-Division effort and has suggested some common lines of inquiry:

- Do division LOTO procedures meet requirements of the ES&H Manual?
- Are LOTO procedures properly reviewed?
- Are people performing LOTO properly trained?
- Are people knowledgeable of the requirements of the LOTO procedures they are implementing?
- Are Responsible Individuals properly trained and knowledgeable of their responsibilities?

Focus Area 2. Work Planning and Control – The Focus Area Self-Assessment Team will develop lines of inquiry to determine optimal methods of improving safety culture. The Focus Area Self-Assessment Team may consult with appropriate Subject Matter Experts. EHS will be coordinating a multi-Division effort and has suggested some common lines of inquiry:

- Are work activities covered by activities within WPC Activity Manager?
- Are descriptions of work sufficiently detailed to be able to determine all applicable hazards?
- Are hazards of the activities being appropriately identified in WPC Activity Manager?
- Are descriptions of work sufficiently detailed to clearly communicate to the worker the scope of work for the authorization?
- Are the hazards and controls sufficiently customized so that the worker understands what controls apply to the specific work they are doing?
- Are workers authorized by activities that cover all of the work they perform?

QUEST

The main objective of QUEST is the identification and mitigation of any condition or process that jeopardizes the safety and health of employees, protection of the environment, or the quality of ATAP research or operations. The QUEST process involves all long-term ATAP personnel to raise awareness of ES&H and quality issues and develop the habit of identifying, reporting, and resolving potential problems before accidents or occurrences result. QUEST teams are also encouraged to identify opportunities for improvement, examine each of these opportunities, and implement those actions that they believe will lead to the improvement desired.

ATAP management reviews and updates the QUEST program annually. This year, there will be a special emphasis on **Electrical Safety.** One of the purposes of this year's assessment will be to raise awareness of new requirements and assess our readiness to implement them. The QUEST checklists have been updated to reflect pending changes to the Electrical Safety Program.

QUEST Teams

All ATAP personnel (including Division employees, matrixed employees, visitors, temporary employees, students, and participating guests) are assigned to at least one QUEST self-assessment team, with the exception of short-term personnel (persons whose participation in ATAP work activities at LBNL are anticipated to occur over a period of less than 90 days/year). Persons whose participation in work activities at ATAP are anticipated to occur over a period of less than 90 days may be included in a QUEST team as determined by the Program Head. For 2015, the teams will be organized by work groups sharing work locations, with at least one person from a different work participating on each team.

ATAP ALS Accelerator Physics Program personnel are assigned to ALS Division Safety Circles, which participate in ALS Division self-assessment activities.

Each team member should have an active role to play in some facet of QUEST activities each year, such as updating the team roster, doing a self-assessment inspection, discussing concerns or taking minutes at meetings, entering findings into the Corrective Action Tracking System, or resolving corrective actions. This year, QUEST teams will be involved in comprehensive workplace assessments on ATAP Safety Day (February 23, 2015).

February 2015 QUEST Activities

Workplace Assessments

Each team will have charge of self-assessment for the workspace of its members. Program ES&H Coordinators must coordinate team assignments to ensure the annual inspections cover all the Program space at LBNL. (ALS Accelerator Physics personnel will participate in ALS Division self-assessment activities, as directed by the ALS ES&H Manager and Administrator.)

Each QUEST team is required to perform an assessment of workplace safety hazards and environmental management practices during their February 2015 Safety Day. Use of the applicable ES&H Checklists (QUEST Checklist for Offices, QUEST Checklist for Labs, QUEST Checklist for Shops) is required. If teams see other safety concerns that are not on the checklists, they should be reported as well. Any observations of unsafe behaviors should be noted without using names of people observed.

Team Meetings

QUEST teams must meet during the February 23, 2015 Safety Day. All team members are encouraged to attend. At the meeting, the team will discuss the workplace inspection findings and solicit additional reports of concerns from team members. Team members are encouraged to report any other work-related environmental, health, safety, or quality assurance concerns. Teams may also use the **Electrical Work Discussion Guide** to provide additional feedback to ATAP management on Qualified Electrical Worker needs.

BELLA Center Accelerator Safety Self-Assessment

A new activity this year is the BELLA Center Accelerator Safety Self-Assessment. The purpose of this assessment is to maintain BELLA Center accelerator safety systems and help prepare for the next triennial review by identifying any needs for updating documents or resolving safety issues. The assessment scope should include a review of the results of EHS surveillance and a summary of institutional assurance activities reviewed by the Accelerator Readiness Safety Committee since the previous triennial review (November 2013), using the **BELLA Center Accelerator Safety Self-Assessment Guide.**

Recordkeeping and Follow-up

Each QUEST team maintains a record of its activities including a list of members, minutes and attendance rosters for meetings, inspection findings, and actions taken or planned. [Forms are provided as recommended tools for recordkeeping: (QUEST Team Roster), (QUEST Meeting Report), (ES&H/QA Concerns Report) (Electrical Work Discussion Guide)]. The team leader will provide copies or links to the team records to the Program ES&H Coordinator. The Program Safety Coordinators will present a summary of their findings at an all-hands meeting at the end of ATAP Safety Day.

The QUEST Team members or Program ES&H Coordinator are encouraged to enter unresolved ES&H action items into the Corrective Action Tracking System (CATS) database. There is a convenient feature on the CATS database menu, "Add New Quick Entry Issue". This choice leads to a screen to enter the Division, Issue Description, and Building/Room where the issue was found. There are optional fields for additional location information and suggested corrective action. When the Route button is selected, ATAP CATS will be sent to the ATAP ES&H Coordinator to finish filling in the details and assign a responsible person and due date. Program Safety Coordinators, QUEST teams, and supervisors doing walkthroughs are encouraged to use the Quick Entry feature to track their action items. There is also a feature on the CATS database that allows us to record safety concerns that were found and fixed immediately. Use of this feature is voluntary. ATAP encourages QUEST teams to use it, especially to record any actions that may provide Lessons Learned or Best Practices for the LBNL community.

The Program ES&H Coordinator will discuss unresolved concerns at the March 2015 ATAP ES&H Operations Committee meeting. The ATAP ES&H Operations Committee will review the concerns and develop a safety improvement action plan.

Optional QUEST Activities

Program Heads may establish additional requirements for QUEST activities within their Program.

In addition to the required February 2015 activities, QUEST teams are encouraged to remain active throughout the year. Team meetings are one way of providing feedback to the team on the actions that have been taken as a result of the concerns team members have identified. QUEST team meetings are also an opportunity to pass along relevant information from the ATAP ES&H Operations Committee. Some QUEST teams find value in meeting periodically throughout the year. Appropriate meeting topics include any issue affecting safety, the environment, or quality assurance. Teams are encouraged to choose topics that are "local issues" and fit their needs.

Teams may choose to perform additional assessments of particular areas or aspects of their work. If deficiencies are uncovered, corrections should be made immediately when practical, or recorded in CATS for further action. Items requiring the assistance to correct, or for which additional guidance is needed should be promptly referred to the ATAP ES&H Coordinator through the Program ES&H Coordinator.

QUEST Team Roster

Program:_____

Team Name (optional):_____

Team Leader:_____

Assessment Area(s):_____

Employee Name	**Employee ID #**

February 2015 QUEST Activities

Workplace Assessments

Each team will have charge of self-assessment for the workspace of its members. Program ES&H Coordinators must coordinate team assignments to ensure the annual inspections cover all the Program space at LBNL. (ALS Accelerator Physics personnel will participate in ALS Division self-assessment activities, as directed by the ALS ES&H Manager and Administrator.)

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A new activity this year is the BELLA Center Accelerator Safety Self-Assessment. The purpose of this assessment is to maintain BELLA Center accelerator safety systems and help prepare for the next triennial review by identifying any needs for updating documents or resolving safety issues. The assessment scope should include a review of the results of EHS surveillance and a summary of institutional assurance activities reviewed by the Accelerator Readiness Safety Committee since the previous triennial review (November 2013), using the **BELLA Center Accelerator Safety Self-Assessment Guide.**

Recordkeeping and Follow-up

Each QUEST team maintains a record of its activities including a list of members, minutes and attendance rosters for meetings, inspection findings, and actions taken or planned. [Forms are provided as recommended tools for recordkeeping: (QUEST Team Roster), (QUEST Meeting Report), (ES&H/QA Concerns Report) (Electrical Work Discussion Guide)]. The team leader will provide copies or links to the team records to the Program ES&H Coordinator. The Program Safety Coordinators will present a summary of their findings at an all-hands meeting at the end of ATAP Safety Day.

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Teams may choose to perform additional assessments of particular areas or aspects of their work. If deficiencies are uncovered, corrections should be made immediately when practical, or recorded in CATS for further action. Items requiring the assistance to correct, or for which additional guidance is needed should be promptly referred to the ATAP ES&H Coordinator through the Program ES&H Coordinator.

ATAP QUEST Team ES&H/QA Concerns Report

Please submit completed forms to Program ES&H Coordinator

Date Found:_____

Name(s) of Finder(s)*:_____

Program:_____

_____

Concern:

Location: Bldg:_____ Room and/or Area:_____

Description:

_____
_____
_____
_____
_____

Status:

___ Resolved (date)_____

___ Will be resolved by this team, or

___ Referred to ES&H Coordinator, or

___ Referred to _____

_____

Concern:

Location: Bldg:_____ Room and/or Area:_____

Description:

_____
_____
_____
_____
_____

Status:

___ Resolved (date)_____

___ Will be resolved by this team, or

___ Referred to ES&H Coordinator, or

___ Referred to _____

QUEST Meeting Report

Please submit copy of completed forms to Program ES&H Coordinator

ATAP

QUality **E**S&H **S**elf-Assessment **T**eamwork

Team Leader_____

Program:_____

Date:_____

QA/ES&H Topic(s) of Discussion:

Items of ES&H/QA Concern:

1._____

_____

Resolved Immediately ☐ **or** (DATE)_____

Will be Resolved by this team ☐ **or**

Referred to ES&H Coordinator ☐ **or**

☐ Referred to:_____

2._____

_____

Resolved Immediately ☐ **or** (DATE)_____

Will be Resolved by this team ☐ **or**

Referred to ES&H Coordinator ☐ **or**

☐ Referred to:_____

3._____

_____

Resolved Immediately ☐ **or**

Will be Resolved by this team ☐ **or**

Referred to ES&H Coordinator ☐ **or**

☐ Referred to:_____ **or**

Attendance (please print)

QUEST SELF-ASSESSMENT CHECKLIST for OFFICES

EMERGENCY PREPAREDNESS

Have up-to-date emergency evacuation routes and assembly areas been posted?

Are there any outdated or non-standard signs that need to be removed? Check bulletin boards and remove any outdated materials.

Are copies of the Emergency Response Guide (red/orange/yellow flip chart) posted? Is the site specific information (red tabs in the Guides) filled out and correct? ***Tip: contact Pat Thomas ext. 6098 for copies of the Emergency Response Guide.***

Talk to your Building Emergency Team Leader(s):

-- Are there Emergency Team members assigned to sweep each area that may need to be evacuated?

-- Have Emergency Team members completed required training?

-- Has the Building Emergency Team held or scheduled a hands-on drill during FY15 (in addition to the Lab-wide earthquake exercise)?

-- Do all team members know how to use the emergency radio?

-- Is there an up-to-date list of Building Emergency Team members?

-- Is there a current Building Emergency Plan available?

-- -- Do all team members know where the nearest trauma kit and emergency equipment box are located? Does the Emergency Team Leader have a key to the emergency equipment box? Are the supplies in the Trauma Kits and Emergency boxes adequate and up-to-date? Has your building received the small, clear plastic Trauma Kits?

Are aisles, walkways, stairways, and exit doors unobstructed? Is the area free of tripping hazards?

Check the area outside your building. Are there any burned-out lights, tripping hazards, worn or damaged steps, or other conditions that make walking hazardous? Are there any areas where traffic / bicycle / pedestrian safety could be improved?

Have all heavy objects that could fall during an earthquake been secured safety (no bungee cords)?

_____

Is fire extinguisher access unobstructed?

_____

Where emergency egress lights are easily reachable without climbing ladders, test by depressing button. Are all emergency lights, including any illuminated EXIT signs, in good operating condition?

_____

Talk to your Program Head. Can the Program Head find and access the Business Continuity Plan / Essential Functions for your Program? Has the plan been reviewed and updated within the last year?

_____

Are there any types of office work in your area that should not be performed alone? This might include work with significant hazards where a person might become so severely injured that they could not summon help, work in a location where a person would not be seen if they were incapacitated, or work by people who are inexperienced or unfamiliar with the area? Does your group have documented rules for any work that should not be performed alone?

_____

ERGONOMICS

Are there any people in the area who would like to request an ergonomic evaluation? (Note anyone who has moved recently.) Are there laptop users who have not had an evaluation?

_____

Check the chairs in your area. Are there any damaged or defective chairs that need replacement?

_____

OFFICE EQUIPMENT

Are there copies of the manufacturer's operation and maintenance procedures available where needed? Is equipment in good condition (no broken parts, required guards in place)?

_____

ELECTRICAL SAFETY

Is access to electrical panels, including breaker boxes and disconnects, unobstructed? Is the working space for accessing electrical panels and electrical equipment at least 3' wide x 3' deep x 6.5' high? (Note: equipment >150V will require additional clearance – contact a QEW to check).

_____

Does each electrical panel have a schedule posted nearby indicating the purpose of all breakers and disconnects? Are all breakers and disconnects numbered or otherwise identified?

_____

Are electrical panels and breaker boxes in good condition (intact, screws in place, door latches work, no materials stored on top)?

_____

Are all wall-mounted plug strips, receptacles and outlets in good condition?

_____

Are labeled ground fault circuit interrupters (GFCIs) located on electrical outlets near water outlets and other areas where they may get wet? Are all electrical appliances (toasters, microwaves, coffeemakers, etc.) within 6 feet of a sink protected by GFCIs?

_____

Test your GFCIs. Testing a GFCI is very simple and can be done safely by anyone. Apply a load (plug something in) to the GFCI, press the TEST button. Does the power trip off? Press the RESET button. Does it come back on? Are any of the buttons stuck?

_____

Are power / extension cords in good condition (3-conductor plugs with ground prongs in good condition, no frayed insulation or exposed wiring, no evidence of modification)? Are unused extension cords unplugged and rolled up and stored properly?

_____

Are power/ extension cords used properly (appropriate for the load, covered with a bridge if in walkways);

NOT:

- draped over furniture or fire sprinkler lines,
- extending through doors or windows,
- attached to walls with staples,
- used to support the weight of equipment,

- m
  ore than 2 extension cords attached together?

Have any extension cords been in use for longer than 1 month?

Are relocatable power taps (plug strips) in good condition and used properly?

NOT:

- u
  sed outdoors,
- c
  onnected to another power tap or more than 1 extension cord,
- p
  ermanently attached,
- c
  onnected to equipment over 600 Watts/5 amps (such as heaters, cooking appliances, or fans) unless specifically rated for the load]?

Are electrical conduits free of attached cord, lines, equipment, decorations or other materials?

OFFICE WORK BEHAVIOR OBSERVATIONS

Computer work: working with no pain or discomfort, feet flat on floor or on footrest with plenty of room to move around; chair comfortable with back well-supported; wrists straight and supported by adjustable armrests or Morensi board; head and neck straight forward or slightly down (top of monitor at eye height); avoids overextending reach; stretches periodically. Uses docking station for laptop work. Note any potential problems you observed for follow-up by Ergo Advocate:

Lifting: tests weight before lifting; gets help with large/awkward items; avoids awkward body positioning; bends knees when lifting; avoids bending over, twisting, overextending; checks path for hazards before carrying. Note any problems you observed for follow-up by ergonomist:

Other Repetitive Motion: Plans work and gets help before taking on extended repetitive tasks. Takes breaks as needed to prevent overuse injuries. Re-evaluates when workload or schedule changes. Note any potential problems you observe for follow-up by ergonomist:

_____

_____

QUEST SELF-ASSESSMENT CHECKLIST For LABS

GENERAL SAFETY

Are interlock test procedures posted or readily available? Are interlock systems tested at least twice yearly when equipment is active (posted record of test or notes of inactivity within the last 6 months)?

Are current work authorizations posted or readily available for experiments that require them? Are lists of authorized personnel up-to-date? Are there experiments, clean-up/construction projects, or other non-routine operations with significant hazards that might need a documented hazard analysis and work authorization?

Do all entrances to labs have signs next to doors describing hazards, PPE requirements, and contact people? Are there any outdated or non-standard signs? ***Contact the Area Safety Lead to update door signs. Check bulletin boards and remove any outdated materials.***

Is appropriate PPE (eyewear, lab coats, gloves, etc.) conveniently available, properly stored, and in good condition in areas where it is required? Are closed-toed shoes worn in all lab areas and safety shoes worn where heavy or sharp objects could cause injury?

Are food and beverages kept out of areas where chemicals are stored or used? Is there a conveniently located non-technical area where food and beverages are allowed to be consumed?

Are sharp cutting tools (razor blades, scalpels, knives, etc.) stored with the blade covered? Are there red sharps disposal containers available near areas where sharps are used? (Note any full containers that need to be picked up.)

Check the chairs in your area. Are there any damaged or defective chairs or stools that need replacement?

EMERGENCY PREPAREDNESS

Have up-to-date emergency evacuation routes and assembly areas been posted?

Are there any outdated or non-standard signs that need to be removed? Check bulletin boards and remove any outdated materials.

Are copies of the Emergency Response Guide (red/orange/yellow flip chart) posted? Is the site specific information (red tabs in the Guides) filled out and correct? ***Tip: contact Pat Thomas for copies of the Emergency Response Guide.***

Talk to your Building Emergency Team Leader(s):

-- Are there Emergency Team members assigned to sweep each area that may need to be evacuated?

-- Have Emergency Team members completed required training?

-- Has the Building Emergency Team held or scheduled a hands-on drill during FY15 (in addition to the Lab-wide earthquake exercise)?

-- Do all team members know how to use the emergency radio?

-- Is there an up-to-date list of Building Emergency Team members?

-- Is there a current Building Emergency Plan available?

-- Do all team members know where the nearest trauma kit and emergency equipment box are located? Does the Emergency Team Leader have a key to the emergency equipment box? Are the supplies in the Trauma Kits and Emergency boxes adequate and up-to-date? ? Have you received the small, clear plastic Trauma Kits?

Are aisles, walkways, stairways, and exit doors unobstructed? Is the area free of tripping hazards?

Check the area outside your building. Are there any burned-out lights, tripping hazards, worn or damaged steps, or other conditions that make walking hazardous? Are there any areas where traffic / bicycle / pedestrian safety could be improved?

Have all heavy objects that could fall during an earthquake been secured safely (no bungee cords)?

_____

Is fire extinguisher access unobstructed? Are the types of fire extinguishers appropriate to the type of fire you might have in the areas (A= ordinary combustibles, B=flammable liquids, C=electrical, D=metals)?

_____

Have eyewashes and safety showers been inspected within the last 3 months? Are they in good condition? Is access unobstructed? Are eyewashes located so that someone with chemicals in their eyes would be able to reach the eyewash within 10 seconds?

_____

Are there adequate numbers and appropriate types of spill kits (e.g., flammable, acid, and base) available in work areas where they may be needed?

_____

Where emergency egress lights are easily reachable without climbing ladders, test by depressing button. Are all emergency lights, including any illuminated EXIT signs and laser signs, in good operating condition?

_____

Are there any types of lab work in your area that should not be performed alone? This might include work with significant hazards where a person might become so severely injured that they could not summon help, work in a location where a person would not be seen if they were incapacitated, or work by people who are inexperienced or unfamiliar with the area. Does your group have documented rules for any work that should not be performed alone?

_____

EQUIPMENT GUARDING & SAFETY

Does any laboratory equipment have reasonably accessible points of operation, pinch and nip points, rotating parts, and flying chip or spark hazards that may expose an employee to injury? (Examples include presses, heat sealers, polishers, cutting equipment, and rotating transmission components such as belt drives, gears, and rotating shafts over 10 rpm.) Have all these hazards been guarded to prevent injuries:

-- Points of operation (cutting, shaping, boring, bending, punching, etc.)?

-- Power transmission apparatuses (pulleys, belts, flywheels, couplings, cams, spindles, chains, cranks, gears, etc.)?

-- Nip and pinch points?

-- Hot surfaces?

-- Entanglement hazards?

-- Chips/flying materials, splashes, or sparks?

Do the guards themselves pose a safety hazard?

Tip: See ES&H Manual Chapter 25, Appendix C for examples or contact Mike Wisherop for assistance.

If there are manufacturer's maintenance and operating procedures, are they being followed?

For laboratory-made equipment, have maintenance and operating procedures been developed?

ELECTRICAL SAFETY

Is access to electrical panels, including breaker boxes and disconnects, unobstructed? Is the working space for accessing electrical panels and electrical equipment at least 3' wide x 3' deep x 6.5' high? (Note: equipment >150V will require additional clearance – contact a QEW to check).

Does each electrical panel have a schedule posted nearby indicating the purpose of all breakers and disconnects? Are all breakers and disconnects numbered or otherwise identified?

Are electrical panels and breaker boxes in good condition (intact, screws in place, door latches work, no materials stored on top)?

Are all wall-mounted plug strips, receptacles, and outlets in good condition?

Are labeled ground fault circuit interrupters (GFCIs) located on electrical outlets near water outlets and other areas where they may get wet? Is electrical equipment that is within 6 ft. of a safety shower/eyewash, sink, or other source of splashing either rated for use in a wet environment or protected by a GFCI?

Test your GFCIs. Testing a GFCI is very simple and can be done safely by anyone. Apply a load (plug something in) to the GFCI, press the TEST button. Does the power trip off? Press the RESET button. Does it come back on? Are any of the buttons stuck?

Are power / extension cords in good condition (3-conductor plugs with ground prongs in good condition, no frayed insulation or exposed wiring, no evidence of modification)? Are unused extension cords unplugged and rolled up and stored properly?

Are power/ extension cords used properly (appropriate for the load, covered with a bridge if in walkways);

NOT:

- d raped over furniture or fire sprinkler lines,
- e xtending through doors or windows,
- a ttached to walls with staples,
- u sed to support the weight of equipment,
- m ore than 2 extension cords attached together?

Are relocatable power taps (plug strips) in good condition and used properly?

NOT:

- u sed outdoors,
- c onnected to another power tap or more than 1 extension cord,
- p ermanently attached,
- c onnected to equipment over 600 Watts/5 amps (such as heaters, cooking appliances, or fans) unless specifically rated for the load]?

Have any extension cords been in use for longer than 1 month?

_____

Are cable trays properly grounded and used correctly (not overfilled, electrical and water lines separated, not used for flexible cords or extension cords)?

_____

Are all unused openings (including conduit knockouts) in electrical enclosures and fittings closed with appropriate covers, plugs, or plates?

_____

Are portable metal ladders clearly labeled "Do Not Use Around Electrical Equipment" and kept away from areas where the ladder or person using the ladder could come in contact with energized equipment?

_____

Are electrical conduits free of attached cord, lines, equipment, decorations or other materials?

_____

Is electrical equipment on metal carts or tables bonded, and grounding provided for metal carts used for electrical equipment?

_____

Is someone assigned and trained to survey non-NRTL electrical equipment in your area? Is there any non-NRTL equipment that has a potential of 50 Volts or greater anywhere in the equipment that has not been inspected and approved by the Electrical Equipment Inspection Program?

_____

Is portable electric equipment and accessories rated for circuits and equipment to which they will be connected? (Check the equipment nameplate for rating information. This will typically include voltage, amperes, and wattage.)

_____

CHEMICAL SAFETY

Are floors and work surfaces free of chemical residues?

_____

Are chemical containers and gas cylinders in good condition (not leaking, rusted, dented, etc.)?

_____

Are chemical containers and gas cylinders labeled with name of chemical contents and hazard?

_____

Have chemicals been entered into the Chemical Management System? (Check for a barcode on the container or on a Multi-Container Inventory Sheet posted nearby.) Have chemicals >1 gallon inside equipment been inventoried (bar code on Multi-Container inventory sheet, or entered into Hazards Management System database)?

Do workers know how to find and use Material Safety Data Sheets / Safety Data Sheets?

Pick a chemical container or gas cylinder. Ask a worker in the area to show you the MSDS/SDS and identify the hazards of the chemical.

- Does the worker know what an MSDS or SDS is?
- Can they quickly produce a current MSDS/SDS (either hard copy or from the website)?
- Can they find the hazard information?

Are chemicals and gases stored properly?

Examples:

- Acids separated from bases?
- Corrosives (acids and bases) separated from flammables and toxics?
- Acetic acid stored with flammables?
- Flammables >10 gal. stored in flammables cabinet?
- Flammables and gas cylinders protected from heat and sources of ignition?
- Stored in approved containers, tightly closed and covered when not in use?
- Containment pans under liquids?
- Gas cylinders secured by metal bracket, top and bottom chains, or on a cart secured to prevent rolling or tipping?
- Regulators removed from gas cylinders not in use?
- Chemicals and gases stored away from stairs and exits?
- Overhead storage shelves equipped with shelf lips or latched doors?
- Hazardous liquids stored away from sinks and drains?

Are ventilation systems uncluttered (air flow not blocked)? Is there a sticker indicating ventilation systems have been inspected and tested within the last two years?

Have potential lead hazards been identified and controlled (lead bricks and shielding covered, lead not needed for shielding removed from work areas, no old paint peeling or chipping)?

For cryogens, has the Oxygen Deficiency Hazard been evaluated?

HAZARDOUS WASTE and SATELLITE ACCUMULATION AREAS

Are nitric acid wastes being generated that may require bench- top treatment (reaction mixture or aqueous solutions >5% HNO_3 by weight, 0.8M, or pH <1, or any organic or metal contaminants)? Is there an approved bench top treatment procedure in place?

_____

Is the Satellite Accumulation Area (SAA) near the point the where the waste is generated? Can access to the SAA be controlled by the responsible person (locked up or within visual contact from work area?)?

_____

Has an SAA sign been posted at each hazardous waste accumulation area? Has the sign been filled out completely and accurately with the name of the responsible person, building/room, telephone number, and type of waste?

_____

Is there a Hazardous Waste label attached to each container? Is the label filled out with the name and phone number of the generator, building/room location, type of waste, hazards, waste form (solid/liquid), and accumulation start date?

_____

Are there any wastes that have been in the SAA for more than 9 months?

_____

Are all waste containers in good condition (not leaking, bulging, etc.)?

_____

SUSPECT/COUNTERFEIT PARTS

Do key personnel know how to identify and report suspect parts? (How long since they received training?)

_____

Are periodic inspections of facilities, equipment, spaces and parts stocks being conducted to identify suspect parts?

_____

Are high strength fasteners (bolts, nuts, screws, and washers) certified and controlled since purchase? Are certifications for installed high-strength fasteners available for review?

_____

Are the following types of items assessed for possible suspect/counterfeit parts when received through procurement or obtained from other groups:

- High-strength fasteners (bolts, nuts, screws, washers);
- Electrical/electronic components (circuit breakers, current and potential transformers, fuses, resistors, switch gear, overload and protective relays, motor control centers, heaters, motor generator sets, DC power supplies, AC inverters, transmitters, computer components, semiconductors);
- Piping components (fittings, flanges, valves and valve replacement products, couplings, plugs, spacers, nozzles, pipe supports);
- Pre-formed metal structures;
- Elastomers (O-rings, seals);
- Spare/replacement kits from suppliers other than the original equipment manufacturer;
- Weld filler material;
- Diesel generator speed governors; and
- Pumps?

LAB WORK BEHAVIOR OBSERVATIONS and DISCUSSION

(NOTE: Any observations of unsafe behaviors should be noted without using names of people observed – just note the location.)

Lifting: tests weight before lifting; gets help with large/awkward items; avoids awkward body positioning; bends knees when lifting; avoids bending over, twisting, overextending; checks path for hazards before carrying. Note any potential problems you observe for follow-up by ergonomist:

Repetitive Motion: Plans work and gets help before taking on extended repetitive tasks. Takes breaks as needed to prevent overuse injuries. Re-evaluates when workload or schedule changes. Note any potential problems you observe for follow-up by ergonomist:

PPE: wears protective equipment required in the area and appropriate to the job. Consider eye/face protection (goggles, face shield, safety glasses), gloves, hearing protection, foot protection, respiratory protection, clothing (lab coat, coveralls, apron).

Procedures: plans work, identifies hazards, ensures controls are effective, gets permits/work authorizations, checks condition of equipment before using, follows written procedures, obeys signs, performs LOTO when needed, leaves equipment and work area in clean and safe condition.

QUEST SELF-ASSESSMENT CHECKLIST for SHOPS

GENERAL SAFETY

Is the name of the Shop Manager and shop use policy posted on the shop door? Talk to the Shop Manager. Does the Shop Manager have readily available documentation of who has been authorized to use the shop?

Do all entrances to shops have signs next to doors describing hazards, PPE requirements, and contact people? Are there any outdated or non-standard signs? ***Contact the Area Safety Lead to update door signs. Check bulletin boards and remove any outdated materials.***

Is appropriate PPE (safety glasses, shop coats, gloves, etc.) conveniently available, properly stored, and in good condition in areas where it is required? Are closed-toed shoes worn in all shop areas and safety shoes worn where heavy or sharp objects could cause injury?

Are food and beverages kept out of shops? Is there a conveniently located and clearly marked room or area where food and beverages are allowed to be consumed?

Are sharp cutting tools (razor blades, scalpels, knives, etc.) stored with the blade covered? Are there red sharps disposal containers available near where sharps are used?

Are ladders clean and in good condition, with non-slip safety feet?

Check the chairs in your area. Are there any other damaged or defective chairs or stools that need replacement?

EMERGENCY PREPAREDNESS

Are copies of the Emergency Response Guide (red/orange/yellow flip chart) posted? Is the site specific information (red tabs in the Guides) filled out and correct? ***Tip: contact Pat Thomas for copies of the Emergency Response Guide.***

Are there any outdated or non-standard signs that need to be removed? Check bulletin boards and remove any outdated materials.

Talk to your Building Emergency Team Leader(s):

-- Are there Emergency Team members assigned to sweep each area that may need to be evacuated?

-- Have Emergency Team members completed required training?

-- Has the Building Emergency Team held or scheduled a hands-on drill during FY14 (in addition to the Lab-wide earthquake exercise)?

-- Do all team members know how to use the emergency radio?

-- Is there an up-to-date list of Building Emergency Team members?

-- Is there a current Building Emergency Plan available?

-- Do all team members know where the nearest trauma kit and emergency equipment box are located? Does the Emergency Team Leader have a key to the emergency equipment box? Are the supplies in the Trauma Kits and Emergency boxes adequate and up-to-date? ? Have you received the small, clear plastic Trauma Kits?

Are aisles, walkways, stairways, and exit doors unobstructed? Is the area free of tripping hazards?

Check the area outside your building. Are there any burned-out lights, tripping hazards, worn or damaged steps, or other conditions that make walking hazardous? Are there any areas where traffic / bicycle / pedestrian safety could be improved?

Have all heavy objects (furniture, computers, large equipment) that could fall during an earthquake been secured safely (no bungee cords)?

Is fire extinguisher access unobstructed? Are the types of fire extinguishers appropriate to the type of fire you might have in the areas (A= ordinary combustibles, B=flammable liquids, C=electrical, D=metals)?

_____

Is there a current permit from the Fire Department in place for any operation that produces flames, sparks, or heat (welding, heat treating, grinding, thawing pipe, powder-driven fasteners, hot riveting, etc.)?

_____

Have eyewashes and safety showers been inspected within the last 3 months? Are they in good condition? Is access unobstructed? Are eyewashes located so that someone with chemicals in their eyes would be able to reach the eyewash within 10 seconds?

_____

Are there adequate numbers and types of spill kits (e.g., flammable, acid, and base) available in work areas?

_____

Where emergency lights are easily reachable without climbing ladders, test by depressing button. Are all emergency lights in operating condition?

_____

Are there any types of shop work in your area that should not be performed alone? This might include work with significant hazards where a person might become so severely injured that they could not summon help, work in a location where a person would not be seen if they were incapacitated, or work by people who are inexperienced or unfamiliar with the area. Does your group have documented rules for any work that should not be performed alone?

_____

ELECTRICAL SAFETY

Is access to electrical panels, including breaker boxes and disconnects, unobstructed? Is the working space for accessing electrical panels and electrical equipment at least 3' wide x 3' deep x 6.5' high? (Note: equipment >150V will require additional clearance – contact a QEW to check).

_____

Does each electrical panel have a schedule posted nearby indicating the purpose of all breakers and disconnects? Are all breakers and disconnects numbered or otherwise identified?

_____

Are electrical panels and breaker boxes in good condition (intact, screws in place, door latches work, no materials stored on top)?

_____

Are all wall-mounted plug strips, receptacles and outlets in good condition? Are outlets near machines protected from metal chips?

Are labeled ground fault circuit interrupters (GFCIs) located on electrical outlets near water outlets and other areas where they may get wet?

Test your GFCIs. Testing a GFCI is very simple and can be done safely by anyone. Apply a load (plug something in) to the GFCI, press the TEST button. Does the power trip off? Press the RESET button. Does it come back on? Are any of the buttons stuck?

Are power / extension cords in good condition (ground prong, jackets in good condition, no frayed insulation or exposed wiring, no evidence of modification)? Are unused extension cords rolled up and stored properly?

Are electrical feeds to machines in good condition and grounded?

Are power/ extension cords used properly (appropriate for the load, covered with a bridge if in walkways);

NOT:

- draped over furniture or fire sprinkler lines,
- extending through doors or windows,
- attached to walls with staples,
- used to support the weight of equipment,
- more than 2 extension cords attached together?

Have any extension cords been in use for longer than 1 month?

Are relocatable power taps (plug strips) in good condition and used properly?

NOT:

- used outdoors,

- c onnected to another power tap or more than 1 extension cord,
- p ermanently attached,
- c onnected to equipment over 600 Watts/5 amps (such as heaters, cooking appliances, or fans) unless specifically rated for the load]?

Are portable metal ladders clearly labeled "Do Not Use Around Electrical Equipment" and kept away from areas where the ladder or person using the ladder could come in contact with energized equipment?

Are electrical conduits free of attached cord, lines, equipment, decorations or other materials?

Is electrical equipment that is within 6 ft. of a safety shower/eyewash, sink, or other source of splashing either rated for use in a wet environment or protected by a GFCI?

Is electrical equipment on metal carts or tables bonded, and grounding provided for metal carts used for electrical equipment?

Is someone assigned and trained to survey non-NRTL electrical equipment in your area? Is there any non-NRTL equipment that has a potential of 50 Volts or greater anywhere in the equipment that has not been inspected and approved by the Electrical Equipment Inspection Program?

MACHINE GUARDING AND CONTROLS

Check all machine tools that have reasonably accessible points of operation, pinch and nip points, rotating parts, and flying chip or spark hazards that may expose an employee to injury. Have all these hazards been guarded to prevent injuries:

-- Points of operation (cutting, shaping, boring, bending, punching, etc.)

-- Power transmission apparatuses (pulleys, belts, flywheels, couplings, cams, spindles, chains, cranks, gears, etc.)

-- Nip and pinch points

-- Entanglement hazards

-- Chips/flying materials, splashes, or sparks?

Do the guards themselves pose a safety hazard?

Tip: See ES&H Manual, Chapter 25, Appendix B for examples or contact Mike Wisherop for assistance.

Are starting and stopping controls within easy reach of the operator? Are machines protected from restarting automatically after a power interruption?

For grinders, does the guarding cover at least 75% of the wheel, including the spindle nut? Is the work rest adjusted closely to the wheel with a maximum clearance of 1/8 inch, and the adjustable tongue or end of the peripheral member at the top of the housing adjusted to within ¼ inch of the wheel?

For vertical band saws, is the guard lowered to the table when not in use?

Are machines designed for a fixed location securely anchored to prevent movement?

Is there sufficient clearance around and between machines to allow for safe operations, set up and servicing, material handling and waste removal?

CRANES, HOISTS, and FORKLIFTS

Is there a current, qualified employee designated as Crane Manager for each crane or hoist?

Is any electric powered crane that is not attended by a qualified operator for an entire shift and during off hours secured by locked controls, or equivalent means such as preventing access to the crane by locking the doors, or locking up radio controls?

Is secondary lifting gear in good condition?

Are all LBNL proof load tags and inspection stickers current? Does the load limit on the tag match the marking on the crane/hoist? Is the rated load of each crane/hoist legibly marked and visible to the operator?

_____

Have all active lifting devices (such as screw pin shackles, hoist rings, commercial equipment, etc.) and fixtures (such as spreader bars, special slings, equipment designed at the Laboratory, etc.) undergone a Non-Destructive Examination within the last 4 years? Are all inactive lifting devices and fixtures clearly marked “STOP DO NOT USE”?

Are the controls of hoists plainly marked to indicate the direction of travel or motion?

Is there a daily inspection tag or logbook? Is it being filled out whenever the crane/hoist is in use? Are cranes inspected at least once a month (whether or not they are used)?

When forklift trucks are left unattended, are the forks lowered, controls neutralized, hand brake set, wheels chocked, and keys removed from the ignition?

CHEMICAL SAFETY

Are floors and work surfaces free of chemical residues?

Are chemical containers and gas cylinders labeled with name of chemical contents and hazard?

Have chemicals been entered into the Chemical Management System? (Check for a barcode on the container or on a Multi-Container Inventory Sheet posted nearby.) Have chemicals >1 gallon inside equipment been inventoried (bar code on Multi-Container inventory sheet, or entered into Hazards Management System database)?

Do workers know how to find and use Material Safety Data Sheets or Safety Data Sheets? *Pick a chemical container or gas cylinder. Ask a worker in the area to show you the MSDS/SDS and identify the hazards of the chemical.*

- Does the worker know what an MSDS or SDS is?
- Can they quickly produce a current MSDS or SDS (either hard copy or from the website)?
- Can they find the hazard information?

Are chemicals and gases stored properly?

- Acids separated from bases?
- Corrosives (acids and bases) separated from flammables and toxics?
- Acetic acid stored with flammables?
- Flammables >10 gal. stored in flammables cabinet?
- Flammables and gas cylinders protected from heat and sources of ignition?
- Stored in approved containers, tightly closed and covered when not in use?
- Containment pans under liquids?
- Gas cylinders secured by metal bracket, top and bottom chains, or on a cart secured to prevent rolling or tipping?
- Regulators removed from gas cylinders not in use?
- Chemicals and gases stored away from stairs and exits?
- Overhead storage shelves equipped with shelf lips or latched doors?
- Hazardous liquids stored away from sinks and drains?

Has the performance of local ventilation systems been checked within the past two years (signed and dated inspection sticker?

For cryogens, has the Oxygen Deficiency Hazard been evaluated?

HAZARDOUS WASTE and SATELLITE ACCUMULATION AREAS

Are nitric acid wastes being generated that may require bench- top treatment (reaction mixture or aqueous solutions >5% HNO_3 by weight, 0.8M, or pH <1, or any organic or metal contaminants)? Is there an approved bench top treatment procedure in place?

Is the Satellite Accumulation Area (SAA) near the point the where the waste is generated? Can access to the SAA be controlled by the responsible person (locked up or within visual contact from work area?)?

Has an SAA sign been posted at each hazardous waste accumulation area? Has the sign been filled out completely and accurately with the name of the responsible person, building/room, telephone number, and type of waste?

Is there a Hazardous Waste label attached to each container? Is the label filled out with the name and phone number of the generator, building/room location, type of waste, hazards, waste form (solid/liquid), and accumulation start date?

Are there any wastes that have been in the SAA for more than 9 months?

_____

Are all waste containers in good condition (not leaking, bulging, etc.)?

_____

SUSPECT/COUNTERFEIT PARTS

Do key shop personnel know how to identify and report suspect parts? (How long since they received training?)

_____

Are periodic inspections of facilities, equipment, spaces and parts stocks being conducted to identify suspect parts?

_____

Are high strength fasteners (bolts, nuts, screws, and washers) certified and controlled since purchase? Are certifications for installed high-strength fasteners available for review?

_____

Are the following types of items assessed for possible suspect/counterfeit parts when received through procurement or obtained from other groups:

- High-strength fasteners (bolts, nuts, screws, washers);
- Electrical/electronic components (circuit breakers, current and potential transformers, fuses, resistors, switch gear, overload and protective relays, motor control centers, heaters, motor generator sets, DC power supplies, AC inverters, transmitters, computer components, semiconductors);
- Piping components (fittings, flanges, valves and valve replacement products, couplings, plugs, spacers, nozzles, pipe supports);
- Pre-formed metal structures;
- Elastomers (O-rings, seals);
- Spare/replacement kits from suppliers other than the original equipment manufacturer;
- Weld filler material;
- Diesel generator speed governors; and
- Pumps?

_____

SHOP WORK BEHAVIOR OBSERVATIONS and DISCUSSION

(NOTE: Any observations of unsafe behaviors should be noted without using names of people observed – just note the location.)

Lifting: tests weight before lifting; gets help with large/awkward items; avoids awkward body positioning; bends knees when lifting; avoid bending over, twisting, overextending; checks path for hazards before carrying

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PPE: wears protective equipment required in shop and appropriate to the job. Consider eye/face protection (goggles, face shield, safety glasses), gloves, hearing protection, foot protection, respiratory protection, clothing (shop coat, coveralls, apron).

Procedures: plans work, identifies hazards, ensures controls are effective, gets permits/work authorizations, checks condition of equipment before using, follows written procedures, obeys signs, performs LOTO when needed, leaves equipment and work area in clean and safe condition

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Tool use: selects the right tool for the job; only uses tools and equipment the worker is trained and authorized to use; ensures tools are in good condition and guards in place before using; uses proper techniques; does not work alone in shop

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BELLA Center Accelerator Safety Self-Assessment Guide

Date of Assessment:_____

Participants:_____

Scope: Every 3 years, BELLA Center must demonstrate that our self-assessment processes provide an adequate review of our safety systems and compliance with the Accelerator Safety Order. The most recent triennial review was in **November 2013**. The purpose of our annual BELLA Center Accelerator Safety Self-Assessment is to maintain our safety systems and help prepare for the next triennial review by identifying any needs for updating documents or resolving safety issues. The assessment scope should include a review of the results of EHS surveillance and a summary of institutional assurance activities reviewed by the Accelerator Readiness Safety Committee since November 2013, referring to the relevant sections of the following documents as needed:

- DOE Order 420.2C
- EHS 703, Institutional Assurance of Accelerator Safety
- EHS 703.1 Documentation for Accelerator Safety Order Compliance Activities
- Safety Assessment Document for Routine Operation, LOASIS Facility (LOASIS LPA SAD)
- BSO LOASIS Accelerator Review (LOASIS LPA ASE)
- RSC Report for the Review of the Personnel Protection System for the LOASIS LPA 4/24/2011
- Safety Assessment Document for Routine Operation, BELLA Facility (BELLA SAD)
- BSO BELLA Accelerator Review (BELLA ASE)

BELLA Center Accelerator Safety Self-Assessment Guide

Required safety analysis and credited controls	**Assurance Mechanism/ Data Source for LOASIS LPA**	**Assurance Mechanism/ Data Source for BELLA**	**Changes / Actions Needed**
1) A documented ASE must define the physical and administrative bounding conditions and controls for safe operations based on the safety analysis documented in the SAD. (DOE Order 420.2C, CRD, 1 ASE #1)	The LOASIS LPA ASE was submitted to BSO in 2010, and conditionally approved on 1/03/2011. A revised ASE has been submitted on 2/28/2011 w/closure of Conditions of Approval, and it was approved on 4/08/2011.	The BELLA ASE was submitted to BSO in May 2012, and it was approved on 6/7/2012.	
2) The ASE must be submitted to DOE for approval and may be submitted as a separate document from the SAD. (DOE Order 420.2C, CRD, 1 ASE #1)	The LOASIS LPA ASE was submitted to BSO and was approved.	The BELLA ASE was submitted to BSO and was approved.	
3) A SAD represents the technical basis for the ASE, is maintained current and must: a. identify hazards and associated onsite and offsite impacts to workers, the public, and the environment from the facility for both normal operations and credible accidents; (DOE Order 420.2C, CRD, 1 SAD #2)	The SAD was submitted to BSO in 2010.	The SAD was submitted to BSO in 2012.	*Updated SAD waiting for Wim Leemans' signature (new version with BELLA Center and new Division Director)*

4) b. contains sufficient descriptive information and analytical results pertaining to specific hazards and risks identified during the safety analysis process to provide an understanding of risks presented by the proposed operations; (DOE Order 420.2C, CRD, 1 SAD #2)	The SAD contains sufficient descriptive information and analytical results.	The SAD contains sufficient descriptive information and analytical results.	
5) c. provide detailed descriptions of engineered controls (e.g., interlocks and physical barriers) and administrative measures (e.g., training) taken to eliminate, control, or mitigate hazards from operation; (DOE Order 420.2C, CRD, 1 SAD #2)	The SAD contains detailed descriptions of engineering controls and expected results.	The SAD contains detailed descriptions of engineering controls and expected results.	
6) d. include or reference a description of facility function, location, and management organization in addition to details of major facility components and their operation. (DOE Order 420.2C, CRD, 1 SAD #2)	The SAD contains description of the accelerator components and operations.	The SAD contains description of the accelerator components and operations.	

7) Appropriate documentation shall be developed to authorize operations at an accelerator facility as defined in DOE O 420.2C (EHS 703.1 Documentation for Accelerator Safety Order Compliance Activities, 1.2 Scope)	The SAD follows 420.2B, and is in compliance with revision C.	The SAD follows 420.2B, and is in compliance with revision C.	
8) The SAD and ASE shall be developed by the accelerator program division, which has line management responsibility for the accelerator. (EHS 703.1 Documentation for Accelerator Safety Order Compliance Activities, 5.4 SAD/ASE Development)	The SAD and ASE include descriptions of responsibilities for the division and line managers.	The SAD and ASE include descriptions of responsibilities for the division and line managers.	
9) The SAD and ASE must follow the format established in the IG. Deviation from this format must be approved by the RPG prior to submission of the document for institutional approval (described in EHS Procedure 703)	The SAD and ASE follow the format established in the DOE Office of Inspector General (IG).	The SAD and ASE follow the format established in the DOE Office of Inspector General (IG).	

10) The RSC staffs the ARSC to prepare for the activity. The RSC, in conjunction with RCM, must document a formal charge for each ARSC. (EHS 703, Institutional Assurance of Accelerator Safety Order Compliance, 5.3.2 Institutional Assurance for Nonroutine Assurance Activities)	n.a.	n.a.	
11) DOE comments received on SADs and ASEs must be reviewed and responded to by the RCM and the cognizant accelerator program division. Formal responses to DOE comments must be forwarded through the RCM via the EHS Division Office to DOE. (EHS703, Institutional Assurance for of Accelerator Safety Order Compliance, 5.3.2 Institutional Assurance for Nonroutine Assurance Activities)	n.a.	n.a.	

12) If the SAD review indicates that it adequately addresses all safety hazards, but minor changes are needed for improved documentation, then an administrative update may be issued to the current version of the SAD. This process does not require institutional assurance or ASE review; however, copies of the update must be provided to the RCM and BSO (courtesy copy within thirty (30) days of the update. (EHS 703, Institutional Assurance of Accelerator Safety Order Compliance, 5.3.3 Institutional Assurance for Activities Required on a Defined Interval SAD/ASE Review)	Update of the SAD was in progress (2013 Nov), focusing on harmonization of the LOASIS LPA and BELLA accelerators; copies of the updates to be provided to RCM and BSO after finishing the updates.	Update of the SAD was in progress (2013 Nov), focusing on harmonization of the LOASIS LPA and BELLA accelerators; copies of the updates to be provided to RCM and BSO after finishing the updates.	*Updated SAD waiting for Wim Leemans' signature*

13) The ASE is reviewed and approved by the DOE Berkeley Site Office (BSO). Any activity violating the ASE must be terminated immediately and DOE / BSO must be promptly notified of the violation and are treated as reportable occurrences. (LOASIS SAD, Section 5.1 Introduction, Accelerator Safety Review)	The LOASIS LPA ASE was submitted to BSO in 2010, and conditionally approved on 1/03/2011. A revised ASE has been submitted on 2/28/2011 w/closure of Conditions of Approval, it was reviewed by BSO, and approved on 4/08/2011.	The BELLA ASE was submitted to BSO in May 2012. It was reviewed by BSO and approved on 6/7/2012.	

Implementation Procedures	**Assurance Mechanism/ Data Source for LOASIS LPA**	**Assurance Mechanism/Data Source for BELLA**	**Changes / Other Actions Needed**
14) As part of the ARR process, the contractor must demonstrate to the satisfaction of the Field Element Manager that the following processes are in place: a. A Contractor Assurance System that maintains an internal assessment process (DOE Order 420.2C, CRD, 1 ARR #4)	The current Triennial Review of the LOASIS LPA constitutes as part of the internal assessment process of the CAS	The current Triennial Review of BELLA constitutes part of the internal assessment process of the CAS	*Add QUEST workplace assessment and Accelerator self-assessment*
15) b. A Facility Configuration Management Program that is related to accelerator safety; (DOE Order 420.2C, CRD, 1 ARR #4)	Approved and current LOASIS-BELLA Configuration Control Policy and Checklists.	Approved and current LOASIS-BELLA Configuration Control Policy and Checklists.	*Review configuration control for this year's events*

16) c. Credited controls and appropriate administrative processes related to accelerator safety (e.g. training, procedures, etc.). (DOE Order 420.2C, CRD, 1 ARR #4)	Approved and current LOASIS Procedures related to Accelerator Safety: LSP04_Site-SpecificTraining LSP-05_Procedure Format; EC-02r4_Search & Clear; EC-01r7_Interlock Checklist	Approved and current BELLA Procedures related to Accelerator Safety: Procedure on Procedures – BOP-00; Procedure on Search & Secure - BOP-10; Procedure on PPS Annual Review - BOP-11; Procedure on Training - BOP-12; Procedure on EIC Training - BOP-12-Appx-2;	
17) The RCM must be provided with copies of all USI screens performed by an accelerator program division. (EHS 703, Institutional Assurance of Accelerator Safety Order Compliance, 5.3.4 Assured Compliance with Unreviewed Safety Issue Requirements)	Copies of all USI screenings have been provided to RCM, log maintained of total 6 USIs during review period (see Appendix)	Copies of all USI screenings have been provided to RCM, log maintained of total 3 USIs during review period (see Appendix)	*Verify this year's USIs have been resolved.*

18) If a potential safety-related discrepancy between the facility and the safety analysis is discovered it shall be documented. (EHS 703.1 Documentation for Accelerator Safety Order Compliance Activities Attachment E)	No discrepancy has been discovered.	No discrepancy has been discovered.	
19) A potential increase in consequences shall be evaluated by comparing the anticipated consequences of an accident with the consequences of a same or similar "family" of accident that has already been analyzed. (EHS 703.1 Documentation for Accelerator Safety Order Compliance Activities Attachment E, Q2)	No increase in consequences has been found.	No increase in consequences has been found.	

20) Procedures required by the ASE are present, approved and current. (DOE G 420.2-1 reference .II A. 5)	LOASIS Procedures required by the ASE are present, approved and current: - EC-02r4_Search & Clear; - EC-01r7_Interlock Checklist; - LOASIS-BELLA Configuration Control Policy and Checklists	BELLA Procedures required by the ASE are present, approved and current: - Procedure on Search & Secure - BOP-10; Procedure on PPS Annual Review - BOP-11; LOASIS-BELLA Configuration Control Policy and Checklists	*Also review other QA procedures. Verify all current. Use cover sheet if no revision.*
21) Beam interlock systems are established to prevent personnel exposure. (DOE G 420.2-1 reference I. B. 3a)	LOASIS LPA beam interlock systems designed, reviewed, approved, installed, verified and validated to prevent personnel exposure.	BELLA beam interlock systems designed, reviewed, approved, installed, verified and validated to prevent personnel exposure	
22) Beam interlock systems are maintained and tested using an approved procedure. (DOE G 420.2-1 reference II. B. 3a)	LOASIS Procedure: EC-01r7_Interlock Checklist; tests performed annually	BELLA Procedure on PPS Annual Review - BOP-11; tests performed annually	

23) Controlled Access to exclusion areas, if allowed, is authorized utilizing approved procedures. (DOE G 420.2-1 reference II. B. 3a)	Access to exclusion areas is not allowed	Access to exclusion areas is not allowed	

Effectiveness of Procedures	Assurance Mechanism / Data Source for LOASIS LPA	Assurance Mechanism / Data Source for BELLA	Changes / Actions Needed
24) How effective is the shielding? Does it meet the Shielding Policy; Is it ALARA; Does monitoring confirm shielding calculations? (LOASIS & BELLA ASE – RWA requirements)	Shielding effectively contains radiation during LOASIS LPA experiments, proven by on-line telemetry based on monitoring radiation detectors installed inside and outside of TEA	Shielding effectively contains radiation during BELLA experiments, proven by on-line telemetry based on monitoring radiation detectors installed inside and outside of TEA	
25) How well does the LOASIS-BELLA Shielding Control Procedure work? (LOASIS & BELLA ASE – OP 02-01)	18-month monitoring implemented, (last occurrence in Jan 2014; next in June 2015)	18-month monitoring will be implemented last occurrence in Jan 2014; next in June 2015)	
26) How effective are the LOASIS-BELLA interlocks? (LOASIS &BELLA ASE)	LOASIS LPA Interlock systems provide effective protection of workers via locking out the TEA during experiments and activating shutters if elevated radiation observed by monitoring detectors	BELLA Interlock systems provide effective protection of workers via locking out the TEA during experiments and activating shutters if elevated radiation observed by monitoring detectors	

27) How well do the LOASIS-BELLA interlock procedures work (design and work control)? (LOASIS &BELLA ASE)	LOASIS LPA Interlock procedures are developed via close collaboration with the LBNL interlock engineer and regularly reviewed, modified, if needed based on annual tests	BELLA Interlock procedures are developed via close collaboration with the LBNL interlock engineer and regularly reviewed, modified, if needed based on annual tests	
28) How effective is the search and secure procedure? (LOASIS &BELLA ASE)	The LOASIS LPA Search and Secure procedure is regularly implemented and effectively locks out workers from the TEA during experiments. All search and secure events are logged.	The BELLA Search and Secure procedure is regularly implemented and effectively locks out workers from the TEA during experiments. All search and secure events are logged.	
29) How well does the Beamline Review process work? (LOASIS &BELLA ASE)	Modification in the beamlines are controlled by the LOASIS-BELLA Configuration the Control Policy and Checklists: several examples show the appropriate review and authorization process (e.g.: addition of Staging beamline)	Modification in the beamlines are controlled by the LOASIS-BELLA Configuration Control Policy and Checklists: examples show the appropriate review and authorization process (e.g.: shielding requirement changes during pre-ARR process)	
[Items 30-34 identification of exempt and non-exempt accelerators not applicable]	n.a.	n.a.	n.a

Recommendations in the LOASIS LPA ASE Acceptance Report -- December 2010	Assurance Mechanism/Data Source for LOASIS LPA	Assurance Mechanism / Data Source for BELLA	Changes/Action Items
35) The accident analysis discussion in section 3.5.1 of the SAD should be relocated to Chapter 4, which provides the safety analysis and provides the technical basis for selection of credited controls. [Review and Acceptance Report (LOASIS LPA ASE, Rev 3), 4.2.1 Recommendations]	Update of the SAD was in progress (2013 Nov); copies of the updates will be provided to RCM and BSO after finishing the updates.	n.a.	*Updated SAD waiting for Wim Leemans' signature*
36) The role of the EIC should be clearly defined in chapter 4. [Review and Acceptance Report (LOASIS LPA ASE, Rev 3), 4.2.2 Recommendations]	Update of the SAD was in progress (2013 Nov); copies of the updates will be provided to RCM and BSO after finishing the updates.	n.a.	*Updated SAD waiting for Wim Leemans' signature*
[37 upper bounding radiological inventory/MAR not applicable]	n.a.	n.a.	n.a.

Recommendations in the LOASIS PPS Review – April 2011	Assurance Mechanism/Data Source for LOASIS LPA	Assurance Mechanism / Data Source for BELLA	Changes/Action Items
[Items 38-41 closed}	n.a.	n.a.	n.a.
42) Circuits identified in the Safety System Design and Implementation section of this report should be evaluated and corrected and the drawings updated to reflect the finished and installed design. (5) (LOASIS PPS review, 4/24/11)	Circuits has been evaluated during the LOASIS Interlock CAP - 2012, Final report: 7/23/2012	n.a.	*Check and verify status*
[Items 43-45 closed]	n.a.	n.a.	n.a.
46) Training to operate or maintain the safety interlock system should be documented. (9) (LOASIS PPS review, 4/24/11)	Training to operate the safety interlock system has been incorporated into RWA-OJT. Specific training and documentation for authorization of Experimenter-in-Charge (EIC) in progress	n.a.	*On-going – check status*

Recommendations in the BELLA ASE Acceptance Report – June 2012	Assurance Mechanism/Data Source for LOASIS LPA	Assurance Mechanism / Data Source for BELLA	Changes/Action Items
47) Include the administrative control establishing the upper bounding radiological inventory as less than thresholds defined in DOE STD 1027-92 which constitute a Hazard Category 3 nuclear facility as an initial condition for BELLA. LBNL should consider specifically citing the 500-millicurie limit specified in the hazard table for event 6a. (DOE BSO Review and Acceptance Report (BELLA ASE, Rev 0), 4.2.1 Recommendations)	n.a.	Update of the SAD was in progress (2013 Nov); copies of the updates will be provided to RCM and BSO after finishing the updates.	*Updated SAD waiting for Wim Leemans' signature*
48) Update event 1c in Table 4.2-3 of the SAD to reflect the crash off button as a preventive engineered control rather than a mitigative engineered control. (DOE BSO Review and Acceptance Report (BELLA ASE, Rev 0), 4.2.2 Recommendations)	n.a.	Update of the SAD was in progress (2013 Nov); copies of the updates will be provided to RCM and BSO after finishing the updates.	*Updated SAD waiting for Wim Leemans' signature*

49) Consider revising the consequence discussions to emphasize exposure rates and the timeframes over which the unmitigated consequence to a worker would become unacceptably high rather than giving a “potential dose/exposure”. (DOE BSO Review and Acceptance Report (BELLA ASE, Rev 0), 4.2.3 Recommendations)	n.a.	Update of the SAD was in progress (2013 Nov); copies of the updates will be provided to RCM and BSO after finishing the updates.	*Updated SAD waiting for Wim Leemans’ signature*
50) BSO noted that consequence discussions seemed to have used the terms “rem” and “rad” interchangeably. While this is a minor issue, BSO recommends that future revisions to the SAD ensure the correct terminology is used. (DOE BSO Review and Acceptance Report (BELLA ASE, Rev 0), 4.2.4 Recommendations)	n.a.	Update of the SAD was in progress (2013 Nov); copies of the updates will be provided to RCM and BSO after finishing the updates.	*Updated SAD waiting for Wim Leemans’ signature*

Electrical Work Discussion Guide and Feedback Report

Program/Area represented:_____

Discussion date:_____

Does anyone in this work area/group service, modify, build, repair or work on (including testing, troubleshooting, and/or voltage measurement) electrical equipment ≥ 50 V (AC) or ≥ 100V (DC), where they may be exposed to an electrical hazard (shock or arc flash)?

Examples include:
-- assembling electronics systems/equipment?
-- making or tightening electrical terminal connections with tools?
-- working around exposed energized parts that are not shielded to be "finger safe"?
-- work on grounding and bonding systems?
-- work on power entry modules or field wiring terminals?
-- modifying electrical components such as fuses, lamps, fans boards, etc.?
-- replacing critical components with new components of different ratings? [Critical components include electrical components or assemblies used in a power or safety circuit whose proper operation is essential to the safe performance of the system or circuit (e.g. fuses, circuit breakers, power wiring, transformers, heaters, motors, overloads, interlocks, emergency stops, etc.).]

Does anyone in this work area/group:
-- do work involving exposure to **batteries** (other than changing or handling batteries on unmodified commercially available equipment commonly used by the general public, in a manner intended by the manufacturer)?
-- do work which may expose them to stored energy from **capacitors**?
-- perform **switching** (opening or closing) of any electrical isolation, including operation of through-the-door breaker handles or other dead-front switching, that may expose them to a shock or arc flash hazard?

Description of Electrical Work:

_____

_____

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_____

_____

If yes or uncertain to any of the above,
-- Contact ATAP Electrical Safety Advocate (Nathan Ybarrolaza), describe the work, and request evaluation of hazard level and qualification level required for the work.

Existing & Potential Electrical Workers

-- Are the people who perform the electrical work discussed above already listed as Qualified Electrical Workers in the EHS database:
http://electricalsafety.lbl.gov/electrical-safety/qualified-electrical-worker-qew/ ?

If yes, what level of QEW authorization do they have (QEW 1, 2, 3)?
List and check status below:

People who do Electrical Work	Non-QEW*	QEW (Level, if known)
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

***If not a QEW:**
--Have they submitted an application to become a QEW?
-- Do they have questions about this process?
or
-- Does the group have ready access to a QEW who can perform this work?
-- Are there funding or scheduling concerns related to QEW support?

Feedback:

_____
_____
_____
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_____
_____

QUEST Team Leaders: Please submit completed Feedback Report to Pat Thomas.