

Multi – Division Assessment of On-the-Job Training 2019 ES&H Self-Assessment Report





Submitted By:

Operations:

Herb Toor

Herb Toor, Division Safety Coordinator, Environment Health & Safety Division

Kat Wentworth

Kat Wentworth, Safety Coordinator, Operations

Physical Sciences Area:

Patricia Thomas

Patricia Thomas, Division Safety Coordinator, Accelerator Technology and Applied Physics Division

mg

Marshall Granados, Division Safety Coordinator, Engineering Division

mg

Ingrid Peterson, Division Safety Coordinator, Physics Division

Earth and Environmental Sciences Area:

V.F.

Vivi Fissekidou, Safety Coordinator, Earth and Environmental Sciences Area, Climate and Ecosystem Science Division, Energy Geosciences Division



Approved By:

Operations:

Clara Ford for Michael Brandt

Michael Brandt, Deputy Lab Director for Operations

Jack Salazar

Jack Salazar, Division Director, Environment, Health, and Safety Division

Michelle Flynn

Michelle Flynn
Phillip Weiss, Talent and Workplace Services Manager, Office of the Chief Financial Officer

Physical Sciences Area:

James Symons

James Symons, Associate Lab Director, Physical Sciences

Th Schenkel

Thomas Schenkel, Interim Division Director, Accelerator Technology and Applied Physics Division

Henrik von der Lippe

Henrik von der Lippe, Division Director, Engineering

Natalie Roe

Natalie Roe, Division Director, Physics



Earth and Environmental Sciences Area:

Susan Hubbard

S.S. Hubbard, Associate Lab Director, Earth and Environmental Sciences

W.D. Collins

W.D. Collins, Division Director, Climate and Ecosystem Sciences

Jens Birkholzer

J.T. Birkholzer, Division Director, Energy Geosciences



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1.0 Executive Summary

The Directors of the Participating Divisions have made a commitment to Safety Stewardship, as described at: <https://stewardship.lbl.gov/leadership-of-people/safety/>. On-the-Job training (OJT) is an important part of fulfilling this commitment to ensuring Competence Commensurate with Responsibility:

- All staff receive an appropriate level of training to identify and control the hazards that they encounter in their work.
- This includes the Lab's formal EHS training. Equally important, this includes on-the-job training on the tasks that they perform and qualification by their line management.

Recent incidents have demonstrated the need for improvement in OJT. For example, in June of 2018, an LBNL worker sustained a significant cryogenic related injury during a Liquid Nitrogen filling operation. A subsequent causal analysis of the incident identified multiple contributing factors. OJT was listed as one of four Apparent Causes. The participating Divisions' Safety Coordinators observed that the application of OJT is inconsistent and varies in quality. This assessment determined how OJT is used to qualify workers to perform work under specific Work Planning and Control Activities.

Participation in the assessment provided the following benefits:

- Increased the Activity Leads' awareness of the tools available to assist them in performing and documenting OJT
- Captured examples of "best practices" to share throughout the institution, and
- Reinforced a robust Safety Culture, in which OJT is part of an ongoing conversation about safety between Activity Leads and their authorized personnel.

To improve OJT at LBNL, the assessment team recommends the following actions:

- EHS Training, with support from researchers and Subject Matter Experts, should prioritize and develop OJT support materials that have broad application and value as determined by EHS and research safety committees.
- EHS and Division Safety Coordinators should work together to determine the most effective and useful method for sharing OJT best practices as a way to help improve OJT, starting with high-hazard activities.
- The Description of Work for each Activity that requires OJT should state where the OJT information is recorded.
- The OJT button on Activity Manager should be placed outside of the drop-down menu so it is immediately visible to users.
- EHS should develop a communication plan for OJT changes.
- EHS and Division Safety Coordinators should work together to determine the best practical method for making information about training and relevant experience available to Activity Leads.



2.0 Scope

OJT is defined in EHS Manual, Chapter 24, <https://www2.lbl.gov/ehs/pub3000/CH24.html>, as: A training process used to ensure that workers are qualified to perform their specific work activities and tasks safely and effectively. It is an iterative performance-based process that involves experienced staff (activity lead, activity lead designee, or supervisor) training a less experienced worker until he or she can demonstrate, to the trainer's satisfaction, an appropriate level of understanding and mastery of the tasks.

Furthermore, OJT is defined in the *Guidance for OJT Instructors*, <https://training.lbl.gov/ehs/training/webcourses/OJT/OJTResource.pdf>, as a mixture of instruction, observation, and supervised activities used to ensure staff have the needed work-specific skills to work safely and effectively.

The following Divisions, described hereafter as the Participating Divisions, and their matrixed personnel and affiliates conducted a joint assessment of On-the-Job Training (OJT) for work activities at the LBNL site.

- LBNL Operations
 - Office of the Chief Financial Officer (OCFO)
 - Environment, Health and Safety (EHS)
- Physical Sciences Area:
 - Accelerator Technology & Applied Physics (AA)
 - Engineering (EG)
 - Physics (PH)
- Earth and Environmental Sciences Area (EESA):
 - Climate and Ecosystem Sciences (CESD)
 - Energy Geosciences (EGD)

OJT is understood to be especially critical in situations where performing a task incorrectly can lead to injury, damage expensive equipment, spoil experiments, or worse. Because OJT is not specifically required or defined for Hazard Level 1 WPC Activities, this self-assessment focuses on Hazard Level 2 and Hazard Level 3 Activities. However, all of the Divisions represented in this assessment utilize various forms of experiential learning for Hazard Level 1 workers to reinforce proactive safety attitudes, behaviors and processes for reporting issues that may range in risk level from ergonomic discomfort to electrical hazards or chemical spills. The OCFO was selected as an example because of their large population (~200) of primarily office workers.

Methodology

Methods included:



- **Document reviews:** Assessment team members reviewed Hazard Level 2 and 3 Work Planning and Control Activities to assess documentation of OJT requirements and completion. The results are summarized in Section 3.
- **Interviews:** Assessment team attempted to interview all Activity Leads for Hazard Level 3 Work Planning and Control Activities and at least 20% of Activity Leads for Hazard Level 2 Activities in each participating Division. Interviewers included the Division Safety Coordinator for the Division owning the Activity, an assessment team member from another Division, and may include a Division Safety Committee member or other assessment participant selected by the Division management.
- **Work Observations:** Activity Leads were asked whether they are willing to allow assessment team members to observe an OJT session.
- **Benchmarking:** EHS Division assessment team members contacted safety personnel at other DOE Labs and provide information on how they conduct and document OJT.

The assessment took place from January to August 2019. The assessment activities included:

- Nov. 2, 16 team meetings -- introduction and scope; Lines of Inquiry
- Dec. 10, Jan 18 team meetings -- assessment plan
- Feb. 8 team meeting -- Activity reviews
- Mar. 13 team meeting – interview planning
- April - May -- Activity Lead interviews
- Apr. 24, May 22 team meetings – review status and summarize results;
- May 31; June 11,14, 26; July 8, 24 team meetings – draft report
- August - September -- Review and approval of report



Current Requirements

The UC/DOE Prime Contract requirements for LBNL are currently being negotiated and may change during the course of this assessment. Listed below are some of the key regulations, standards, and requirements driving LBNL's OJT systems at this time:

Federal Regulations:

- 10 CFR 851.25, Worker Safety and Health Program, *Training and Information*
- 29 CFR 1910, *Occupational Safety and Health Standards*
- 10 CFR 835.103, *Occupational Radiation Protection, Education, Training and Skills*

LBNL Requirements:

- Laboratory PUB-201, *Requirements and Policies Manual*, Environment, Health and Safety (EHS) Training
- EHS Manual (Pub-3000), Chapter 24 EHS Training Program, Section 24.8 Required Work Processes, Work Process B On-the-Job Training (OJT)



3.0 Results

3.1 Lines of Inquiry For Division Safety Coordinators:

1. Do the Divisions' OJT systems meet the requirements of EHS Manual Chapter 24, Work Process B, <https://www2.lbl.gov/ehs/pub3000/CH24.html#wpB> ?

We found that Work Process B does not require a particular method of OJT. It describes the use of a **Graded Approach**, where the degree of formality and the comprehensiveness of training are graded to the overall risk. It is expected that the higher the risk, the more effort and care will be expended in ensuring that workers are appropriately qualified (competent). This is broken down as follows:

Higher Risk: Risk Level 3 hazards as defined by Work Planning and Control. **Training/qualification and OJT documentation requirements are specified** in the formal work authorizations (WPC Activities, RWAs, etc.).

Medium Risk: Risk Level 2 hazards as defined by Work Planning and Control. Training/qualification and OJT documentation requirements are driven by a blend of line management accountability and hazard assessment, where the level of qualification documentation, including OJT documentation, is **determined by division policies and/or division practices**.

Lower Risk: Risk Level 1 hazards as defined by Work Planning and Control. The method of qualification **may be informal, and OJT documentation is at the discretion of line management**.

Work Process B describes a common OJT instructional method, demonstration-performance:

Explain: The trainer first explains to the worker how to perform the task or activity safely and effectively. The critical steps are identified and differentiated from the non-critical steps. Hazards, risks, and ways to mitigate them are stressed and reinforced throughout the training.

Demonstrate: The trainer then demonstrates the task exactly the way the worker is expected to perform it. The demonstration can be repeated until the trainee has a clear picture of the action and understands how it is performed and why it is performed that way.

Perform: The worker then practices the activities and tasks under the guidance of the trainer. As the worker performs each step of the task, the trainer makes comments and corrections as required. When the worker is ready, he or she then "teaches" the operation back to the trainer. OJT is completed when the worker demonstrates, to the trainer's satisfaction, that he or she has the ability to safely perform the activities and tasks.



The Participating Divisions each looked at a selection of our WPC Activities (all Hazard Level 3, \geq 20% Hazard Level 2, and Hazard Level 1 as determined by each Division) to see whether we could determine, from the information documented in the WPC Activities:

- What OJT is required for the Activity? Where is this information contained in the Activity (Description of Work, Hazards and Controls, Training Courses)?
- Does the Activity describe who provides the OJT, and whether there are any particular qualifications for instructors?
- Does the OJT follow the demonstration-performance method, or some other method?
- Does the Activity describe how completion of OJT documented? Is the OJT documentation tool contained in Activity Manager Used?
- Is there a correlation between the Work Authorization level (Not Authorized to Work, Authorized to Work Under Direct Supervision, Authorized to Work) and Restrictions described in the Assign Workers tab of the Activity and the workers' completion of OJT?

The scope and results of the WPC Activity Reviews for each participating Area/Division are described in Appendix 5.1. The most significant thing we learned from the Activity Reviews is that because there is no standard method or requirement for documenting OJT requirements and completion in WPC Activities, the use of the various sections of the WPC Activities to document OJT varies widely. It can be difficult to quickly find information about OJT. In most cases compliance with OJT cannot be determined just by reading the Activities -- interviews with the Activity Leads were necessary.

Specifically:

- For Hazard Level 1 Activities (typically computer use in offices), OJT is not a requirement controlled within the Work Planning and Control (WPC) system. Throughout the employee life-cycle, various forms of experiential learning are used to reinforce proactive safety attitudes, behaviors and processes for reporting issues.
- The location of the OJT descriptions in the Hazard Level 2 and 3 Activities varied - they were found in the Description of Work, the OJT section, under Training Courses, Additional Controls, and/or as Standard Operating Procedures (SOPs) in the attachments.
- Most Activities did not name the OJT instructor or describe their role or qualifications.
- Most Activities did not describe the OJT sufficiently to determine the method of training.
- The OJT documentation of completion was not consistently documented in the WPC Activities. Completion notes were found in the OJT section, Assign Workers/Restrictions section, or in lab safety binders or log books, or uploaded documents. The activities with a level 3 rad hazard, had documented OJT as



required by the Radiation Protection Group. Fire protection authorizations post a list the staff authorized to perform the task.

- There was insufficient documentation in most of the Activities to determine whether OJT completion determined the work authorization level.

3.2 Lines of Inquiry For Activity Leads/Supervisors:

The scope and results of the Activity Lead/Supervisor interviews for each participating Area/Division are described in Appendix 5.2. The most significant things we learned from the interviews are summarized as follows:

1. How do you enable a new person who joins your project to work without direct supervision?

Typically, the process includes:

- Orientation - tour of work area, reading of relevant documents, completion of required training courses;
- Mentoring - Activity Lead and/or experienced co-workers demonstrate how to perform tasks, and then watch the new person perform the tasks. The mentoring process is often on-going over several months.
- Demonstration of proficiency - The new person gradually demonstrates their proficiency by performing tasks confidently and correctly, and demonstrates their understanding by being able to discuss the work and ask meaningful questions.
- Work authorization - Starting with the lowest hazard tasks, as the Activity Lead (with input from experienced co-workers) determine that the new person is able to perform tasks competently and safely, the Work Authorization level may be changed to allow the new person to perform tasks without direct supervision. For some high-hazard tasks, people will not be allowed to work alone.

2. Who provides OJT and how is it determined that they are qualified?

In most cases, the Activity Lead provides the training. The Activity Lead provides OJT for high hazard activities; the PI, scientist or a senior postdocs may also provide training.

For lower hazard activities, junior postdocs may provide OJT. Experienced co-workers also contribute through a job-shadowing process.

3. Describe how you provide OJT.

Most Activity Leads provide OJT through a mentoring process that includes the steps recommended in the EHS manual: explaining, demonstrating, and watching the person perform the tasks under supervision.

4. Do you have written instructions that describe or outline the OJT process?

A few groups have checklists or outlines of topics or tasks to be covered during OJT. Most groups use an on-going mentoring process rather than a one-time training session.

5. How is a worker's proficiency demonstrated?

In addition to demonstrating safe work practices, the new worker must also demonstrate their ability to produce high-quality work products without damaging equipment.



6. Is OJT completion documented? How is it documented?

Most Activity Leads were not aware of the OJT tracking tool available in the WPC Activities. The interview process provided an opportunity for the Division Safety Coordinators to teach the Activity Leads about this tool, and many expressed an interest in trying it.

Most of the Activity Leads that were interviewed have been documenting completion of OJT in a variety of ways: notes in the Assign Workers/Restrictions section of Activities, lab safety binders, log books, or other documents, which were sometimes uploaded or linked to the WPC Activity.

7. Is OJT a part of your Work Planning and Control work authorization process? How is OJT completion coordinated with Work Authorization level (not authorized, work under supervision, work with restrictions, work alone)? Is there a graded approach based on risk level? Please explain.

The Activity Leads control the work authorization process. Activity Leads typically use a graded approach, first training and authorizing work on low-hazard tasks. Workers are not authorized to work alone on certain defined high hazard tasks

8. Do you have any “best practices” for providing tailored OJT for non-standard workers (students, visitors, users, etc.)?

Undergraduate students require more supervision and cannot work alone, except for some very low-hazard tasks, such as data analysis.

Visitors are either excluded from working in labs, Short-term collaborators are limited to the work scope of their Subcontractor Job Hazards Analysis (SJHA) and do not work alone. (SJHA).

General Best Practices for OJT included:

- Compiling reference notebooks or Google folders containing useful information.
- Creating on-line videos.
- Sharing “Lessons Learned” stories from personal experiences.
- Explaining the concepts and goals of the Activity first, and the overall operations and hazards, before beginning task-specific OJT.
- Including the importance of housekeeping, and using the right tool for the job.

9. Do you provide and document refresher training for people returning to the Activity after an absence? Before changes to the Activity or requirements? After incidents/Lessons Learned? When work assignments/roles change?

Most groups had not experienced people returning after prolonged absences. Changes are most often communicated in group meetings, either at the beginning of the day or regular scheduled meetings.

10. How often does the team meet/communicate about routine tasks and safety concerns?

Weekly meetings were the most common. Smaller work groups typically work together and discuss issues daily in the course of doing work.



11. Have you reviewed the Guidance for OJT Instructors? Do you have any feedback on this? (Before the interview, the *Guidance for OJT Instructors* document was provided to interviewees).

Most of the Activity Leads had not reviewed the Guidance document prior to the interview. The interviews were an opportunity for the Division Safety Coordinators to remind the Activity Leads about the availability of this resource. The Activity Leads who read the Guidance document generally thought it was useful.

Comments included:

- a checklist or questionnaire format would be better.
- Encourage Activity Leads to ask the trainee follow-up questions to confirm understanding.
- It would be useful to see examples of how other Activity Leads provide OJT.
- OJT training for Activity Leads should be incorporated into the new EHS0011, *Activity Lead Training*.

12. How do you coordinate OJT for resources/equipment shared between multiple Divisions?

Most of the Lab PIs that were interviewed require that all users in their lab, regardless of home Division, are assigned to the lab/equipment activity and complete any required training.

13. Are there hazards/processes where it would be beneficial to have a standardized OJT process available from EHS?

The most frequently requested standardized training topics were:

- Cryogen handling and filling;
- Gas cylinder handling;
- Common shop equipment, such as manual mills, lathes, and bandsaws.
- The Activity Lead training should include some information on how to use the WPC system.

Several Activity Leads commented that they would like to be able to easily review the complete training records and other Activity assignments of people to know more about their knowledge and experience level.



3.3 Voluntary Work Observations of OJT:

Activity Leads were asked if they had any OJT sessions planned within the next month and whether they would be willing to demonstrate how they provide OJT.

The Division Safety Coordinators observed that the OJT being provided was consistent with the descriptions in the Activities and the interview discussions.

3.4 Benchmarking Study Summary:

Four questions were sent to NREL, BNL and ORNL to determine their OJT practices specific to research activities, as follows:

1. For general research work that may involve a range of hazards does EHS communicate expectations for OJT such as guidelines or minimum requirements? If so, how is this communicated?
2. How does an OJT trainer become qualified? Does line management /PI determine who to appoint for a given research project? Is there a formal OJT qualification process or OJT training support available?
3. Is there a requirement to document OJT and if so how is this managed?
4. Does your EHS training program provide OJT instructor support (train-the-trainer) or any type of OJT instructor qualification program? If so is this required/optional is it adding value?

Summary:

All sites responded to each question. Like LBNL, the EHS Division at (NREL) has an On-the-Job Training Guide that provides a guide for conducting effective ESH on-the-job training. Other sites did not. All sites had similar reasoning for how to determine who is qualified to provide OJT in research. The answer was line management (PI, Group lead, supervisor) determines who is qualified (in formal). The other sites did not have specific formal requirements for documenting OJT unless formally required by regulation or other internal requirements. These sites did not have a formal requirement to document OJT, unless required by regulation or internal requirement. IN most cases, the requirement and decision to document OJT was determined at the group / division level unless it their was a formal OJT documentation requirement in place.

3.5 Findings, Observations, and Noteworthy Practices:

3.5.1 Findings

A Finding (a term that is interchangeable with "Issue") refers to a programmatic or performance deficiency and/or a regulatory, policy or procedural noncompliance generally identified in a formal assessment or audit.

There were no Findings.

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3.5.2 Observations

An Observation is a practice or condition that is compliant with a regulation or requirement, but, if left unaddressed, could lead to a noncompliance.

There were 6 Observations:

| Observation | Recommended Action |
|--|--|
| <p>1. Feedback indicated that it would be very helpful to have training resources available from EHS for common tasks shared throughout the lab such as gas cylinder handling, cryogen dispensing.</p> | <p>1. EHS Training, with support from researchers and Subject Matter Experts, should prioritize and develop OJT support materials that have broad application and value as determined by EHS and research safety committees.</p> |
| <p>2. It would be beneficial for Activity Leads to share their knowledge of effective OJT practices.</p> | <p>2. EHS and Division Safety Coordinators should work together to determine the most effective and useful method for sharing OJT best-practices as a way to help improve OJT, starting with high-hazard activities.</p> |
| <p>3. There is no consistency in how OJT requirements and completion records are documented in WPC Activities. This makes OJT information difficult for workers to find, and makes it more difficult to verify compliance.</p> | <p>3. The Description of Work for each Activity that requires OJT should state where the OJT information is recorded.</p> |
| <p>4. Most Activity Leads were unaware of the OJT feature, which indicates that changes to the WPC Activity Manager system are not being communicated effectively.</p> | <p>4.1 The OJT button on Activity Manager should be placed outside of the drop-down menu so it is immediately visible to users.</p> <p>4.2. EHS should develop a communication plan for OJT changes. (Suggestions include participation in existing Lab-wide and Division events, such as Safety Fairs/Safety Days, and creating training videos.)</p> |
| <p>5. Activity Leads would like to be able to find complete information about the Training Profiles and other Activity assignments of</p> | <p>5. EHS and Division Safety Coordinators should work together to determine the best practical method for making information about</p> |



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| people before authorizing them to work on their Activities. | training and relevant experience available to Activity Leads. |
| 6. Formalize and clearly communicate the LBNL management expectations for OJT including requirements for OJT documentation. | 6. EHS0011, <i>Activity Lead Training</i> , should clearly identify the LBNL management expectations for OJT including requirements for OJT documentation. |

3.5.3 Noteworthy Practices

A Noteworthy Practice is a practice or condition that is recognized for excellence, and should be considered for Lab-wide application. There were 5 Noteworthy Practices identified:

1. One Activity Lead created **on-line training videos** of how to use his equipment.
2. Several Activity Leads developed **checklists** and/or **standardized procedures** that were used to guide OJT.
3. One Activity Lead maintains an **employee contact log** to track day-to-day discussions with his employees and the topics discussed.
4. **Sharing stories of experiences** with safety incidents and near-misses helps to encourage reporting of incidents and demonstrates the relevance of hazard controls.
5. **Start OJT with an overview** describing how the Activity contributes to the Division / Lab mission and the hazards involved in the work. This helps new workers understand why the work is important and the relevance of the applicable EHS courses and specific OJT.

3.6 Comparison to 2013 Energy Storage and Distributed Resources Self-Assessment Results:

In July 2013, the Environment and Energy Technologies Division conducted an assessment of On-the Job Training in the Energy Storage and Distributed Resources Department. The conclusions were:

1. OJT was being practiced in all of the Energy Storage and Distributed Resources department lab areas.
2. The OJT methods used varied from each lab area and were determined by each Principal Investigator.
3. There were no common OJT program guidelines available.
4. There was a need for developing OJT training materials for common equipment, experiments and hazards.
5. The Principal Investigators should continue to be given flexibility in identifying the best way of implementing OJT within their lab areas. However, OJT training



materials and training tracking processes should be developed and made available to use as needed.

These conclusions were in line with the conclusions listed in the current self-assessment report. Detailed discussion is presented in Appendix 5.5.

4.0 Conclusion

In general, the participating Divisions found that the Activity Leads are providing appropriate On-the-Job Training to the authorized personnel who work on their Activities. The most common method of OJT was on-going mentoring by the Activity Leads and experienced staff.

The documentation of the training requirements and training completion was variable and was not easy to find. Because the nature of Activities varies widely, Activity Leads should be allowed to continue to use the training and documentation methods that work best for their groups; however, their OJT systems should be described in the same place -- the Statement of Work -- in each Activity so that workers, line managers, and oversight/assurance functions can quickly find the information.

Most Activity Leads have developed their OJT systems independently. They are not aware of methods and practices being used by other Activity Leads. Most Activity Leads were not familiar with the WPC OJT recordkeeping feature or the new Guidance for OJT Instructors document. The assessment process provided an opportunity to familiarize the Activity Leads with these tools. Communication of WPC changes and available resources could be improved. Division Safety Coordinators and EHS could better support the efforts of Activity Leads by providing forums to share best practices, and by developing training materials for common hazards/controls.



5.0 Appendices

Supporting Documents

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Appendix 5.1 Summary of WPC Activity Reviews

The Participating Division Safety Coordinators looked at a selection of WPC Activities (all Hazard Level 3, \geq 20% Hazard Level 2, and Hazard Level 1 as determined by each Division) to see whether it could be determined from the information documented in the WPC Activities:

- What OJT is required for the Activity? Where is this information contained in the Activity (Description of Work, Hazards and Controls, Training Courses)?
- Does the Activity describe who provides the OJT, and whether there are any particular qualifications for instructors?
- Does the OJT follow the demonstration-performance method, or some other method?
- Does the Activity describe how completion of OJT documented? Is the OJT documentation tool contained in Activity Manager Used?
- Is there a correlation between the Work Authorization level (Not Authorized to Work, Authorized to Work Under Direct Supervision, Authorized to Work) and Restrictions described in the Assign Workers tab of the Activity and the workers' completion of OJT?

The scope and results of the WPC Activity Reviews for each participating Area/Division are as follows:

Operations:

Environment, Health and Safety Division:

EHS reviewed 29 Hazard Level 3 Activities and 29 Hazard Level 2 Activities.

OJT descriptions:

Radiological Control Technicians (RCTs), and Waste Management Technicians are qualified through extensive training as required by the DOE and Waste Permit. This qualification process involves OJT, and practicals that are very formalized and that includes job-performance-measures (JPMs) that are described and documented within these respective groups.

Because both RCTs and Waste Management Technicians undergo a very formal role-level qualification process the radiological and waste management OJT requirements within WPC are superseded by these qualifications. RPG and WMG activities communicate this by adding specific language to each of these OJT controls that explains this:

Example 1: "HWHF/Permit training and qualification program satisfies this OJT requirement"

Example 2: "RCT qualification satisfy this OJT requirement"



All other Risk-level 3 and 2 activities within EHS do not mention OJT. This is likely because EHS staff are safety professionals so are qualified by the nature of their role and experience.

Instructor qualifications:

In RPG and WMG it is the senior technician who provides the OJT. The program lead then validates that the junior tech (person becoming qualified) has the skills and competencies to perform their role.

Method of training:

When a new person joins RPG or WMG as a technician they complete their RCT qualification. They then receive on-the-job training which entails the junior person being trained by the senior person (shadowing) over a period of time. They essentially "buddy up" so that the new person learns how to perform the work in the manner expected. The new person then satisfies all of the job performance measures which are documented and evaluated. After they complete the RCT qualification, the JPMs and OJT, the senior tech or supervisor signs off on them as being qualified.

Documentation of OJT completion:

None of the EHS activities documented OJT in WPC. RCT and WMG qualifications are documented within each group as formal records. Some activities referenced OJT in the statement of work, but it was not documented in the activity or attached.

OJT/Work Authorization Level correlation:

Within RPG and WMG groups there was use of work under direct supervision for new staff who are in the progress of becoming trained and qualified. This was not specific to OJT, but a more broad justification for qualification including EHS trainings, role-qualifications (such as RCT), and OJT. In all other EHS activities we were unable to recognize a correlation between OJT and work authorization level because OJT was not documented or indicated in these activities.



Office of the Chief Financial Officer:

OCFO reviewed 1 Hazard Level 1 Activity - Computer Use Hazard

OJT descriptions:

For the Hazard Level 1 Computer Use Activity, OJT is not a requirement controlled within the Work Planning and Control (WPC) system. However, throughout the employee life-cycle, OCFO utilizes various forms of experiential learning for Hazard Level 1 workers to reinforce proactive safety attitudes, behaviors and processes for reporting issues that may range in risk level from ergonomic discomfort to electrical hazards or chemical spills.

Worker agency and participation in safety culture is reinforced through:

- Emphasis on early reporting during orientation,
- The biannual safety walkaround which ensures that the worker is still enabled (questions about ergonomics, Stop Work, protective actions, etc.), and
- Continuing education in the OCFO monthly newsletter and dedicated safety minutes at departmental meetings and the Division-wide quarterly Town Hall.

New hire orientation is as experiential as possible. New employee works through the Orientation Handbook online, accessing resources on their own with the instructor at their side. Contractors have a different departmental orientation, but the safety part is the same. Biannual safety walkthroughs are completed for all employees, contractors and student affiliates.

Instructor qualifications: All instructors are part of the Talent and Workplace Services team.

Method of training: The New Employee Orientation (NEO) instructors are trained using the EDGE method: explain, demonstrate (minimum of 1 observation), guide (minimum of 1 session with mentor shadowing), enable (on their own).

Documentation of OJT completion: Within 30 days of hire, a new employee is required to return the General New Employee Orientation Checklist [included in Appendix A]. An in person ergonomic evaluation is performed by an ergonomist or trained ergo advocate for all new employees and documented in the ergo database, but this not controlled in WPC.

OJT/Work Authorization Level correlation: All employees who are assigned only to the Hazard Level 1 Computer Use Hazard Activity are authorized to work alone upon hire.

Physical Sciences Area:

August 26, 2019

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Accelerator Technology and Applied Physics Division:

ATAP reviewed 28 Hazard Level 3 Activities and 28 Hazard Level 2 Activities.

OJT descriptions:

For Hazard Level 3 Activities, the OJT requirement was described in 24/28 Activities, although some (12/28) only described OJT for the highest hazard (laser, radiation, electrical) and most descriptions were not detailed. The location of the OJT descriptions in the Activities varied -- they were found in the Description of Work, the OJT section, under Training Courses, and/or under Additional Controls.

For Hazard Level 2 Activities, the OJT requirement was mentioned in 22/28 Activities, but about half of them (11) did not fully describe the OJT. 6/28 Activities did not require OJT. The location of the OJT descriptions varied-- they were found in the Description of Work, the OJT section, and under Training Courses.

Instructor qualifications: The instructors were named or described by role in 7/28 Hazard level 3 Activities and 5/28 Hazard Level 2 Activities.

Method of training: 2/28 Hazard Level 3 Activities and none of the Hazard Level 2 Activities described their OJT sufficiently to determine whether they are using the demonstration - performance method.

Documentation of OJT completion: 11/28 Hazard Level 3 Activities and 6/28 Hazard Level 2 Activities had some record of OJT completion. The location of the documentation varied -- they were found in the OJT section, Assign Workers/Restrictions section, uploaded documents, or it was stated that the training was documented in log books.

OJT/Work Authorization Level correlation: In most cases (19/28 Hazard Level 3 and 16/28 Hazard Level 2), there was insufficient documentation in the Activities to determine whether OJT completion determined the work authorization level. 7/28 Hazard Level 3 Activities and 6/28 Hazard Level 2 Activities contained sufficient information to verify a correlation. In 2/28 Hazard Level 3 Activities, the work authorization levels and OJT status did not appear to match.



Engineering Division:

There were 14 level 3 activities reviewed.

In Hazard Level 3 Activities, OJT requirement(s) were described in 50% of the Activities with most descriptions not very detailed. The location of the OJT descriptions in the Activities varied -- some were found in the Description of Work, others, the OJT section under Choose an Action, and the remaining one within Training Courses and/or under Additional Controls. Most notable was Activity leads not aware of the OJT tool with WPC. This helped explain why the OJT listed was populated throughout the tool

Physics Division:

Physics reviewed 32 Activities, 6 of them are Hazard Level 3 and 16 are Hazard Level 2.

OJT descriptions:

For Hazard Level 3 Activities, the OJT requirement is described in the Description of Work under Training in 6/6 Activities for the highest hazards (cryogenics, laser, radiation, electrical). The activity leads were not familiar with the OJT tool in WPC. Most preferred to use Google sheets to describe the OJT, provide check lists and keep track of the people that had OJT. It was mentioned that WPC is not user friendly reason why this is the preferred method.

For Hazard Level 2 Activities, the OJT was briefly described in Description of Work under Training in 8/15 Activities

Instructor qualifications:

Only Activity Leads provide OJT for both Hazard Level 2 and Level 3 activities.

Method of training: In all the cases the method used follows the *Guidance for OJT Instructors*.

OJT focus on critical hazards

Requires practical demonstration of how to perform the work, employee performs the work under supervision, only able to perform the work un-supervised by demonstrating proficiency.

Workers are not authorized to work alone on certain high hazard tasks.

Documentation of OJT completion: The OJT tool in WPC is not being used. The documentation of OJT completion was found in Assign Workers/Restrictions section,



uploaded documents, or it was stated that the training was documented in google sheets.

OJT/Work Authorization Level correlation: In most cases, there was insufficient documentation in the Activities to determine whether OJT completion determined the work authorization level.

Earth and Environmental Sciences Area (EESA):

The EESA safety coordinator reviewed 48 Hazard Level 3 Activities and 87 Hazard Level 2 Activities.

OJT descriptions: All Hazard Level 3 Activities (48/48) included OJT requirements. The electrical activities (3/48) require staff trained and authorized by the EHS electrical group. The activities (9/48) with rad, x-ray and laser hazards require documented OJT by the EHS RPG; OJT requirements for these activities were not detailed within the activities and listed in EHS programmatic documents. The OJT descriptions in the Activities were listed in the Description of Work, the OJT section, under Training Courses, under Additional Controls and/or as Standard Operating Procedures (SOPs) in the attachments.

The Hazard Level 2 Activities OJT documentation and descriptions were found in the Activity Description of Work, the OJT section, under Training Courses or in the attachments.

Level 2 Lab activities (28/87) require OJT in the Description of Work, the OJT section, under Training Courses, under Additional Controls and/or as Standard Operating Procedures (SOPs) in the attachments. Lab activities with a USDA Permit (3/87) require and list OJT SOPs in the attachments. Rad/sealed source/laser activities (6/87) require OJT by the EHS RPG.

Level 2 Field activities (40/87) require daily pre-job briefings, depending on the field site – site-specific orientation; work alone is not authorized. Equipment/sensor testing/field activities (7/87) do not list specific OJT. During the interviews, the activity leads indicated that most of the prep work is conducted in B64, the Geosciences Measurement Facility (GMF) before they go to the field. That work is supervised by experienced field staff familiar with the equipment/sensors. When in the field, a buddy system is employed, no work alone, and the field staff work together to set up equipment and experiments. The machine shop (1/87) work requires documented OJT and authorization for all workers, work alone is not authorized; as required by the EHS Manual, Chapter 25.

Short-term visitors are limited to the work scope of their SJHA and their work is monitored depending on the hazard level.



Instructor qualifications: The instructors were named or described by role in 2/48 Hazard level 3 Activities and in 3/87 Hazard Level 2 Activities.

Method of training: None of the WPC Activities described their OJT process sufficiently to determine the method used. The activity leads manage OJT, mainly by explaining to new employees how to perform the work, supervising and evaluating employee's work performance, and allowing unsupervised work after the new employee demonstrated proficiency. A number of Activities have SOPs and equipment manuals attached.

Documentation of OJT completion: The OJT documentation of completion was not consistently documented in the WPC activity.

Completion notes were found in the OJT section, Assign Workers/Restrictions section, or in lab safety binders. The activities with a level 3 rad hazard, had documented OJT required by the RPG. Fire protection authorizations post a list the staff authorized to perform the task. Lab OJT records can be found in Lab notebooks, lab primers, or log sheets.

OJT/Work Authorization Level correlation: In most activities there was insufficient documentation in the Activities to determine whether OJT completion determined the work authorization level.

During the interviews with the activity leads, it was clearly stated that OJT is an integral part of the EESA lab/field operations and it is strongly linked to the quality of the science and protection of the lab equipment. Independent of the EHS requirements, the activity leads will not allow new staff to work on processes or equipment without proper on the job training; OJT is a standard practice for EESA work.



5.2 Summary of Interview Responses

Operations:

Environment, Health and Safety Division:

1. How do you enable a new person who joins your project to work without direct supervision?

Before work is performed, new employees must read the procedures and WPC Activity. The Activity is then reviewed as a team before an experienced employee performs the task while the new employee observes. The new employee then performs the task under direct supervision. Once the employee demonstrates how to perform the task well, the Activity Lead signs off. For the rest of the team, who have performed the task, it functions as a refresher.

2. Who provides OJT and how is it determined that they are qualified?

The senior tech provides the OJT. The Program lead then validates that the junior tech has the skills and competencies needed for their role.

3. Describe how you provide OJT.

It is a hands-on process. I show how to perform the task and then I verify performance or Job performance measures. This can involve creating a scenario as a way to set up a performance situations and a way to evaluate the performance.

4. Do you have written instructions that describe or outline the OJT process?

There is a standardized outline of the objectives, the materials and equipment needed and the criteria for successful performance.

5. How is a worker's proficiency demonstrated?

The worker demonstrates proficiency by performing the work and tasks correctly, and with observation by the OJT instructor who will qualify them. The proficiency (Performance criteria) is written out in a form that consists of knowledge and performance criteria as a way to evaluate performance consistently.

6. Is OJT completion documented? How is it documented?

Yes - Documented locally as part of RCT qualifications, and OJT specific to the activity is documented in WPC activities as an attachment. (Both the person providing the OJT and the employee receiving the OJT sign a form that documents the OJT).

WMG - Yes - The employee signs and dates the procedure and employee signs and dates OJT. Currently, OJT documentation is not uploaded into WPC (for one group).

7. Is OJT a part of your Work Planning and Control work authorization process? How is OJT completion coordinated with Work Authorization level (not authorized, work under supervision, work with restrictions, work alone)? Is there a graded approach based on risk level? Please explain.

Yes - as an example, the RCT position qualifies the employee to work on various Activities that might require the use of a survey meter.

Yes - It is explained in the Statement of Work and attached to the activity.



In the Waste Facility staff work in pairs (Buddy system)

RPG: An OJT note is often included in the WPC Activity as to the level of authorization an employee has under that Activity

Yes, (based on the severity of the hazard) but not formalized.

No. Any and all mistakes are a risk because it could cause contamination or spills, etc.

Yes and No. OJT is used at all levels to ensure worker meets procedures. I will also indicate in the Authorization Level "Pending OJT" before moving to work without supervision.

The greater the risk, the greater the level of review. "Review it before you do it."

8. Do you have any "best practices" for providing tailored OJT for non-standard workers (students, visitors, users, etc.)?

No

No

NA

Yes - they have contractors that perform work in their areas. Before that work happens, they meet with the contractor in the conference room to discuss the work. What is being done and where it is being done. There is a pre-job discussion and contractors are escorted while in the facility.

9. Do you provide and document refresher training for people returning to the Activity after an absence? Before changes to the Activity or requirements? After incidents/Lessons Learned? When work assignments/roles change?

After an absence?

For radiological and RCT work you need to re-qualify every two years, so this is a standard component of the program. (RCTs go through continuous training and need to take an exam to maintain certification. WM techs take knowledge based courses and DOT training).

NA (this situation has not come up)

NA. To remain qualified as an RCT there is a continuous training program and recertification every two years.

The whole team reviews the Activity and Procedures

Before changes to the Activity or requirements?

Nothing formal

Yes, if there is new equipment as an example.

Yes



After incidents/Lessons Learned?

Nothing formal

Hasn't occurred yet, but yes.

Yes. These are discussed as part of regular weekly meetings when there is one that is applicable.

Yes

When work assignments/roles change?

Nothing formal

Work assignments tend not to change and there is only one way to perform a survey.

Yes

10. How often does the team meet/communicate about routine tasks and safety concerns?

Activity Leads reported weekly meetings "that involve open discussion, lessons learned, what the team will do that week and what the team could do better."

11. (Before the interview, the *Guidance for OJT Instructors* document was provided to interviewees). Have you reviewed the *Guidance for OJT Instructors*? Do you have any feedback on this?

Most of the Activity Leads interviewed had not reviewed the OJT Guidance document. One Activity Lead felt the guidance document should include job performance measures. However, he did not think there was institutional policy in place to support it and commented that there was little or no discussion about proficiency exams in the document.

12. How do you coordinate OJT for resources/equipment shared between multiple Divisions?

This was not applicable for the EHS Activity Leads that were interviewed.

13. Are there hazards/processes where it would be beneficial to have a standardized OJT process available from EHS?

Two Activity Leads felt that a standardized OJT process for certain Activities would be advantageous. Examples given included things that are routine or repeated practices or use of equipment (such as cryo fills, pressure safety, etc.).



Office of the Chief Financial Officer:

Summarized in Appendix 5.1 above.



Physical Sciences Area:

Accelerator Technology and Applied Physics Division:

ATAP interviewed 19 Activity Leads (including 4 matrixed from Engineering Division). Following is a summary of their responses to our Lines of Inquiry.

1. How do you enable a new person who joins your project to work without direct supervision?

The OJT process described in paragraph 4 below is followed until the trainee demonstrates that he/she can perform the task safely, confidently, consistently, and with satisfactory work results. Experienced co-workers are asked for their opinion about which tasks the trainee can be trusted to perform. The trainee has to understand the terminology well enough to ask questions and discuss issues - there can be language barriers.

2. Who provides OJT and how is it determined that they are qualified?

Most ATAP Activities are performed by small groups and the Activity Lead provides the OJT. For larger projects, such as BELLA, the Activity Lead may designate senior personnel who can provide training for certain areas or tasks. Experienced co-workers contribute to the on-going mentoring process.

3. Describe how you provide OJT.

For most Activity Leads, OJT is an on-going mentoring process that occurs over several months rather than a one-time training session. The amount of mentoring needed depends on the level of experience of the new person. The process includes a combination of:

- Background - the trainer describes the overall project, activity, and the trainee's role; they tour the work site and discuss equipment and hazards
- Instructions - the trainer reviews WPC, procedures, and work instructions with the trainee
- Job shadowing - the trainee observes the work of an experienced person
- Demonstration - the trainer demonstrates and explains the work to the trainee, one task at a time.
- Performance - the trainee attempts the task with the trainer observing. This process involves interaction, pausing work and asking questions until the trainee understands the task.

Trainees are introduced to low-hazard tasks first. They learn tasks one by one "like building a tool box" of knowledge and skills.

4. Do you have written instructions that describe or outline the OJT process?

The level of formality varies depending on the hazard type and the size of the research group. The larger groups, such as BELLA, and higher hazards (laser, radiation, electrical work) typically have checklists that outline the information to be covered in the OJT. The smaller research groups rely on one-on-one interaction between the Activity Lead and trainee.



5. How is a worker's proficiency demonstrated?

Workers demonstrate proficiency first by asking questions that indicate they understand the work and hazards, then by performing the work with confidence. They must fully understand what they are doing, not just the safety rules, and show that they can make good decisions. The trainer observes the work and reviews the quality of the work products.

6. Is OJT completion documented? How is it documented?

The most common method of recording OJT was to make notations under the Assign Workers / Restrictions feature of WPC.

Some of the larger groups have their own documentation systems, such as Google docs shared files.

Most Activity Leads were not yet aware of the OJT tool hidden under the "Choose an Action" tab of each WPC Activity. The interview process was an opportunity to introduce the Activity Leads to this feature, and most of them expressed an interest in trying it.

7. Is OJT a part of your Work Planning and Control work authorization process? How is OJT completion coordinated with Work Authorization level (not authorized, work under supervision, work with restrictions, work alone)? Is there a graded approach based on risk level? Please explain.

People who enter work areas to perform limited tasks, such as custodians, receive a tailored briefing.

Students typically start with low-hazard work, such as data analysis.

Short-term collaborators are limited to the work scope of their SJHA and do not work alone.

BELLA links OJT completion to lab and interlock card key access.

Work is typically authorized task by task, e.g., laser operation before alignment.

Some high-hazard work, such as electrical work, is not allowed to be performed alone.

8. Do you have any "best practices" for providing tailored OJT for non-standard workers (students, visitors, users, etc.)?

Some Activity Leads have compiled reference notebooks or Google folders containing procedures, manufacturer's guides, detailed how-to guides, and other useful information.

One Activity Lead created on-line videos to show how to perform certain tasks.

Sharing stories from personal experiences can be valuable. It creates a safe environment for the trainee to ask questions and report issues.

Explain the concepts and goals of the Activity first, and the overall operations and hazards. This helps the trainee understand why the training is important.

9. Do you provide and document refresher training for people returning to the Activity after an absence? Before changes to the Activity or requirements? After incidents/Lessons Learned? When work assignments/roles change?

Most Activities have not experienced workers who return after prolonged absences.



Changes in hazards and controls are communicated in group meetings and daily interactions, as described in paragraph 11 below. Changes are also communicated by email when people are working in different locations.

10. How often does the team meet/communicate about routine tasks and safety concerns?

Typically, informal meetings at the beginning and/or end of each work day. Group meetings on a weekly to monthly frequency. Most small research groups have daily interactions between the Activity Lead and workers.

11. (Before the interview, the *Guidance for OJT Instructors* document was provided to interviewees). Have you reviewed the *Guidance for OJT Instructors*? Do you have any feedback on this?

Most of the Activity Leads had not reviewed the guidance document. The interviews were an opportunity to call their attention to it. Most Activity Leads that had read the document found it helpful. One person suggested that a checklist or questionnaire format would be better. Encourage Activity Leads to ask the trainee follow-up questions to confirm understanding. It would be useful to see examples of how other Activity Leads provide OJT.

12. How do you coordinate OJT for resources/equipment shared between multiple Divisions?

The owner of the equipment or instrument controls access. This may become a larger issue as ATAP gets involved in more collaborations with other Divisions.

13. Are there hazards/processes where it would be beneficial to have a standardized OJT process available from EHS?

Common shop equipment, such as manual mills, lathes, and bandsaws.

The Activity Lead training should include some information on how to use the WPC system.

Lasernet and Pelletron

Activity Leads would like to be able to easily review the complete training records and other Activity assignments of people to know more about their knowledge and experience level.



Other comments from Activity Leads:

Sometimes new people don't realize that common tasks like climbing ladders and soldering have hazards and require training. (The old JHA questionnaire did a better job of prompting people to identify these hazards and training needs.)

There are two other important points that aren't usually taught in classes.

1. Housekeeping. It's important to put things away after you're finished - it changes the whole mindset into a place where people care about their environment.

2. "Use the right tool for the job." This is extremely important, since there's such a temptation to use what's available, rather than taking the extra five minutes to get the right tool. I think so many accidents occur because of the failure to pay attention to this simple rule.



Engineering Division:

- 1. How do you enable a new person who joins your project to work without direct supervision?** Start by establishing a baseline training then Mentoring with an experienced person. After the new staff has demonstrated the necessary skill set, then they are allowed to work alone.
- 2. Who provides OJT and how is it determined that they are qualified?** It is a combination of the Activity lead and experienced co-workers who have the new staff perform one task at a time and observe and adjust as needed on the spot
- 3. Describe how you provide OJT.** There are three main ways. Mentoring one on one. Mentoring with established checklist/work instruction. Shadow the experience worker
- 4. Do you have written instructions that describe or outline the OJT process?** Some of the OJT approaches rely heavily on written procedures while a few were verbal only
- 5. How is a worker's proficiency demonstrated?** Most common way found was by direct observation
- 6. Is OJT completion documented? How is it documented?** Yes, in a variety of ways. Some by using the written procedure and other by using the work authorization tool within the WPC
- 7. Is OJT a part of your Work Planning and Control work authorization process? When utilized, yes, it is used to change authorization levels. How is OJT completion coordinated with Work Authorization level (not authorized, work under supervision, work with restrictions, work alone)? Is there a graded approach based on risk level? Yes Please explain.** As the adoption of the OJT tool increases, we will be better able to discern its applications
- 8. Do you have any "best practices" for providing tailored OJT for non-standard workers (students, visitors, users, etc.)?** The use of checklists, standardized procedures, and contact logbooks were seen as best practices. A notable best practice was the use of sharing stories about "A guy I knew once did this"
- 9. Do you provide and document refresher training for people returning to the Activity after an absence? Before changes to the Activity or requirements? After incidents/Lessons Learned? When work assignments/roles change?** Yes, requalifying is required for the higher hazard task. Weekly meetings were also mentioned in some of the activities as a means of keeping new changes to the risk envelope known.
- 10. How often does the team meet/communicate about routine tasks and safety concerns?** In some cases, daily briefings for smaller teams and weekly for more complex operations
- 11. (Before the interview, the *Guidance for OJT Instructors* document was provided to interviewees). Have you reviewed the *Guidance for OJT Instructors*? Do you have any feedback on this?** No



12. How do you coordinate OJT for resources/equipment shared between multiple Divisions? Direct supervision of 'User Shop' is the only area where we allow shared equipment.

13. Are there hazards/processes where it would be beneficial to have a standardized OJT process available from EHS? Yes, as we continue to understand the various ways in which our staff teaches each other, parts and pieces can be gleaned and copied for use by other like activities. i.e. vacuum system where a standardized bake-out is well established within the field. Also, cryogen dispensing could benefit from known approaches.



Physics Division:

1. How do you enable a new person who joins your project to work without direct supervision?

Process - a person comes in, discuss work plan covering tasks involved, do a lab tour. During the Lab tour the Activity is described such as the specific tasks and activities associated with the Activity. Employee then goes through WPC training before coming back to the Lab. At this time, the different steps associated with the activity are reviewed. The OJT instructor goes through the procedures, the new person watches and then the new person performs the procedure and the OJT instructor watches. The decision to let the person work alone is based on this.

Share a folder in google drive, it contains information on the entire lab. Under this folder is a subfolder which contains the procedures, hazards associated with the different procedures, etc.

WPC OJT is not used since the system is slow and clunky.

Safety is everyone's responsibility. The culture at UCB is more about succeeding rather than safety. Fear of admitting that they don't know how to do things and ask questions.

Need to make sure people are properly trained. We are continually doing OJT, always transferring the knowledge.

2. Who provides OJT and how is it determined that they are qualified?

The Activity Lead provides OJT for high hazard activities; PI, senior scientist or a senior post-doc

For lower hazard activities, junior post-docs provide OJT

3. Describe how you provide OJT.

See #2 above

4. Do you have written instructions that describe or outline the OJT process?

Have written procedures, checklists for high hazard and critical tasks

For simpler operations no written instructions

5. How is a worker's proficiency demonstrated?

See #2 above

Demonstrate on how to perform the work in the activity to the new employee, watch the employee perform the activity under supervision. They have to be able to perform the work without thinking about it.

Observe the employee performing the work, look for display of confidence.

6. Is OJT completion documented? How is it documented?



Started using the OJT tool recently. They were not aware of the tool in WPC.

Authorized to work only after completed all training.

Historically this has been documented informally. Will be using the OJT tool in WPC

7. Is OJT a part of your Work Planning and Control work authorization process? How is OJT completion coordinated with Work Authorization level (not authorized, work under supervision, work with restrictions, work alone)? Is there a graded approach based on risk level? Please explain.

PI knows everyone that completed all work and who is authorized. The following is emphasized: If you cannot operate something, do not touch it.

Workers are not authorized to work alone on certain defined high hazard tasks

PI manages authorization level

8. Do you have any "best practices" for providing tailored OJT for non-standard workers (students, visitors, users, etc.)?

Same as item #4

Undergraduate students require more supervision and cannot work alone.

Visitors do not work in the Lab and are not allowed to touch anything.

9. Do you provide and document refresher training for people returning to the Activity after an absence? Before changes to the Activity or requirements? After incidents/Lessons Learned? When work assignments/roles change?

Not applicable for most but it might change.

10. How often does the team meet/communicate about routine tasks and safety concerns?

Discuss with the team if procedures change

No specific Safety Meetings. Communicate during group meetings and discuss safety. Also over lunch.

Group meetings

Frequently. The group has lunch together everyday

11. (Before the interview, the *Guidance for OJT Instructors* document was provided to interviewees). Have you reviewed the *Guidance for OJT Instructors*? Do you have any feedback on this?

Yes and it describes basically what we do. Particularly how the training is performed.

The document read well and the suggestions are reasonable

It is useful and it describes what we do.

12. How do you coordinate OJT for resources/equipment shared between multiple Divisions? N/A

13. Are there hazards/processes where it would be beneficial to have a standardized OJT process available from EHS?



Handling cryogens such as Liquid Nitrogen

Compressed gases

LN2 fill, replacing and moving gas cylinders.

Safety class on how to work with hand tools

High Voltage, 100Kev/low current training. None available online at LBNL



Earth and Environmental Sciences Area:

EESA interviewed 15/47 Activity Leads for level 3 and 2 hazards. Following is a summary of their responses to the Lines of Inquiry.

1. How do you enable a new person who joins your project to work without direct supervision?

The new staff are instructed how to perform the task and work under supervision until they demonstrate that they can perform the task safely. Use of high Pressure systems and other equipment is closely monitored until staff know how to operate them. The SOPs and equipment manuals are readily available in the lab for review.

2. Who provides OJT and how is it determined that they are qualified?

The Lab PI, the Activity Lead, and experienced lab staff provide the OJT and oversee equipment operation.

3. Describe how you provide OJT.

For most Activity Leads, OJT is an on-going process that occurs over a period of time. The groups are usually small and there is continuous interaction among the group members. The OJT depends on the level of experience of the new staff. The process includes:

- description of the overall project, activity, roles, work site and discussion equipment and hazards
- review of applicable WPC, procedures, and work instructions
- explanation of the work, one task at a time.
- observation until competency is achieved.

4. Do you have written instructions that describe or outline the OJT process?

All groups rely on one-on-one interaction between the Activity Lead/lab staff and trainee. SOPs are attached to the WPC activity. Field activities require a daily briefing. Work in the machine shop is authorized upon completion of one-to-one OJT and it is for specific instruments.

5. How is a worker's proficiency demonstrated?

The trainer observes the work for a period, depending on the complexity of the task and reviews work products.

6. Is OJT completion documented? How is it documented?

The most common method of recording OJT was to make notations under the Assign Workers / Restrictions feature of WPC.

Most Activity Leads were not yet aware of the OJT tool hidden under the "Choose an Action" tab of each WPC Activity. The interview process was an opportunity to introduce the Activity Leads to this feature, and most of them expressed an interest in trying it.

7. Is OJT a part of your Work Planning and Control work authorization process? How is OJT completion coordinated with Work Authorization level (not authorized,



work under supervision, work with restrictions, work alone)? Is there a graded approach based on risk level? Please explain.

Short-term collaborators are limited to the work scope of their SJHA and do not work alone.

Students typically start with low-hazard work, and cannot work alone in the lab after hours or weekends.

Work in the machine shop is not allowed to be performed alone.

8. Do you have any “best practices” for providing tailored OJT for non-standard workers (students, visitors, users, etc.)?

Some Activity Leads have hardcopy or electronic Lab Primers containing procedures, manufacturer’s guides, detailed how-to guides, and other useful information.

9. Do you provide and document refresher training for people returning to the Activity after an absence? Before changes to the Activity or requirements? After incidents/Lessons Learned? When work assignments/roles change?

Changes in hazards and controls are communicated in group meetings and daily interactions. Updates to an activity are communicated to all users. Incidents and Lessons Learned are communicated by the EESA DSC to the monthly department meetings, lab safety meetings, EESA safety committee.

10. How often does the team meet/communicate about routine tasks and safety concerns?

Most labs hold weekly lab group meetings. For Lab PIs working at UCB, an onsite EESA staff is assigned as the activity lead designee to support the work.

Field work requires daily pre-job meeting

11. (Before the interview, the *Guidance for OJT Instructors* document was provided to interviewees). Have you reviewed the *Guidance for OJT Instructors*? Do you have any feedback on this?

Most of the Activity Leads had not reviewed the guidance document. The interviews were an opportunity to call their attention to it. OJT training for activity leads should be incorporated into the new EHS0011, *Activity Lead Training*.

12. How do you coordinate OJT for resources/equipment shared between multiple Divisions?

The Lab PIs require that all users in their lab are assigned to the lab/equipment activity and complete any required training.

13. Are there hazards/processes where it would be beneficial to have a standardized OJT process available from EHS?

Activity Leads would like to be able to easily review the complete training records and other Activity assignments of people to know more about their knowledge and experience level.

Other comments from EESA Activity Leads:



EESA Lab PIs and staff are diligent in ensuring that new staff, affiliates and guests are not allowed to perform work and/or operate equipment until they are proficient; any damage to the equipment would affect data acquisition, delay project schedule and deliverables, and incur costly equipment repairs.

The WPC OJT updates were not clearly introduced to the activity leads. OJT is listed both under (i) "Choose an Action" tab and (ii) the "training courses" tab. The OJT in the "training courses" tab is associated with activity specific hazards. It is not clear if the activity lead should prepare an OJT for those hazards; it was suggested that EHS provides some videos to address the OJT for these wpc specific hazards.

EHS0011, *Activity Lead Training*, should clearly identify the LBNL management expectations for OJT including requirements for OJT documentation.



5.3 Benchmarking Study Responses

Four questions were sent to NREL, BNL and ORNL to determine their OJT practices specific to research activities, as follows:

1. For general research work that may involve a range of hazards does EHS communicate expectations for OJT such as guidelines or minimum requirements? If so, how is this communicated?
2. How does an OJT trainer become qualified? Does line management /PI determine who to appoint for a given research project? Is there a formal OJT qualification process or OJT training support available?
3. Is there a requirement to document OJT and if so how is this managed?
4. Does your EHS training program provide OJT instructor support (train-the-trainer) or any type of OJT instructor qualification program? If so is this required/optional is it adding value?

NREL Response:

1. We don't have a specific OJT requirement in ESH. It is implemented from a general guideline perspective. Here are a couple of excerpts from our Training LLP:

2.5 Environment, Safety, and Health On-the-Job Training. ESH on-the-job training may be required for new workers to operate equipment or conduct activities safely. This training may be required by an SOP, equipment manual, or similar requirements. A qualified and authorized worker must conduct ESH on-the-job training. The Environment, Safety, and Health On-the-Job Training Guide provides a guide for conducting effective ESH on-the-job training. To establish a record of this training, send documentation of on-the-job training to the Human Resources Office (mail stop RSF024). The training record is kept with the employee's training file.

2.6 Environment, Safety, and Health Mentorship. NREL provides foundational information to new workers through orientation and training. However, true understanding of processes and practices is most effectively learned through ESH mentorship. The line manager may assign one or more mentors to guide and indoctrinate the new worker and serve as a resource to answer his or her questions. The Environment, Safety, and Health Mentorship Guide provides a basic guide to ESH mentorship.

That being said, programs like LOTO have a very specific practical that can be deemed as OJT and is tracked as part of the employees required training plan.



2. We don't have official OJT trainers. At the directorate level, such as the Wind Site, there is qualification training process for employees to ensure that have received the proper training/indoctrination. They manage that process.
3. We don't have an ESH requirement associated with OJT training processes.
4. No, we don't directly support the OJT effort at this time.

ORNL Response:

1. The OSHA lab standard requires site-specific training on the hazards in the lab, which is communicated in the ORNL Chemical Hygiene Plan, which is required reading to work in the labs. OJT is generally conducted by the PI, LSM, or a lab co-worker with expertise in the process involved.
2. There is not a formal qualification. The expectation for meaningful training is set by the SCoR principles as implemented by the group leader. The breadth of site-specific knowledge required is too broad for any one person to be competent to teach.
3. Different divisions and groups use different tracking methods. In certain buildings, researchers cannot get prox card access to the lab until they complete one-on-one site specific training with the PI or LSM.
4. Not that I am aware of. I've worked in academic and research labs for over 2 decades, and I am skeptical that an institutional OJT instructor qualification program would add value. If a lab mentor lacks the requisite expertise or attitude to provide good training, it's unlikely that an EHS or training consultant would know (because it's not their area of expertise). My instinct is that adding a requirement for OJT instructor training creates an administrative burden with low effectiveness to improve OJT training quality. I think the emphasis should be on the group leader to promote and disseminate SCoR principles ...the group leader appoints the person to the role of OJT trainer, they have the expertise to assess that person's competence, and they have the authority to change the roles if there is a need. Caveat: The LOSA training is optional, but it seems to be very effective at reinforcing safety implementation, based on the actions of the people I have worked with that have been through the training.



Brookhaven Response:

1. Brookhaven's Training & Qualifications (TQ) Program Office, in cooperation with ESH Subject Matter Experts, evaluates all federal, state and industry regulations and requirements (DOE, DOT, EPA, etc.) to determine the training and qualifications necessary for staff to perform work safely and compliantly. We use a graded approach to determine the best format for training (classroom, OJT, online, or blended) and frequency of retraining. These training requirements are grouped by role, facility, and hazard, then linked to the appropriate staff to complete. Staff are expected to work with their supervisor to ensure they complete training and qualifications prior to work, and to review training requirements on a regular basis to ensure they are current. Training requirements, staff completions, and training history are maintained in the Brookhaven Training Management System, which serves as the official record for all training at Brookhaven.
2. For EHS topics (Forklift, Cranes, etc) anyone who will be conducting OJTs must complete the requisite training on equipment, program and processes and be qualified to perform the work for which they will be evaluating others. Their department submits the nominated staff's name to the TQ Program Office, which then evaluates and confirms the staff to be a Field Evaluator. The Field Evaluator must maintain their own training and qualifications in order to remain a Field Evaluator. For research work, (lab-based OJT) that the PI or research lead performs OJT to staff based on their appraisal of what is needed, and TQ is not involved in qualifying or reviewing this level of OJT
3. Brookhaven tracks all training and qualifications (including OJTs for EHS topics – not research OJT) in the Brookhaven Training Management System. When staff training is due for renewal, the system automatically sends out reminders at 30, 10 and 3 days prior to expiration.
4. Brookhaven offers a few Train-the-Trainer courses for Field Evaluators and other facilitators onsite. We are currently evaluating outside vendor training to continue to supplement and improve our instructor qualification program.



Appendix 5.4

OCFO General New Employee Orientation Checklist

The Office of the CFO welcomes you! To help you get started quickly and efficiently, this checklist is designed to give you a listing of tasks, training courses and other responsibilities including the resource for information or training you are to receive. Your supervisor will go over this list with you and your progress during your first 30 days of employment. If you have any questions regarding any of the knowledge areas or tasks, please ask them of your supervisor. All links listed can be accessed from the Laboratory's main website: www.lbl.gov and most can be found by using the A-Z index located on the Laboratory home page.

On Start Day

| Done | Knowledge Area/Task | Resource |
|------|---|---|
| | Get tour of working area and desk location | Supervisor or designee |
| | Participate in HR Orientation | Berkeley Lab HR Service Center, hrsc.lbl.gov , 510-486-4772, Building 65 |
| | Obtain parking pass and confirm available parking areas | Take Berkeley Lab Shuttle to Building 65A. Schedule and routes are found at: www.lbl.gov . Find the A-Z index on the home page, click on the "S" and find "Shuttle Bus Services." You will want the <u>Blue</u> route. Find parking information by using the A-Z index, click on the "P" and find "Parking at Berkeley Lab" for parking information and maps. |
| | Obtain Employee ID and temporary LDAP password from Bldg 65A | Take the Berkeley Lab Shuttle to Bldg 65A. Schedule and routes are found at: www.lbl.gov , find the A-Z index on the home page, click on the "S" and find "Shuttle Bus Services." You will want the <u>Blue</u> route. |
| | Take the GERT online training (EHS0405) | Visit training.lbl.gov to take this course. |
| | Familiarize self with new computer/laptop which should be set up at workstation | Contact Computer Help Desk (x4357) or David Huynh (x2868) for assistance |



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| | Create personalized LDAP Password | Use instruction sheet given to you at Bldg 65A after you have received your security badge. This LDAP password will be needed for nearly all Laboratory system access to be sure that it is a password you will readily remember. |
| | Obtain phone number, voicemail User Guide and record voicemail greeting, name and create security code. | See your supervisor or department administrator for your phone number as it must be arranged for you. Call Telephone Services (x7997) for other assistance. |
| | Familiarize self with email system (http://gmail.lbl.gov) | Find information about your Berkeley Lab email at www.lbl.gov . Use the A-Z index and click on "Email FAQ." |
| | Learn how to use calendaring system (http://gcal.lbl.gov/) | Find information about your Google Calendar at www.lbl.gov . Use the A-Z index and click on "Calendaring FAQ." |
| | Obtain readily available office supplies as needed from supply cabinet/room | Administrator |
| | Have Portrait Taken | Contact your Administrator if this was not done during your OCFO orientation. |

General New Employee Orientation Checklist

Within first 30 days

| Done | Knowledge Area/Task | Resource |
|------|---|---|
| | Accept Activity Authorization via the email sent to you from the Work Planning and Controls (WPC) system. | Link to Work Planning and Controls system: http://wpc.lbl.gov/ |
| | Contact Division Property Representative to take custodianship of all Lab-provided equipment | Link to Property Reps is found here . |
| | Update Employee Directory | Link to Berkeley Lab Phonebook: https://identity.lbl.gov/IdentitySelfService2/edit.jsp |



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|--|---|--|
| | <p>Complete New Employee Orientation and Required Training Courses to include:</p> <ul style="list-style-type: none"> ● New Employee Briefing - Online ● Safety, Emergency Preparedness and Trafficking Persons (LBL0110) - Online ● Computer Security Training (SEC0201) –Online ● Take the Personally Identifiable Information and Information Security Training Course (SEC0220) ● Workplace Substance Abuse Training – Online ● Complete EHS0059 – Ergo Self-Assessment for Computer Users ● Notice of External Monitoring (SEC0203) ● PSD0135 – General Emergency Management Awareness | <p>Link to courses can be found at: www.lbl.gov, find the Index on the home page, click on the “T” and find “Training.” Click on the “Training Courses” link to see the listing of courses. Some of these courses are online, some are classroom.</p> |
| | <p>Sign up and complete all required courses listed in the Berkeley Lab training database at training.lbl.gov</p> | <p>Link to the training site can be found at www.lbl.gov, find the A-Z index on the home page, click on the “T” and find “Training.” Then click on “Login.”</p> |
| | <p>Complete Ergonomic Review (personal interview scheduled with divisional safety representative)</p> | <p>Division Safety Representative: Kat Wentworth HKWentworth@lbl.gov, x 7854</p> |
| | <p>Complete Employee Benefits Enrollment</p> | <p>Link to this can be found at www.lbl.gov, find the A-Z index on the home page, click on the “B” and find “Benefits.” Once you get to the Berkeley Lab Benefits home page, you'll want to select the link on the page called “UC Human Resources Website, At Your Service.” Here is the direct link: http://atyourservice.ucop.edu/</p> <p>A video and documentation outlining benefits can be found at this link: http://ucnet.universityofcalifornia.edu/compensation-and-benefits/benefits-of-belonging.html</p> |
| | <p>Meet OCFO Human Resources Liaison</p> | <p>Alex Degg, 510-486-4070, Room 205 in B971</p> |



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| Learn how to use LETS for timekeeping (type "LETS" into address bar to access) | Visit training.lbl.gov and select Course Number FMS1500 LETS Entry Training. |
| Review position description and set 30/60/90 day goals with supervisor as applicable | Supervisor |

| | |
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| View the Berkeley Lab Ethical Values and Conduct website | Link to site can be found in the A-Z Index under Ethics and Values |
| Complete the following Laboratory and Financial Introduction courses (online): <ul style="list-style-type: none"> ● Contract 31 Overview ● Major Financial Roles and Responsibilities at LBNL ● LBNL Funds Control ● Cost Allowability | All of these courses are part of the full Core Financial Management Program. They are found on the Lab Training Website here: training.lbl.gov . |
| Sign up for Berkeley Lab Emergency Alert Service | Link to site can be found in A-Z index under "LabAlert." |
| Obtain necessary Financial Management Systems (FMS) access | See https://commons.lbl.gov/display/ocfobs/Sys+tem+Access for a list of contact points for specific systems access. |
| Download/purchase needed software based on supervisor approval | Link to software available for download can be found at www.lbl.gov , find the A-Z index on the home page, click on the "S" and find "Software Licensing and Download." Obtain Project and Activity ID(s) from supervisor for chargeable software. |
| View eBay and order supplies as needed (if authorized by supervisor) | Link to eBay can be found at www.lbl.gov , find the A-Z index on the home page, click on the "E" and find "eBuy." |
| Learn building emergency evacuation procedures | Supervisor or Building Emergency Team member (names found on Emergency notice by work area exit doors) |
| Complete online travel reimbursement and policy training if needed (ask supervisor) | Link to Travel Office website can be found at www.lbl.gov , find the A-Z index on the home page, click on the "T" and find "Travel Office." On the Travel Office home page, find the link called "Training" and |



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| | | review information listed there. |
| | Obtain office desk keys | Administrator |
| | View Lab Commons Wiki Site | https://commons.lbl.gov/ |
| | View OCFO Intranet and update People Page | https://intranet.lbl.gov/ocfo |
| | Familiarize yourself with the Lab's communication platform, Elements | Elements.lbl.gov |
| | Make sure your contact information is up-to-date in the Lab's phone directory. | Phonebook.lbl.gov |

New Employee: I've received the appropriate orientation information to enable me to make a smooth transition to the Berkeley Lab and my new role.

 Name Date

Supervisor: I've provided my new staff member the necessary information to enable him/her to make the necessary and comfortable transition into the Berkeley Lab and his/her role.

 Name Date



Appendix 5.5

Comparison to 2013 Energy Storage and Distributed Resources Self-Assessment Results

| 2018 ESDR Recommendations | 2019 Status, LBNL-wide |
|--|---|
| <p>Review training section of Activity Hazard Documents during review/update to better describe all OJT methods employed, including a description of any additional OJT not required by the AHD. Any OJT training documentation can be uploaded directly into the AHD.</p> | <p>AHDs have been replaced with WPC Activities. During each review/update cycle, the description of required OJT in the Statement of Work should be reviewed and updated. OJT training documentation can be uploaded as attachments; however, the Statement of Work should specify how/where the OJT completion is documented.</p> |
| <p>In the event that an AHD is not required, a simple training plan could be developed. The EETD Safety Manager could develop a template and make it available to the PIs.</p> | <p>All work requires a WPC Activity. Training plans can be included in, or attached to, WPC Activities. Division Safety Coordinators can assist Activity Leads in developing templates for training plans, where needed.</p> |
| <p>Training materials for common topics of interest needed to be developed and posted on the EETD Safety website. A line to the EETD safety website OJT tab would be added to AHD training sections.</p> | <p>Training materials for common topics of interest need to be developed. EHS Training, with support for researchers and Subject Matter Experts, should develop OJT support materials that have broad application and value. Division Safety Coordinators may work with EHS to develop materials of interest to their Activity Leads.</p> |
| <p>All lab area staff meetings should continue to have a standing "safety discussion" agenda item as an on-going OJT opportunity. The EETD Safety Manager can further support these discussions by supplying brief Safety Alerts and materials.</p> | <p>Most staff meetings include discussions of safety. The safety concerns are often integrated with research discussions rather than specific agenda items. Division Safety Coordinators can support the Activity Leads by providing information or participating in meetings, as requested.</p> |



| | |
|---|--|
| | <p>These are good practices that should be encouraged and continued.</p> |
| <p>Special-topic safety seminars should be made available to EETD personnel as a means of on-going OJT.</p> | <p>Division Safety Coordinators can work with EHS Liaisons and Subject Matter Experts to provide safety seminars of special interest to their Division personnel. This is a good practice that should be encouraged and continued.</p> |
| <p>The EETD New Hire Orientation process should be fully implemented as an additional means of providing OJT to personnel new to the lab. The process included a walkthrough of the work area and emergency procedures.</p> | <p>Some Divisions (e.g. OCFO, Engineering) provide a Division-wide new hire orientation process, while others rely on Supervisors and Activity Leads to provide orientation. Feedback from Activity Leads emphasized the importance of helping new employees understand how their work fits into the overall mission and safety systems of the Lab. New Hire Orientation would be a good topic for future Division Self-Assessments.</p> |
| <p>The results of the Self-Assessment were made available to EETD personnel.</p> | <p>The results of the 2019 OJT Self-Assessment should be made available to the personnel of the participating Divisions and to interested LBNL-wide safety and management personnel.</p> |
| <p>A follow-up self-assessment was to be performed to determine if the OJT program has improved.</p> | <p>The 2019 Self-Assessment provides a follow-up to the 2013 EETD assessment. Lab-wide progress should be evaluated as the recommendations are implemented.</p> |