Lawrence Berkeley National Laboratory
Multi-Division On-The-Job Training Self-Assessment Report
August 2024

Report Prepared By:

Raymond Cole	09 / 11 / 2024
Ray Cole, EHS	Date
Julie Drotz	09 / 13 / 2024
Julie Drotz, ALS	Date
Karen Nunez	09 / 09 / 2024
Karen Nunez, ALS	Date
	09 / 10 / 2024
Katherine Johnson, ALS-U	Date
Martin Neitzel	09 / 09 / 2024
Martin Neitzel, MSD, CSD	Date
Ronald G. Scholtz	09 / 09 / 2024
Ron Scholtz, ETA	Date
Joseph Silveira	09 / 09 / 2024
Joseph Silveira, ETA	Date
Rosanne Boudreau	10 / 03 / 2024
Rosanne Boudreau, JBEI	Date
	09 / 09 / 2024
Noah Schwartz, LD/Ops Area	Date
Andrew Peterson	09 / 09 / 2024
Andrew Peterson, EHS	Date

TABLE OF CONTENTS

Lawrence Berkeley National Laboratory
Multi-Division On-The-Job Training
Self-Assessment Report
August 2024

1. Executive Summary

Multiple divisions (ALS, ALS-U, Chemical Sciences, Materials Sciences, Energy Technologies Area, Computing Sciences Area, LD/Operations Area including Laboratory Directorate, Human Resources, Office of the CFO and Operations, JBEI, and EHS) participated in a division self-assessment of on-the-job training (OJT) practices within each of the divisions. Surveys were created for trainees and trainers, and a total of 82 trainees and 48 trainers responded to the surveys. Observations of OJT were completed by team members where possible. Survey and observation results were then analyzed to look for trends to understand what is working well and where Berkeley Lab might improve. The survey found generally positive results. Perhaps most tellingly, 97% of trainees indicated that they are comfortable performing work following OJT.

The responses do indicate possible opportunities for improvement. For example:

- Resources supplementing the training, such as job aids, procedures, and videos could be used more broadly and made available as a resource after the training
- Training could incorporate information beyond how to perform a task, such as what are common mistakes, what can go wrong, what are the critical steps, and who to reach out to with questions after the training

Some of the opportunities are consistent with recommendations in the "Multi-Division Assessment of On-the-Job Training 2019 ES&H Self-Assessment Report" including:

- Partnering between EHS and Division to develop OJT support materials
- Identifying ways to share OJT materials and best practices
- Modifying WPC to make the OJT feature more visible

Following this assessment, each division and EHS, representing the institution, will determine what actions they will take to drive continuous improvement.

2. Introduction

On-the-job training (OJT) is a technique commonly used to educate a worker on how to perform a specific task. OJT not only educates the worker, but it gives them the opportunity to practice that task under the controlled conditions established by the trainer. OJT is an important part of the integrated safety management (ISM) system, covering each core function. Workers are informed of the scope of work they are to perform. They are informed of the hazards and controls involved. They practice performing the work and have the opportunity to ask questions and receive feedback on their performance of the task before they are authorized to perform it unsupervised. Furthermore, OJT is ideally provided "just in time," or just before a worker performs a task, so the information and skills can be immediately applied.

OJT is a great opportunity to prepare a worker to perform a task, but the quality and value of OJT has the potential to vary widely. For example, OJT may vary in what topics it covers, for which tasks are included, how it is delivered, how well it is delivered, and the criteria used for "passing" a student. Students may face barriers to learning. For example, there might be language barriers, or they may be reluctant to ask questions during the OJT. Instructors also face challenges delivering OJT in the field which may impact the quality of OJT. For example, instructors have their own time constraints. They may need to be skilled in adjusting their delivery to workers with different levels of experience. They need to decide when (or if) a worker is "ready" to perform work without supervision.

In short, OJT is an important part of ISM but there are challenges associated with delivering it. It is incumbent on Berkeley Lab to ensure quality OJT is available that helps prepare workers to perform their work effectively and safely. This begs the question, how well is OJT preparing workers today? This assessment was undertaken to understand how OJT is commonly delivered and to hear from trainees (students) and trainers (instructors) about their experiences, what they think works well and what challenges they face.

3. Criteria

There are no set criteria for providing OJT, however, survey questions were devised and organized around a 3-part method advocated by EHS.

4. Assessment Scope

This assessment focused on OJT provided within the participating divisions. The intention was to focus on task specific OJT rather than more general orientations to a workspace or group.

The definition of OJT used for this assessment is:

> *On-the-Job training, or "OJT," is a training method in which a person with significant knowledge and experience (the OJT instructor) provides hands-on training to someone (the trainee) and this instruction is focused on work the trainee currently performs or in the near-future will perform. "Hands-on" means the training requires the trainee to perform a task successfully, not just answer questions about it or watch someone else do it.*

5. Assessment Methodology

This assessment used two questionnaires to collect feedback; one for trainees and one for trainers. Where the possibility allowed, staff giving OJT were directly observed.

6. Assessment Results

Results are separated by trainees and trainers.

Trainees:

Did the instructor usually demonstrate a task or skill before asking you to do it?

This question addressed the first part of the three part training method advocated by EHS. The trainer explains and performs each step of the OJT while the trainee observes and asks questions as needed. The majority of trainees (~84%) indicated that the trainer did demonstrate the task before asking the students to perform it. There were positive statements given about the delivery of OJT such as:

- "The instructor was thorough and demonstrated everything I needed to be aware of."
- "The instructor would talk me through it, then demonstrate, then watch me try."

Responses indicated possible opportunities for improvement, such as:

- "I've received OJT on hard chemistry topics without a chemist, and the person did not have much experience on the topic."
- "Just gave me resources to learn about it."
- "My hood training, provided by my PI at the time, was a little less straightforward. I performed some tasks, but was uncomfortable for a lot of it and found out later that what I learned was not standard practice."

Did you usually need to demonstrate a skill as part of the OJT?

Demonstrating skills is the third part of the three part training method advocated by EHS. Fewer trainees (~67%) responded that demonstrating a skill was a part of the training. Approximately 20% said no or some version of "sometimes." Some of the trainees suggested that showing the skill was not necessary because of the type of work or because of the experience of the worker. For example, "No demonstration of using the machine was needed since I'm an experienced user" and "No particular skill set was needed for 8.3.2."

Were there any job aids, checklists, or procedures made available to you?

The majority of trainees (~77%) indicated that some type of resource was available to the trainees to help understand the task. The specific type of resource mentioned included things like checklists, job aids, procedures and manufacturer instructions. Regular meetings were also mentioned as a resource. A few trainees indicated that these materials were available at the work location.

How comfortable or confident did you feel asking questions and performing the task during and after receiving OJT?

This question used a five point scale, with five being the most comfortable/confident. The vast majority of trainees (97%) indicated that they were comfortable/confident (answered either 4 or 5 on a five point scale) asking questions and performing the task during and after receiving OJT. This suggests that after trainees receive OJT, they are not left with obvious unanswered questions that would negatively affect their confidence to perform the task as instructed, and it

suggests that asking questions isn't a challenge for trainees, which hints at a strong environment of psychological safety during the training.

Do you have any suggestions to improve the effectiveness of the learning process of the OJT you received?

Most respondents (~70%) did not have feedback or suggestions for improvement. Of the trainees who provided feedback, the most common response was suggested access to resources, for example:

- "Anything that could facilitate the execution of the procedure more efficiently is very welcome. For example, recipes to fill out waste labels, checklists for procedures, and so on."
- "Have instructors to provide procedures needed to work on a task."
- "Maybe a video recording of the instructor, so I can look at the process again when needed."

Other suggestions included:

- "It might be helpful to provide the contacts of a few people who know how to do the task that could be asked in the future if questions come up."
- "To be able to do OJT as soon as possible."
- "I think focusing the OJT on the critical safety topics would help students remember the content."
- "The beamline gets really noisy, so the only enhancement I could think of is for the instructor to talk up more. It was challenging to understand what he was saying."

Did your OJT instructor ask you questions periodically during the OJT?

Most trainees (84%) responded that instructors do ask questions during the training.

Did the instructor give you time to ask questions?

Nearly all respondents (95%) indicated that they had time to ask questions.

How clear is it to you what you are and are not authorized to do after completing OJT?

Most trainees indicated the scope of work was clear (~84%) or fairly clear (~9%). Several trainees responded that they felt comfortable asking questions if they had any doubts about the scope of work. Several of the answers reiterated the importance of access to supporting/supplemental resources after the training was provided.

A few responses suggest possible concepts to highlight and reinforce in the training, such as:

- "There was not a lot of discussion about what I am not authorized to do in OJT."
- "I would appreciate some advice on common mistakes or misunderstandings…"
- "I know who to ask when in doubt."

OJT Trainers

Was there criteria for choosing you to provide OJT, and if you select other people to give OJT, what criteria do you use?

Most answers to this question included some combination of experience and expertise. This included familiarity with the equipment or topic based on past use. Some answers indicated the person has some ownership, oversight or supervisory role, such as being the WPC activity lead, manager, supervisor, beamline scientist, or owner of the system. There were fewer answers for how they delegated responsibilities, but responses usually included demonstrated proficiency and work experience.

How were you trained or prepared to give this OJT?

There were a wide variety of responses to this question, including:

- Trained by other staff or former users
- Trained by the vendor
- Trained by EHS staff
- Use SOPs, manuals, etc. to guide training/learning
- Shadowed an existing user
- Previous education and experience
- Training through use

Several answers indicated a combination of the above techniques; for example, one response indicated formal training, hands-on experience, and mentorship. Six people stated they trained themselves, which represents about ~12-13% of responders. In one case the trainer indicated this was because they built the system themselves.

How do you decide what to cover in the OJT and is this documented?

Approximately 29 people (~61%) indicated they use some type of SOP, checklist, WPC activity, guidance material, etc. This is somewhat consistent with responses to the next question indicating that 73% of trainers use some type of job aid, checklist, etc. to supplement their OJT.

Several people indicated they cover things that can go wrong or how to troubleshoot problems as part of the training. Note however that in response to other questions, several trainees stated that they would like training that covers things like mistakes, what can go wrong, and what someone is not authorized to do.

Several people indicated OJT is informed by the particular type of research being performed, the particular equipment being used and/or by EHS input/collaboration. Several people indicated the content delivered during OJT depends on the knowledge the trainee already possesses.

Do you use job aids, checklists, posters, or other materials to guide the OJT?

The majority of trainers (~73%) responded that they use some type of resource to supplement their OJT. This is consistent with trainee responses. About ~77% of trainees indicated yes to a similar question.

How do you decide, or what criteria do you use, to pass someone receiving the OJT?

A majority of respondents (~58%) stated that trainees need to demonstrate how to do the particular task. Trainee demonstration of skills is the third part of the three-part OJT structure recommended by EHS. Other answers noted that trainees needed to express a clear understanding of the task and can answer questions about the task. A few respondents indicated that the trainees only need to express comfort/confidence performing the task (versus demonstrating competence).

How and where are you documenting who has completed the OJT?

The responses to this question varied.

- 18 people indicated WPC
- 8 people indicated a logbook
- 12 people indicated through a checklist/procedure, a group Google drive or through something like email
- 6 people indicated it is not documented
- 6 people indicated through the training database

Some programs, like laser and radiological safety, require OJT to be documented, but in most cases, there are no requirements to document OJT. In some cases however, trainers or divisions may want to document the OJT. There is no consistent way that OJT is documented. Of the various methods used to document OJT completion, WPC is the most commonly used method.

Are other individuals in your work space teaching this same OJT topic, and if so, do you coordinate with them to ensure consistency in training (e.g., same topics are covered, same skills demonstrated, same criteria for passing, etc.)?

This question was two questions in one, so in some cases, the responses weren't clear if they were answering the first question, the second question or both questions. From the answers, it seems that about 50% of respondents indicated that others in the workspace are teaching the same OJT and that there is an effort to ensure consistency. Checklists and SOPs were one way trainers ensured consistency. Partnering with other trainers was another way, and direct training of the other staff conducting OJT was another method.

Do you ever waive OJT for a person? How did you decide whether or not to waive the training for that person?

Most trainers were emphatic that OJT is not waived. About ~70% said OJT isn't waived. Of those waiving OJT, most indicated they waive OJT if the trainee possesses sufficient experience. Trainers may also waive training if the people are returning scientists and have previously completed OJT, if they can demonstrate the needed skill and/or communicated understanding, or if they received equivalent training elsewhere.

What are some of the most challenging aspects of teaching OJT from your perspective?

Trainers voiced a wide variety of challenges to providing OJT including:

- Time to teach
- Deciding what's good enough for OJT
- Deciding how much time a person needs
- Scheduling
- Ensuring consistency in training
- Making sure someone understands/evaluating someone's understanding
- When to know a worker is ready to work unsupervised
- Different learning styles; adapting style to the individual
- Staff without sufficient knowledge of the task/work
- Staff with different levels of understanding of the task/work
- Follow up (which also takes time) to make sure the individual understands
- Managing people with bad attitudes
- Gap between training and performing the work (forgetting the training)
- Non-centralized information
- Troubleshooting rarities (do you include these)
- People afraid to ask questions
- Language barriers
- Trainees with insufficient foundational knowledge

Time is the most frequently mentioned challenge followed by evaluating someone's understanding.

7. Conclusion

130 people responded to OJT survey questions. The responses provide insight into how OJT is provided and received at Berkeley Lab. The responses are encouraging in many ways. 97% of trainees indicated that they are comfortable performing work following OJT, and 84% indicated that it is clear to them what they are authorized and not authorized to do. Trainers ask questions during OJT, and trainees stated they have time during OJT to ask questions.

In nearly all cases, the trainers are explaining and demonstrating the task. A lower percentage (but still a majority) of the trainees need to demonstrate the task. There was not a question

specifically asking if trainees direct the instructor through the task during OJT, but some of the responses suggested that trainers rely on trainees expressing a clear understanding of the task in order to “pass” them.

Despite the positives, the feedback does hint at some opportunities for improvement. Below are some considerations for Divisions and EHS.

Considerations for Divisions:

- **OJT trainer selection:** Divisions should consider assigning trainers that are not only qualified in the subject area but also have the temperament and social skills to create a psychologically safe learning environment where the students feel comfortable speaking up and asking questions when needed.
- **Resource availability:** While many respondents stated that resources such as job aids and checklists were available, approximately 25% of OJT does not have these types of resources available. Access to resources after training was the most common opportunity cited by trainees as a way to improve the process. Consider making resources available as part of the training. These resources also help where multiple instructors in a given work space teach the same OJT topic: having documentation of what is covered and what skills must be demonstrated to pass, would help ensure that students receive similar training no matter which instructor teaches their OJT session.
- **Resources at the work location:** Resources available in the work environment are there when a worker may need them and are that much more likely to be used. This should be considered a best practice. These could be printed posters, or these could be QR codes that link to additional resources.
- **Contact information:** Several trainees spoke to the importance of knowing who to go to with questions following the training. This should be standard information included in the OJT.
- **Training content:** Document a training outline, which can communicate the key learning objectives and skills the trainee should be able to know and demonstrate. Training should include examples of mistakes people have made or where things can go wrong. The critical steps in the task could be explicitly mentioned to draw attention to those steps.
- **EHS engagement:** Divisions should consider reaching out to the EHS Division to help develop training material.
- **Create OJT resource videos:** Several respondents suggested recording the OJT. This could help supplement the OJT process and potentially reduce the time burden if trainees watched this first. It could be used as a resource if a worker needed a refresher. Access could then be available by a QR code at the work location.
- **Use WPC to document OJT:** In most cases, documentation of OJT is not required, but there may be reasons trainers and divisions want to document OJT. WPC seems to be the most common way to record OJT. It should be communicated and encouraged.

Considerations for the EHS Division:

The EHS Division should consider enhancing existing tools and resources and creating new materials to support divisions and trainers providing OJT. Working with Division to help develop OJT materials, this could include:

- OJT documents or templates that define a particular OJT so that it is consistent from trainer-to-trainer
- Determining what types of resources and support would be most useful to OJT instructors
- Considering a central repository for common OJT materials
- Improving OJT within the WPC/Activity Manager system so it is more useful and accessible

APPENDIX A — DIVISION SPECIFIC INFORMATION

General impressions from ALS and ALS-U

For ALS, most of our OJT is for radiation safety, which has a requirement for documentation. Courses are geared toward specific tasks for beamline scientists, users and technical staff. During this self-assessment, we observed 11 training sessions and used this data along with the responses from the survey to form the basis of our assessment results. From the survey, we received 20 responses from trainers and 19 responses from trainees.

For ALS-U, while no observations of OJT were made, electrical work practices and LOTO RI briefings during site visits suggested a need for increased emphasis on OJT. With the growth in LOTO for RI tasks related to the upgrade, several new LOTO RI's are undergoing training. Although OJT is not currently a requirement for LOTO RI's in WPC, these new RI's would benefit from additional field support and oversight to ensure they fully understand their critical roles and responsibilities as LOTO RI's.

Documentation is the most inconsistent part between all types of OJT; formats include several different electronic and hard copy methods. Some trainers expressed interest in moving towards electronic records for training with documentation requirements. In most cases, OJT is assigned a course number in the Berkeley Lab Training (BLT) database, and the requirement is assigned through WPC or the ALS equivalent system for users. One noteworthy practice that we have implemented is to have a QR code linked to a digital course summary page, and after the trainee reads and acknowledges understanding of the concepts, they are able to enter their LBNL ID to record course credit. This streamlines the process and reduces the administrative burden on staff.

Trainers demonstrated consideration for their responsibility in training others. They bring many years if not decades of experience and are typically the sole individual to give instruction as designers of equipment or the only one in a senior or permanent position to train others. Training in most cases included a demonstration and explanation of a task followed by watching the learner perform the task. Several trainers we observed expressed an interest in finding ways to better coordinate, schedule and set up the training.

Among the beamline scientists giving hutch OJT, we observed some variation in the quality of training. Some scientists were very engaging, and others were more soft spoken. This is to be expected, but to help make the training more uniform we plan to share best practices and lab resources with all OJT trainers.

Recommendations for ALS and ALS-U:

- Have annual OJT discussion with hutch beamline scientists to share issue, ideas, concerns and best practices

- Discuss options for expanding our use of electronic records for OJT to reduce paper copies of training logs.Create a written description for onboarding new OJT instructors to describe their role and responsibilities and provide more consistency in training.
- ALS-U will focus on providing additional OJT support for newly trained LOTO RI’s. Checklists for new RI’s will be developed and more field support will be provided by the newly hired ALS/ALS-U ESO.

Title	OJT multi-division self assessment report for signatures
File name	OJT_multi-divisio..._August_2024.docx
Document ID	1f6bc6748e7abcc229c46b5e017a1b259459a836
Audit trail date format	MM / DD / YYYY
Status	Signed

Document History

SENT	**09 / 09 / 2024** 15:37:15 UTC	Sent for signature to Andrew Peterson (afpeterson@lbl.gov), Ray Cole (rayc@lbl.gov), Karen Nunez (knunez@lbl.gov), Julie Drotz (jbdrotz@lbl.gov), Katherine Johnson (kmjohnson@lbl.gov), Martin Neitzel (mlneitzel@lbl.gov), Ron Scholtz (rgscholtz@lbl.gov), Joseph Silveira (jcsilveira@lbl.gov), Rosanne Boudreau (rmboudreau@lbl.gov) and Noah Schwartz (nischwartz@lbl.gov) from afpeterson@lbl.gov IP: 73.127.154.116
VIEWED	**09 / 09 / 2024** 15:37:19 UTC	Viewed by Andrew Peterson (afpeterson@lbl.gov) IP: 73.127.154.116
SIGNED	**09 / 09 / 2024** 15:37:29 UTC	Signed by Andrew Peterson (afpeterson@lbl.gov) IP: 73.127.154.116
VIEWED	**09 / 09 / 2024** 15:40:38 UTC	Viewed by Joseph Silveira (jcsilveira@lbl.gov) IP: 174.160.183.38

Dropbox Sign

Audit trail

Title	OJT multi-division self assessment report for signatures
File name	OJT_multi-divisio..._August_2024.docx
Document ID	1f6bc6748e7abcc229c46b5e017a1b259459a836
Audit trail date format	MM / DD / YYYY
Status	Signed

Document History

VIEWED	**09 / 09 / 2024** 15:45:03 UTC	Viewed by Noah Schwartz (nischwartz@lbl.gov) IP: 73.202.136.32
SIGNED	**09 / 09 / 2024** 15:45:36 UTC	Signed by Noah Schwartz (nischwartz@lbl.gov) IP: 73.202.136.32
VIEWED	**09 / 09 / 2024** 15:50:19 UTC	Viewed by Karen Nunez (knunez@lbl.gov) IP: 131.243.155.25
SIGNED	**09 / 09 / 2024** 15:52:35 UTC	Signed by Karen Nunez (knunez@lbl.gov) IP: 131.243.155.25
VIEWED	**09 / 09 / 2024** 16:11:15 UTC	Viewed by Ron Scholtz (rgscholtz@lbl.gov) IP: 128.3.105.210
SIGNED	**09 / 09 / 2024** 16:11:33 UTC	Signed by Ron Scholtz (rgscholtz@lbl.gov) IP: 128.3.105.210

Dropbox Sign

Audit trail

Title	OJT multi-division self assessment report for signatures
File name	OJT_multi-divisio..._August_2024.docx
Document ID	1f6bc6748e7abcc229c46b5e017a1b259459a836
Audit trail date format	MM / DD / YYYY
Status	Signed

Document History

VIEWED	**09 / 09 / 2024** 17:06:09 UTC	Viewed by Martin Neitzel (mlneitzel@lbl.gov) IP: 35.132.174.231
SIGNED	**09 / 09 / 2024** 17:06:36 UTC	Signed by Martin Neitzel (mlneitzel@lbl.gov) IP: 35.132.174.231
SIGNED	**09 / 09 / 2024** 18:49:41 UTC	Signed by Joseph Silveira (jcsilveira@lbl.gov) IP: 128.3.22.35
VIEWED	**09 / 09 / 2024** 19:42:34 UTC	Viewed by Rosanne Boudreau (rmboudreau@lbl.gov) IP: 135.180.92.173
VIEWED	**09 / 10 / 2024** 19:09:37 UTC	Viewed by Katherine Johnson (kmjohnson@lbl.gov) IP: 131.243.163.27
SIGNED	**09 / 10 / 2024** 19:14:10 UTC	Signed by Katherine Johnson (kmjohnson@lbl.gov) IP: 131.243.163.27

Dropbox Sign

Audit trail

Title	OJT multi-division self assessment report for signatures
File name	OJT_multi-divisio..._August_2024.docx
Document ID	1f6bc6748e7abcc229c46b5e017a1b259459a836
Audit trail date format	MM / DD / YYYY
Status	Signed

Document History

VIEWED	**09 / 11 / 2024** 21:41:02 UTC	Viewed by Ray Cole (rayc@lbl.gov) IP: 131.243.211.92
SIGNED	**09 / 11 / 2024** 22:05:26 UTC	Signed by Ray Cole (rayc@lbl.gov) IP: 131.243.211.92
VIEWED	**09 / 13 / 2024** 16:19:32 UTC	Viewed by Julie Drotz (jbdrotz@lbl.gov) IP: 98.97.25.58
SIGNED	**09 / 13 / 2024** 16:19:55 UTC	Signed by Julie Drotz (jbdrotz@lbl.gov) IP: 98.97.25.58
SIGNED	**10 / 04 / 2024** 03:17:40 UTC	Signed by Rosanne Boudreau (rmboudreau@lbl.gov) IP: 128.3.118.203
COMPLETED	**10 / 04 / 2024** 03:17:40 UTC	The document has been completed.