Lawrence Berkeley National Laboratory

EHS Training

Guidance for OJT Instructors

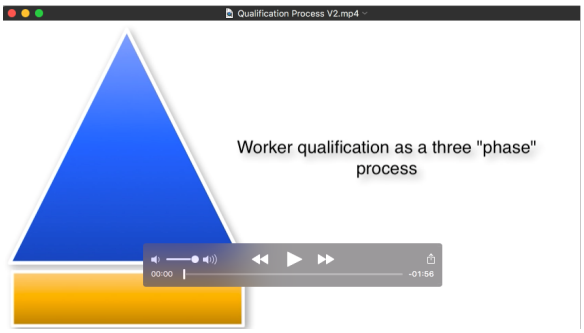
Welcome

A trained and qualified workforce is essential to LBNL science, operations and business processes. Training and qualifying workers is based upon an understanding of the knowledge, skills, and abilities (KSAs) that are needed for workers to successfully fulfill their responsibilities in performing their jobs, duties and work activities safely and effectively. This primer is intended for those who provide On-the-Job Training (OJT) instruction to individuals as part of worker qualification.

Purpose

The purpose of this primer is to provide guidance for understanding how On-the-Job training fits within worker qualification process. It also provides guidance for how to determine the need for On-the-Job training, and for how to provide effective OJT.

For a brief video overview of worker qualification process and how OJT fits within this, you can watch this short video which positions worker qualification as a three phase process.



Introduction

On-the-Job training is designed to prepare workers for performing their work activities safely and effectively. It is an iterative performance-based process of experienced staff or supervisors working with trainees until they demonstrate, to the trainer's satisfaction, an appropriate level of understanding and mastery of the specific tasks.

On-the-Job training is based on the generally accepted principle that people learn best by doing. A person learns to swim by swimming, drive by driving, fly by flying, etc. Skills requiring the use of tools, machines, and equipment are suited to OJT, as OJT is a proven method for teaching mental and physical skills that require learner performance and practice for mastery. It is also well suited for work skills that require a combination

of mental knowledge and physical dexterity such as taking measurements, calibrating and/or using equipment, and performing multi-step processes, for example.

OJT may be used as part of an individual's primary training program, and to supplement or to maintain skills already learned. It can also be used for cross-training purposes.

Advantages of OJT

Training in the actual work environment is an effective way to train personnel, because the “trainee” is surrounded with the sights, sounds, and dynamics of the environment where the actual work takes place. In this way, the training is direct, applicable and targeted to the specific work activities that will be performed, and the learner learns by doing. In contrast, classroom and online courses are designed to produce learning outcomes that are more generalized.

For example, a classroom course, designed to teach participants how to split and redirect a laser beam, could be used to help workers understand the general hazards associated with the process, and how they are controlled. It could also be used to help a worker develop a mental model of the process as well as how to identify and solve common problems associated with this task. However, it would not be useful for learning about the specific hazards and controls associated with each person’s work, or to develop the skills and technique necessary to perform specific work activities. This is because classroom training does not provide guided hands-on physical practice using tools and equipment specific to each persons setup.

In short, classroom courses are suited for teaching theory, concepts and problem solving and for developing generalized knowledge, where as OJT is suited for teaching tasks that require hands-on guided interaction to develop the techniques and skills needed to perform activities safely and effectively.

Determining the need for OJT

Line management has the responsibility to assure that staff are qualified to perform their work activities and tasks both safely and effectively. A useful method to achieve this is to perform OJT. However, determining the need for OJT is not a black and white process; it requires an individualized appraisal of each person’s knowledge, skills and abilities within the context of the work being performed. For example, two workers may have a similar level of previous education, experience and training, but have very

different levels of skills and abilities in relation to the tasks each needs to perform. One worker may need ongoing guided practice to develop the needed skills, while the other worker may only need to guidance and practice in relation to a single task because they demonstrated skilled performance in performing all other tasks.

The following four-step process provides a simple framework for evaluating the need for OJT:

Step 1: Identify the tasks and activities to be performed (scope).
Step 2: Identify the competencies needed to perform the activities (safely and effectively). This is sometimes referred to as determining standards of performance.
Step 3: Evaluate how well the worker performs in relation to the standards/expectations (identify gaps)
Step 4: Provide on-the-job training (as needed) to develop needed competencies (close gaps, or develop the needed skills)

Even though this is a simplified framework, it clarifies two important factors

(1) to have a clear understanding of the desired end state (the level of proficiency you want the worker to be able to perform)

(2) To evaluate worker's readiness (ability to perform at level of expectation – or need) - Not to assume readiness

Using an example

Let's say that a worker needs to operate a Schlenk line and High-Vacuum line as part of the project they are joining. The worker is new to the lab but has some knowledge of the process and has used the equipment in college a few years ago. In addition, they have used similar equipment at another research facility, but the context, application or scale were different. They have completed EHS 0348 Chemical Hygiene and Safety, and EHS 0171 Pressure safety training. When asked if they feel confident in being able to use the setup, they say yes.

Based on this, you recognize that the person has some experience using the equipment, but you also recognize that the application for its use and the context were different.

You also recognize that even though they have completed EHS Trainings that these are only designed to meet general learning outcomes, and therefore do not teach how to use specific equipment or identify the specific hazards and controls of an individual's work. You also know that the worker is new to your group, and that if they were to make a mistake, that this would not only impact their safety, and perhaps the safety of others, but it may also risk the integrity of the experiment and equipment. Given all of these factors you determine that OJT is needed to assure they are capable of operating the equipment safely and effectively.

The following puts this example into the framework mentioned above.

Step 1: Identify the work activities to be performed

a. *Activity involves using a Shlenk Line and High-Vacuum line to (_____).*

Step 2: Identify the level of competencies needed to perform the work activities

a. *Use start-up procedure and shut-down procedure for the Schlenk line and High-Vacuum line.*
b. *Locate and use safety devices and emergency procedures:*
    i. *Condensing Liquid Oxygen in trap,*
    ii. *Pyrophorics or toxic gases in trap,*
    iii. *component failure,*
    iv. *power interruption,*
    v. *gauge failure,*
    vi. *installed safety devices, safety equipment, and emergency evacuation.*
c. *Demonstrate ability to inspect equipment effectively and indicate factors that would compromise equipment (potential failure points and methods to control).*
d. *Demonstrate competence in and an understanding of the standard operating conditions for the Schlenk Line and High Vacuum Line by performing a sample manipulation.*

Step 3: Identify the extent to which the worker is able to perform above work activities effectively and safely.

a. *Evaluate knowledge through discussing the operation to determine how well the "trainee" can explain the "how" and "whys" of the operation.*
    a. *Discussion can be used to evaluate worker's knowledge of system, process-procedure, safety factors and response….*
b. *Evaluate performance by having "trainee" perform the work with you.*

a. *Determines level of performance and gaps so that you have clarity on the skills to develop.*

Step 4: Based on observation, provide on-the-job training to develop abilities

a. *Model how to perform the operation*
b. *Perform the operation together explaining why you do what you do*
c. *Allow "trainee" to perform the operation when they seem ready under your direct guidance.*
d. *OJT may be ongoing during the learning period as the worker develops the techniques needed to perform the work safely and effectively.*

Another consideration for determining the need for OJT is the level of risk associated with performing the work. It is expected that the higher the risk, the more effort and care that will be invested in assuring that staff are prepared and ready (competent). This can be broken down as follows:

- Higher Risk: examples include laser and radiological work. Training/qualification is specified and documented in the formal work authorization packages as governed by policies, regulations, codes and standards.
- Medium Risk: examples may include work with complex instrumentation or processes. Training/qualification requirements are driven by a blend of line management accountability and hazard assessment where the level of documentation is specified by Division policies and/or practices.
- Lower Risk: standard work practices typically encountered in R&D labs, craft/technical work, or offices. The method of qualification may be informal with minimal or no documentation.

Providing Effective OJT

OJT is most often conducted as a one-on-one between the trainer and trainee, or in very small groups. One-on-one is most preferable, because this allows the teaching and learning to be tailored and adapted to the subject and worker's specific needs. Another advantage is that one-on-one training allows the trainer to use language that is well suited to the trainee, and set a pace that is appropriate. When OJT is done with groups, the groups should be small (no more than a few trainees). This ensures that the trainer can effectively provide individualized attention.

The primary OJT instructional method is demonstration-performance. The science teacher uses the demonstration-performance method to teach laboratory procedures. The electrician teaches the apprentice electrician using this method. A professor of medicine uses it to teach surgical skills. In each case, the trainer demonstrates the particular procedure to the learners and then acts as coach while they practice the skill. When conducting OJT, it is most effective when the trainer prepares the trainee for task performance by introducing the task, explaining it, demonstrating it, and then coaching the trainee as he/she performs the task. During the practice period, the trainer points out potential hazards, risk, and common errors and then observes to evaluate readiness while guiding learners toward the desired performance.

Here is the demonstration-performance structure in greater detail:

- **The trainer explains** the task and tells the trainee what he/she is expected to learn. 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. If the trainee does something that is unsafe, training should be stopped, explained and the condition corrected.
- **The trainer shows** the trainee the steps or process by performing the task. The trainer demonstrates the task exactly the way the trainee is expected to perform it. While demonstrating the task, the trainer should ask questions of the trainee to ensure the trainee understands the steps. The types of questions should elicit discussion to guage the depth of understanding rather than simple “yes” or “no” responses. The demonstration can be repeated until the trainee has a clear picture of the action and understands how and why to perform it.
- **The trainee will then practice** performing the task under the guidance of the trainer. As the trainee performs each step of the task, the trainer watches for the skillful performance of steps, in sequence, and with accuracy, and makes comments and corrections as required.
- **Positive reinforcement** to the learning process is very important during this phase. It is essential to an adult learner to "do" the activity to learn it. Additionally, make sure the trainee does it correctly; all critiques and comments regarding performance should be positive and motivating. Negative criticism, belittling, or degrading comments will disrupt the learning process.
    - The trainee should be allowed to practice the activity a sufficient number of times to gain confidence and competence.

- Practice reinforces learning; it cannot be relegated to a lesser status during the OJT process. The trainer must be patient with the trainee and allow the trainee to master the activity at his or her own pace.

The length of training depends on the complexity of the activities to be learned, how often the person performs the tasks and their previous training and experience, but OJT should be considered an ongoing process. Observing and evaluating worker performance should also be ongoing, not just one time. This assures that the tasks are performed correctly and allows the trainer to observe worker's ability to follow processes, and perform the work safely.

Qualities of a good OJT trainer

Every one of us has our own teaching style, and we should use this to good advantage. The following provides an overview of some qualities that help create an effective teaching and learning partnership.

Enthusiasm for Producing Learning

- Enthusiasm is having a real enjoyment in what you do. This is a natural part of showing interest in the learning process and how well you relate to your trainees.

Subject Matter Expertise

- The trainees should be able to look to the trainer as the expert. This calls for a level of skill and knowledge that meets or exceeds the standards set for the performance on the job. In this way, choosing an OJT instructor is a careful consideration tailored to the activity.

Effective Communication Skills

- Communication skills are often referred to as interpersonal or people skills. These skills determine how others perceive you. Your success is largely rooted in your ability to get ideas across to others and to understand what others are saying to you. To be effective as a trainer, you must be responsible for making certain that the messages get through clearly in both directions; information from you to the trainee, and information from the trainee to you.
- There are many ways to use your voice to communicate better. The important thing is to know it does have an effect on the trainee. The words you choose,

the sequence you put them in, and the way you say them has a lot to do with how effective your communication will be.

- Language and cultural understandings can influence communication. If language limitations impacts understanding trainer or trainee should get help.

Effective Presentation Skills

- Presentation skills include public speaking, effective listening, observing skills, proper use of feedback techniques, reinforcement, motivation, and organizational skills. Having practiced presentation skills can help put the trainee at ease so they are comfortable raising questions.

Positive Attitude

- Your attitude is a reflection of the way you feel about yourself, your job, and your world. Most of what we do is a result of how we feel, rather than of what we know. A good, positive, attitude reflects the philosophy and goals of the organization. Acquiring such an attitude will have a positive effect on the trainees, enhance their performance, give them a desire to learn, and assist in their own development of a positive attitude. A positive frame of mind can make a difference in you and in the people with whom you work.

Patience and Empathy

- The key is to allow learner's to learn at his or her own pace. No two trainees will be alike yet usually they will all try to be successful in their efforts. Do not condemn poor performance but strive to understand what is causing it and allow the trainee the time and practice to improve. Try to understand the changes that the trainee is going through and be supportive whenever possible.

Counselor and Advisor

- The trainees expect your instruction and support. They need your feedback on their performance. They want to know what progress they have made and on what they need to work. You can help them by giving them direction and suggestions on performing their job correctly. You need to have high standards, yet be realistic in your expectations of the trainees. Be fair and objective when assessing their performance. Commend them on their strengths and help them to improve their weaknesses. In other words, strive to be a support to the trainees, not a hindrance or critic.

Prepared

- People will generally accept the ideas of an organized person much faster than they will accept the ideas of a disorganized one. It is to your advantage to act, speak, and think in a logical, well-planned manner. It is especially important for the trainer to be organized and familiar with the training process. Trainees will recognize and appreciate when the trainer is prepared.

CONCLUSION

When on-the-job training is integrated into the culture of "doing great science" and "doing great business" it becomes an efficient and effective way to develop competent and qualified workers. This document provided an overview of the value of OJT, determining the need for OJT, and a framework for providing effective OJT.

Acknowledgements:

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Examples of OJT forms and Checklists

Sample OJT Checklist

Student's Name: **Date:**

Trainer's Name:

Task to be performed:	
Condition:	
Standard for performance:	
ES&H considerations:	

Method of Accomplishment (MOA): P (perform), S (simulate), O (observe), D (discuss)

Task #	MOA	Task Description – Initiators/Terminators			Remedial	
			Pass	Fail	Pass	Fail

Trainer's Evaluator's Signature: _____

Remarks:

OJT Example
The example below illustrates the three elements of OJT to be included in on- the-job training (OJT) and that could be attached to a Work Planning & Control Activity Document.

Objective: Trainees must demonstrate proficiency in the operation of the Schlenk line and High-Vacuum line to the satisfaction of the PI or designated trainer (Activity Lead/Supervisor), including use of safety devices and emergency procedures in the event of an emergency or an unplanned event.

Target audience: Schlenk line and High-Vacuum line operators.

1. Skills and/or information to be learned and/or demonstrated:
    a. Use start-up procedure and shut-down procedure for the Schlenk line and High-Vacuum line.
    b. Locate and use safety devices and emergency procedures: Condensing Liquid

Oxygen in trap, Pyrophorics or toxic gases in trap, component failure, power interruption, gauge failure, installed safety devices, safety equipment, and emergency evacuation.

c. Demonstrate competence in and an understanding of the standard operating conditions for the Schlenk Line and High Vacuum Line by performing a sample manipulation in the presence of the PI or designated trainer (supervisor/work lead).

Example OJT Form:

Trainee Name	**Skills and/or information to be learned and/or demonstrated**	**Training completed (signoff)**		
		Date	Trainee Signature	Trainer Signature
	Operate Schlenk Line			
	Opertae High-Vacuum line			
	Locate and use safety devices/controls			
	Explain emergency procedures			
	Selection & Use of PPE			

Record keeping

Description of record	**Custodian**	**Indexing Method, Storage Medium**	**Federal Retention Requirement***
Completed on-the-job training record	Division Responsible for delivering training	Index by trainee name, store on paper or electronically	NA