

CONSTRUCTION SAFETY PROGRAM

1.0 Objective

The objective of this performance assessment is to evaluate the effectiveness of the laboratory's construction safety program as implemented on construction or modification projects at the facility. The Facility Representative or Environmental, Safety, and Health Support Specialist examines policies, procedures and programs implemented on construction projects. To evaluate the effectiveness of implementation, the Facility Representative or Environmental, Safety, and Health Support Specialist observes work activities, interviews personnel, conducts walkthroughs of the worksite, and reviews specific documents.

2.0 Definitions

Concern - A determination of a programmatic breakdown or widespread problem supported by one or more findings or observations.

Finding - An individual item which does not meet requirements.

Functional Area - A discrete group of related safety and support programs.

Lines of Inquiry - Questions that guide the assessor in planning and conducting the performance assessment.

Observation - A condition or practice that does not provide or promote effective protection of the health and safety of the public or DOE's workers or the environment.

Performance Assessment - An evaluation of a program or functional area to verify laboratory line management effectiveness in ensuring the health and safety of the public and of DOE's workers and in ensuring protection of the environment.

Performance Attributes - Key elements, functions, or activities to be assessed in a particular functional area.

3.0 References

- 3.1 DOE O 231.1, *Environment, Safety, and Health Reporting*
- 3.2 DOE O 440.1A, *Worker Protection management for DOE Federal and Contractor Employees*
- 3.3 29 CFR 1926, *Occupational Safety and Health Regulations for Construction*

4.0 Performance Assessment Activities

Prior to or during the course of this assessment, the assessor reviews selected project documents. Appendix A provides a suggested list of documents for review.

During the assessment, the assessor evaluates selected performance attributes by developing and applying lines of inquiry for each performance attribute. In implementing each line of inquiry to determine if the construction project is meeting the performance attributes, the assessor completes a range of activities such as reviews of project documents, interviews with construction personnel, observation of construction site activities, and walkthroughs of the worksite. Appendix B provides a listing of suggested performance attributes and lines of inquiry.

The functional area of construction safety can be further broken down into a number of individual areas whose safety and health programs must be effectively implemented. These areas include excavations, scaffolding, electrical safety, fire protection, hoisting and rigging, heavy equipment operations, and programs implemented to mitigate specific hazards such as asbestos, noise, carcinogens, and radiation. This assessment is not intended to provide a comprehensive examination of each individual technical area within the overall functional area of construction safety. However, it is equally impossible to determine the effectiveness of the overall construction safety program without at least sampling performance in some of the functional areas of construction safety. A number of specific programmatic performance assessment guides have been developed to evaluate performance within discreet areas and can be used in conjunction with this guide for that purpose. In conducting this assessment, the assessor may also draw upon surveillance guides prepared for the construction safety and other applicable functional area. The following guides are available:

CPS 8.1	Hoisting and Rigging
CPS 8.2	Trenching and Excavation
FPS 12.2	Fire Protection and Prevention
OSS 19.1	Personal Protective Equipment
OSS 19.2	Electrical Safety
OSS 19.3	Confined Space Entry
OSS 19.4	Pressure Safety
OSS 19.5	Hazardous Waste Operations and Emergency Response
OSS 19.6	High Energy Systems
OSS 19.7	Ergonomics
OSS 19.8	Heat Stress
OSS 19.9	Industrial Hygiene
OSS 19.10	Barriers and Postings
OSS 19.11	Injury and Illness Recordkeeping
OSS 19.12	Chemical Safety

The emphasis of this assessment is on the effectiveness of the laboratory's construction safety program as implemented on projects at a particular facility. Construction may include a range of

activities including building new facilities, modifications to or renovation of existing facilities, or dismantling, disassembling or deconstructing existing facilities. The assessor is responsible for determining those activities at a facility that will be considered as construction for this assessment.

In performing the assessment, the assessor must balance review of site-wide programs, project-specific plans, and actual performance in the field. The following questions provide a general framework that should be used in planning, conducting, and documenting the assessment:

- Has the laboratory identified all hazards with the construction activities and provided appropriate mitigation?
- Have hazards been communicated to workers and do they understand their responsibilities for mitigating the hazards?
- Is construction work being performed safely and in accordance with established administrative requirements?

APPENDIX A
SUGGESTED DOCUMENTS TO BE REVIEWED

Construction Safety Program Document
Project Safety and Health Plan
Preliminary Hazard Analysis
Activity Hazard Analyses
Project Training Records
Project Inspection Records
Project Audit Records

APPENDIX B

PERFORMANCE ATTRIBUTES AND LINES OF INQUIRY

PERFORMANCE ATTRIBUTE: I. The laboratory has established the organization, administration, and management to provide for effective implementation of the laboratory Occupational Safety and Health program on construction projects.

LINES OF INQUIRY:

1. Are construction project occupational safety and health roles, responsibilities, authorities, and accountabilities clearly communicated and understood by project personnel?
2. Has the laboratory designated in writing the construction superintendent who is assigned full responsibility and authority for implementing the laboratory's occupational health and safety program?
3. Has the construction superintendent designation been provided to the construction manager?
4. Does the construction superintendent designation letter indicate personnel having authority to act for the laboratory during periods of absence of the construction superintendent?
5. Is the construction superintendent or other duly designated laboratory representative required to be present on the worksite during the performance of any project work activities?
6. Does the laboratory provide for the worksite presence of full-time occupational safety and health professionals where required by project activities?
7. Does the laboratory ensure compliance with project safety and health requirements by all project subcontractors?
8. Does the laboratory coordinate with project subcontractors and other site contractors those Occupational Safety and Health program elements addressing worksite hazards to which employees of other contractors may be exposed?

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PERFORMANCE ATTRIBUTE: II. The laboratory has an approved project safety and health plan in place to implement occupational safety and health requirements for construction and modification projects.

LINES OF INQUIRY:

1. Does the project safety and health plan include the laboratory's proposal for implementing the Safety and Health program requirements?
2. Does the safety and health plan identify the construction superintendent and other personnel assigned occupational safety and health duties on the worksite, their qualifications, and their respective duties?
3. Does the safety and health plan specify individual(s) authorized to act for the laboratory during the absence of the construction superintendent?
4. Does the safety and health plan include a detailed outline of the proposed employee worksite safety and health orientation?
5. Is the safety and health plan maintained on the worksite?
6. Is the plan made available upon request to the construction manager, project manager, worksite employees, employee representatives, and other personnel with assigned oversight responsibilities?

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PERFORMANCE ATTRIBUTE: III. The laboratory has evaluated the work associated with each project phase to identify specific hazards to which worksite employees and other worksite personnel may potentially be exposed and has identified and implemented appropriate control measures.

LINES OF INQUIRY:

1. Does the laboratory have an approved Preliminary Hazard Analysis (PHA) in place before beginning work on the construction or modification project?
2. Does the PHA identify the anticipated construction phases involved in the project?
3. Does the PHA identify the types of hazards associated with each anticipated phase of the project as well as potential control measures and programs necessary to protect employees and others at the worksite?
4. Does the PHA identify the phases of the project for which DOE-prescribed occupational, safety, and health standards or the construction/modification project acquisition documents require that protective measures be designed, inspected, or approved by a Professional Engineer or other competent person?
5. Does the laboratory have an approved Activity Hazard Analysis (AHA) in place before beginning work on any phase of the project?
6. In those cases where the laboratory is relying on the Preliminary Hazard Analysis, is this intent noted on the PHA and approved by the construction manager?
7. Does the AHA identify the specific hazards, including the use or presence of any hazardous chemicals, associated with each activity to be performed in that phase of work as well as the actual corrective measures planned to control these hazards?
8. Does the AHA include drawings and/or documentation for all protective measures for which the construction/modification project acquisition documents or applicable occupational safety and health standards prescribe preparation by a Professional Engineer or other competent person?

9. Does the AHA identify the individual(s) who will conduct inspections where required by DOE-prescribed occupational, safety, and health standards or construction project acquisition documents?
10. Does the AHA identify the qualifications of the individual(s) who will conduct the inspections?
11. Have all corrective measures to control hazards as specified in the AHA been implemented?
12. Are the corrective measures as implemented effective in mitigating or eliminating hazards?

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PERFORMANCE ATTRIBUTE: IV. The laboratory has ensured that each employee entering the worksite has, through experience, training, and, where required, certification, the skills and knowledge necessary to safely perform his or her assigned tasks.

LINES OF INQUIRY:

1. Does each employee receive an initial safety and health orientation prior to performing any work on the project worksite?
2. Does the orientation address, as a minimum, the following points:
 - a. Employee rights and responsibilities?
 - b. Laboratory responsibilities?
 - c. Use and maintenance of required personnel protective equipment?
 - d. Disciplinary measures?
 - e. Alcohol and drug abuse policy?
 - f. First aid and medical facilities?
 - g. General project hazards and the applicable policies and procedures for addressing those hazards?
 - h. Hazard recognition and procedures for reporting or correcting unsafe conditions or practices?
 - i. Procedures for reporting accidents and incidents?
 - j. Fire prevention and control?
 - k. Emergency response procedures to include local warning and evacuation systems?
 - l. Hazard communication program?
 - m. Access to employee exposure monitoring data and medical records?
 - n. Location of and access to approved project safety and health plan?
 - o. Site occupational safety and health programs applicable to the project (e.g., lockout/tagout, confined spaces)?
3. Is the orientation training provided at least annually after the initial orientation?
4. Is the orientation training documented to indicate the content of the training and the date, name, and signature of those attending the training?
5. Does the laboratory conduct pre-phase training before beginning any phase of work?
6. Does the pre-phase training include review of the Activity Hazards Analysis and

- training of employees on the potential hazards and the required protective measures for those activities?
7. Is the Activity Hazard Analysis annotated with the name, signature, and date of attendance of workers who attended the pre-phase training?
 8. Is additional pre-phase training conducted as needed for new employees, as a result of changing site conditions, or to reinforce project safety and health requirements?
 9. Does the laboratory conduct informal "toolbox" safety and health training sessions at least weekly for all employees at the worksite?
 10. Are "toolbox" training sessions documented including an outline of the training and the date, time, and names of all employees attending the training?

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PERFORMANCE ATTRIBUTE: V. The laboratory conducts worksite inspections and implements hazard abatement actions as needed.

LINES OF INQUIRY:

1. During periods of active construction, does the laboratory conduct daily inspections of the worksite to identify hazards and instances of non-compliance with project safety and health requirements?
2. Do personnel performing the inspections meet stated qualification/training requirements?
3. Does the laboratory maintain records of all daily inspections?
4. Do the inspection records indicate all observed hazards and the corrective actions taken?
5. Does the laboratory take immediate actions to eliminate or control all identified hazards?
6. In those cases where immediate corrective action is not possible or responsibility for abatement falls outside the scope of the project, does the laboratory:
 - a. Notify all affected employees of the hazard and its location?
 - b. Immediately post warning signs at the location of the hazard describing the nature of the hazard?
 - c. Implement further interim control measures, as needed, to protect employees from the identified hazards and secure construction manager approval for continued use of the employed measures?
 - d. Notify the construction manager of the location and description of the hazard?

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PERFORMANCE ATTRIBUTE: VI. Uses of scaffolding are effectively controlled to ensure the safety of workers performing activities above the ground.

LINES OF INQUIRY:

1. Is scaffolding designed, erected, moved, and dismantled only under the direction of a competent person?
2. Is use of shore scaffolds or lean-to scaffolds prohibited?
3. Is scaffolding supported or anchored in a stable configuration that is capable of carrying the maximum intended weight without displacement?
4. Do workers use an access ladder or built-on scaffold ladder to reach their work areas?
5. Are workers below the scaffold protected from the potential of falling objects by toe boards, wire mesh, solid planking, or overhead protection?
6. For scaffolds over 10 feet high, are standard guard rails and toe boards installed on all open sides and ends of the scaffold?
7. Are scaffolds free from any indication that they or their accessories are damaged or weakened?
8. Are scaffolds free of tripping hazards and slippery conditions?

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PERFORMANCE ATTRIBUTE: VII. Personnel at construction sites are using appropriate personal protective equipment.

LINES OF INQUIRY:

1. Has management established appropriate policies regarding use of personal protective equipment and communicated these policies to workers?
2. Are workers and visitors wearing non-conductive hard hats that conform to ANSI Z89.1-1969 (standard use) or ANSI Z89.2-1971 (electrical use)?
3. Are hard hats labelled to demonstrate compliance with the appropriate standards?
4. Are all workers and visitors at construction sites wearing safety glasses or spectacles?
5. Are workers who are performing tasks that entail additional hazards to eyes wearing additional eye and face protection commensurate with the hazard?
6. Are workers who are handling sharp instruments, rough materials, or chemicals or who may be exposed to hazards such as friction, heat or electricity wearing appropriate gloves to protect their hands?
7. Are workers and visitors who may be exposed to foot hazards wearing safety shoes or boots with protective toes that meet requirements of ANSI Z 41.1-1967?
8. Are workers who are exposed to sustained noise in excess of 90 dBa provided with appropriate hearing protection devices such as ear muffs or ear plugs?
9. Is fall protection provided for workers who work at heights over six feet?
10. Are workers trained in use and inspection of safety harnesses, lanyards, etc.?
11. Are all ropes and lanyards inspected for damage?
12. Are safety harnesses and lifelines used for elevated construction work and in operations in which the worker does not have complete fall protection?
13. Are safety nets used where ladders, scaffolds, temporary floors, catch platforms, or lifelines are not practical?

14. Are safety nets inspected before installation and daily thereafter?
15. Are safety nets used for worker protection where unguarded workplaces exist for work at heights over 25 feet above the surface?

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PERFORMANCE ATTRIBUTE: VIII. Effective controls are implemented to protect workers in excavations and trenches.

LINES OF INQUIRY:

1. Has the site been cleared of hazardous conditions that could cause cave-ins of excavations?
2. Have all underground installations such as sewers, telephone lines, electric lines, or fuel, natural gas, or water pipelines been located and marked before excavation work begins?
3. Are hazards associated with underground installations abated before excavation work begins? (e.g., electric lines de-energized, natural gas systems de-pressurized, etc.)
4. Are workers prohibited from areas in which lifting or digging equipment is in use, including areas with active digging operations, areas where material is mechanically lowered or raised, and areas where vehicles are being loaded or unloaded?
5. Are safe entry and exit provided for excavations?
6. Does a competent person who has the authority to abate hazards inspect the excavation daily for hazards that could result in cave-ins or hazardous atmospheres?
7. Are excavations shored or braced when the stability of adjoining structures is endangered?
8. Are provisions adequate to ensure that materials and equipment will not roll or fall into the excavation?
9. Are physical barriers provided around excavations?
10. For excavations greater than five feet in depth, has an adequate protective system been installed to protect workers from possible cave-ins?

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PERFORMANCE ATTRIBUTE: IX. An effective program is established to protect construction workers from electrical hazards.

LINES OF INQUIRY:

1. Have all electrical hazards at a construction site been identified and appropriately posted?
2. Are workers precluded from performing work in areas with energized electrical circuits?
3. If work must be performed in the vicinity of live electrical circuits, are workers adequately protected against shocks?
4. Is electrically powered equipment free of recognized hazards?
5. Is electrically powered equipment connected only to approved outlets or electrical sources that meet 29 CFR 1926 Subpart K?
6. Are electric power tools grounded or double insulated?
7. Are extension cords in use continuous without splices, protected from pinching or abrasion, and clearly marked to identify type, size, and number of conductors?
8. Are clearances in front of electrical cabinets maintained?
9. Is the location of underground electric power systems known before ground is broken with jack hammers, shovels, metal bars, etc.?
10. Are workers trained in electrical safety-related work practices and hazard recognition?
11. Are only qualified workers permitted to work on equipment or circuits that have not been de-energized and to use test instruments in performing tests on circuits or equipment?
12. Are circuits or equipment de-energized and locked or tagged out to prevent accidental energization before work begins?
13. Do workers verify that equipment is de-energized before beginning work?

14. Is the construction site protected by ground-fault circuit interrupters?
15. Where ground-fault circuit interrupters are not installed, is an assured grounding program in effect?

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PERFORMANCE ATTRIBUTE: X. The laboratory has implemented an effective program to ensure safety of personnel involved in hoisting and rigging operations.

LINES OF INQUIRY:

1. Are all cranes and hoists constructed, erected, inspected, tested, and operated in accordance with manufacturer instructions?
2. Are required tests and inspections conducted by qualified personnel and documented?
3. Is maintenance recommended by the manufacturer performed?
4. Are defects identified during inspections promptly corrected?
5. Are repairs or maintenance activities performed in a safe location with the crane or hoist off and appropriate lockout/tagout implemented?
6. Are daily visual inspections performed for wire rope slings, chain slings and synthetic web slings?
7. Are all slings stored correctly?
8. Are wire ropes and chains appropriately lubricated?
9. Are crane and hoist operators trained, qualified, and appropriately certified to operate the equipment?
10. Are load limits for cranes and hoists known, posted, and observed?
11. Is load swing avoided?
12. Are tag lines in use to control suspended loads?
13. Are only slings used around loads?
14. Does the operator remain at the controls when loads are suspended?
15. Are gears, shafts, sprockets, chains, and other hazardous parts covered or guarded?
16. Are warning signals and alarms known, posted, and observed?

17. Is the swing radius barricaded to exclude workers?
18. Is a single employee designated as the crane signalman? Is the signalman clearly distinguishable from other personnel?
19. Does the operator ensure that loads are never carried over workers?
20. Are load-hoisting brakes installed and capable of holding the required, rated load?

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PERFORMANCE ATTRIBUTE: XI. A program has been established to ensure safety during welding and cutting activities.

LINES OF INQUIRY:

1. Are compressed gas cylinders used for welding stored, handled, and moved properly?
2. Are valves closed and protective caps in place for cylinders of compressed gases that are temporarily stored?
3. Are welding fuel gas and oxygen protected from electric currents, heat, sparks, contact with electrical arcs, hazardous materials, and hazardous weather? Are fuel gas and oxygen cylinder stored 20-feet apart, or separated by a fire resistant wall?
4. Are torches inspected daily?
5. Are regulators maintained in good condition?
6. Are oxygen cylinders, fittings, connectors, and manifolds free of oil and grease?
7. Are current-carrying parts of arc welding equipment such as hand grips, outer surfaces and jaw backs insulated against maximum ground voltage?
8. Are cables with cut insulation, exposed wires, bare metal lugs or insulation pulled back at the ends repaired before use?
9. Are grounds for arc welding adequate?
10. Are welders adequately trained in welding procedures and precautions?
11. Are adequate disconnects provided for arc welders?
12. Are flammable and toxic coatings removed before welding operations?
13. Are ventilation systems adequate to reduce welding air contaminants to acceptable limits?
14. Are arc welding operations properly shielded?
15. Are welders wearing appropriate eye and/or face protection?

16. Is a fire watch maintained for at least ½ an hour after welding is completed?
17. Are fire extinguishers provided near welding?