

NUCLEAR SAFETY PROGRAM

1.0 Objective

The objective of this performance assessment is to evaluate the effectiveness of the laboratory's nuclear safety program as implemented in the facility. For this assessment, the nuclear safety program includes (1) the preparation and maintenance of safety analysis reports and technical safety requirements; (2) evaluating the potential for unreviewed safety questions; (3) facility nuclear safety review committees and; (4) criticality safety. The Facility Representative or Environmental, Safety, and Health Support Specialist examines policies, procedures, and programs implemented in the facility. To evaluate the effectiveness of implementation, the Facility Representative or Environmental, Safety, and Health Support Specialist observes work activities, interviews personnel, performs walkdowns, 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

- 4.1 DOE O 420.1, *Facility Safety*
- 4.2 DOE O 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*
- 4.3 DOE 5480.21, *Unreviewed Safety Questions*
- 4.4 DOE 5480.22, *Technical Safety Requirements*

4.5 DOE 5480.23, *Safety Analysis Reports*

4.0 Performance Assessment Activities

The assessor reviews selected program documents including policies, procedures, program plans, and safety review committee charters before beginning the assessment. Appendix A provides a suggested list of documents that the assessor may review during preparations for the assessment.

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 facility is meeting the performance attributes, the assessor completes a range of activities such as reviews of facility documents, interviews with facility and support staff personnel, observations of facility activities, and walkdowns of the facility. Appendix B provides a listing of suggested performance attributes and lines of inquiry. In conducting this assessment, the assessor may also draw upon surveillance guides prepared for the nuclear safety functional area. The following guides are available:

NSS 18.1	Criticality Safety
NSS 18.2	Technical Safety Requirements
NSS 18.3	Verification of Authorization Basis Documentation

The Nuclear Safety area includes criticality hazards that may create risks to both DOE's workers and the public, and mitigation of the risks posed to the public or the environment due to the potential release of radioactive materials. Radiological hazards that may pose risks to DOE's workers are treated separately in assessments of radiological protection completed as part of the Conduct of Operations assessment program.

The emphasis of this assessment is on the effectiveness of the laboratory's nuclear safety program as implemented in a specific facility. In performing the assessment, the assessor must balance review of site-wide programs, facility-specific policies and procedures, and "on-the-ground" implementation. The following questions provide the general framework that should be used in planning, conducting and documenting the assessment:

- Do the laboratory's site-wide nuclear safety programs provide an effective mechanism for identifying, analyzing, and where necessary, mitigating nuclear hazards including criticality hazards?
- Do the laboratory's site-wide nuclear safety programs ensure that effective administrative controls are established to ensure nuclear and criticality safety at each facility?

- Has the facility effectively implemented the site-wide programs?
- Are routine activities in the facility consistent with nuclear and criticality safety programs and are they performed so that the public and DOE's workers' safety and health are protected?
- Have effective safety review processes been established to protect the integrity of the authorization basis?

APPENDIX A

POSSIBLE DOCUMENTS TO BE REVIEWED

Site-wide Safety Analysis Report Upgrade Program Plan
Criticality Safety Manual
Technical Safety Requirements Program Plan
Facility Safety Analysis Report
Interim safety bases
Facility technical safety requirements
Site-wide nuclear safety policy
Site-wide procedures for performing unreviewed safety question determinations
Facility nuclear safety policy
Facility criticality safety limits
Facility safety review committee charters
Facility procedures for performing unreviewed safety question determinations
Facility occurrence reports relating to nuclear or criticality safety
Non-conformance reports relating to nuclear safety
Internal and external audit, inspection and assessment reports

APPENDIX B

PERFORMANCE ATTRIBUTES AND LINES OF INQUIRY

PERFORMANCE ATTRIBUTE: I. The laboratory's organization, administration and management provides for effective implementation of the nuclear safety programs.

LINES OF INQUIRY:

1. Are nuclear safety program roles, responsibilities, authorities, and accountabilities clearly communicated and understood by line management, support staff, and workers at the facility?
2. Are supporting management systems such as job descriptions, performance standards, and performance appraisals implemented to ensure effective implementation of nuclear safety roles and responsibilities?
3. Do nuclear safety program managers have sufficient organizational stature, independence, and authority to effectively implement nuclear safety programs and to make decisions related to nuclear safety?
4. Do personnel responsible for the direction of the nuclear safety program have the appropriate qualification, experience, and training to implement the established program?
5. Are interfaces and areas of joint responsibility between site support organizations, facility support staff, and line management clearly defined to ensure that all organizations support implementation of the nuclear safety program?

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PERFORMANCE ATTRIBUTE: II. The laboratory has committed required resources to effectively implement the nuclear safety program.

LINES OF INQUIRY:

1. Does the laboratory budget provide sufficient resources so that all nuclear safety responsibilities can be fulfilled?
2. Does the laboratory have a long-term and short-term staffing plan to ensure that nuclear safety responsibilities will be met?
3. Do the staffing plans include provisions for ongoing training and professional development of nuclear safety staff and management?
4. Does the laboratory staffing level meet the existing staffing plan?
5. Does the laboratory's budget include funds to correct recognized weaknesses in the nuclear safety program, and to mitigate or eliminate recognized hazards?

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PERFORMANCE ATTRIBUTE: III. A Safety Analysis Report provides a thorough analysis of nuclear hazards to the public and the environment and potential criticality hazards for DOE's workers, the public and the environment.

LINES OF INQUIRY:

1. Does the safety analysis identify the nuclear safety hazards at the laboratory, provide a thorough analysis of the hazards, and establish requirements for hazard mitigation through a balance of engineered safeguard features and administrative requirements?
2. Have mechanisms been established to ensure that the safety analysis report is routinely updated to reflect changes in design, operations, and maintenance?
3. Are effective controls implemented to ensure that copies of the Safety Analysis Report in use contain the most current information?
4. Does the Safety Analysis Report reflect the current configuration and mission of the laboratory?
5. Does the Safety Analysis Report clearly identify critical assumptions made in the safety analyses including assumed inventories of radioactive, fissile, or hazardous materials?
6. Are revisions to the Safety Analysis Report submitted at least annually for review and approval?

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PERFORMANCE ATTRIBUTE: IV. Technical Safety Requirements have been developed and implemented that prescribe the bounds of safe operation to protect the health and safety of the public and reduce risk to workers.

LINES OF INQUIRY:

1. Do Technical Safety Requirements provide effective controls over key elements of the safety analysis report?
2. Are Technical Safety Requirements implemented in facility procedures and instructions?
3. Are Technical Safety Requirements reviewed at least annually?
4. Are Technical Safety Requirements consistent with the current configuration of the facility?
5. Have effective controls been implemented to ensure that copies of Technical Safety Requirements contain the most current information?
6. Have the Technical Safety Requirements used for operating the facility been approved by the Cognizant Secretarial Official?
7. Have administrative controls been established and implemented to ensure that changes to the Technical Safety Requirements are submitted to Cognizant Secretarial Official for approval and are not implemented without prior approval?

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PERFORMANCE ATTRIBUTE: V. The laboratory has implemented an effective process to ensure that physical or procedural changes or tests and experiments do not result in operations outside the authorization basis without prior approval of DOE management.

LINES OF INQUIRY:

1. Has the laboratory established procedures that require a formal safety evaluation of all proposed changes in the facility and tests or experiments not described in the safety analysis report to identify possible unreviewed safety questions?
2. Has the laboratory defined the documents that constitute the authorization basis and communicated this information to safety evaluation preparers and reviewers?
3. Are safety evaluations performed for all changes that might involve altering the authorization basis including:
 - a. Temporary or permanent changes in the facility as described in the safety analyses?
 - b. Temporary or permanent changes in the procedures as described in existing safety analyses?
 - c. Tests or experiments not described in existing safety analyses?
 - d. Information that indicates a potential inadequacy of previous safety analyses?
 - e. A possible reduction in the margin of safety as defined in the Technical Safety Requirements?
4. If the laboratory has established screening criteria to limit the number of required written safety evaluations, are the criteria fully consistent with requirements in DOE 5480.21?
5. Has the laboratory established appropriate qualification and training requirements for personnel performing screening and safety evaluations?
6. Does the laboratory's training program for performing safety evaluations provide sufficient information?

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PERFORMANCE ATTRIBUTE: VI. The laboratory has established an effective safety review committee to oversee nuclear safety.

LINES OF INQUIRY:

1. Has a formal charter for the committee been prepared, approved, and issued that defines responsibilities, authority, composition, quorum and documentation responsibilities?
2. Does the safety review committee meet routinely?
3. Are detailed records maintained documenting the results of the safety review committee's evaluations?
4. Does the safety review committee membership include members with diverse technical capabilities such that the committee can fulfill its charter and conduct multi-disciplined reviews with necessary technical competence?
5. Does the safety review committee evaluate:
 - a. Incidents and accidents involving significant safety problems?
 - b. Selected Unusual Occurrence Reports?
 - c. Facility, process, equipment or instrumentation modifications and any other changes to safety-related systems or components?
 - d. Changes to and violations of Technical Safety Requirements?
 - e. Proposed experimental programs?
 - f. Safety evaluations for unreviewed safety question determinations?
 - g. Selected changes to facility procedures, policies, or programs?
6. Are recommendations from the safety review committee submitted to top laboratory management?
7. Does management document the reasons for rejecting recommendations from the safety review committee?

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PERFORMANCE ATTRIBUTES AND LINES OF INQUIRY

PERFORMANCE ATTRIBUTES: VII. The laboratory has established and implemented an effective program and appropriate policies and procedures to protect the public and DOE's workers from criticality hazards.

LINES OF INQUIRY:

1. Has the laboratory established a formal, documented criticality safety program?
2. For each process or activity involving potential criticality hazards, have adequate engineering or administrative controls been established?
3. Are process criticality limits based on experimental data or on results of validated calculational techniques?
4. For all work activities involving potential criticality hazards, have written procedures identifying criticality safety limits been prepared?
5. Are new or revised procedures that may affect nuclear criticality safety reviewed by criticality safety specialists?
6. Do process designs incorporate sufficient factors of safety such that at least two unlikely, independent and concurrent changes in process conditions are required before criticality is possible?
7. Has a monitoring and surveillance program been established to prevent accumulation of fissionable materials in storage, pipe, and ventilation systems and in process equipment?

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PERFORMANCE ATTRIBUTES AND LINES OF INQUIRY

PERFORMANCE ATTRIBUTES: VIII. Personnel who work with fissile materials have been adequately trained on procedures, administrative controls and emergency response.

LINES OF INQUIRY:

1. Have personnel working with fissile materials been trained on criticality safety limits and procedures?
2. Can personnel working with fissile materials explain why criticality safety limits have been established and what might happen if limits were exceeded?
3. Can personnel describe how they would be warned of a criticality incident including the type of alarm?
4. Can personnel describe the required response if a criticality alarm is activated?
5. Are personnel who handle fissile materials trained on revisions to procedures, and criticality safety limits?
6. Do personnel who work with fissile materials receive continuing training and retraining at specified intervals?