



**OFFICE OF SAFETY AND  
EMERGENCY MANAGEMENT EVALUATIONS PROTOCOL  
FOR  
HIGH-HAZARD NUCLEAR FACILITY  
PROJECT OVERSIGHT**

**November 2012  
Office of Enforcement and Oversight  
Office of Health, Safety and Security  
U.S. Department of Energy**

**Office of Safety and Emergency Management Evaluations  
Protocol for High-Hazard Nuclear Facility Project Oversight**

**November 2012**

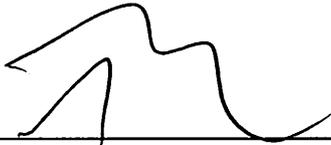
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## 1.0 PURPOSE

The purpose of this protocol is to establish the requirements and responsibilities for managing and conducting Office of Health, Safety and Security (HSS) independent oversight of high-hazard nuclear facility projects. As part of the Department of Energy's (DOE) self regulatory framework for safety and security, DOE Order 227.1, *Independent Oversight Program*, assigns HSS the responsibility for implementing an independent oversight program. It also requires the HSS Office of Enforcement and Oversight to conduct independent evaluations of safety and security. This protocol provides the requirements and responsibilities for conducting and managing HSS independent oversight of high-hazard nuclear facility construction or major modification projects in accordance with the provisions of DOE Order 227.1.

## 2.0 APPLICABILITY

This protocol is applicable to the Office of Safety and Emergency Management Evaluations assessments of high hazard nuclear projects. This protocol applies to all HSS oversight activities involving high-hazard nuclear facility projects. "Nuclear facility projects" as used in this protocol refer to any new (or significant modification to a) nuclear facility meeting the threshold of a capital asset project delineated in the latest approved revision of DOE Order 413.3, *Program and Project Management for the Acquisition of Capital Assets*.

## 3.0 REQUIREMENTS

### General

- HSS Office of Safety and Emergency Management Evaluations inspection activities involving high-hazard nuclear facility projects are to be performed in accordance with DOE Order 227.1, *Independent Oversight Process*, and applicable Office of Safety and Emergency Management Evaluations protocols; guides; and criteria, review, and approach documents (CRADs). The most recent revisions of the HSS protocols, guides, and CRADs can be found at [http://www.hss.doe.gov/indepoversight/safety\\_emergencymgt/guidance.html](http://www.hss.doe.gov/indepoversight/safety_emergencymgt/guidance.html).
- HSS Independent Oversight activities are not structured to thoroughly review all aspects of the project, but rather selected to strategically focus on aspects of nuclear safety areas that are particularly essential to ensuring effective protection of workers and the public. The sampling strategy considers the nuclear facility hazard category rating, the complexity of the project, past performance, and the status of site design and construction activities. The strategic sampling approach enables HSS to focus on the processes and items that are most important to safety.
- Reviews are conducted at the optimal time (e.g., reviewing the quality assurance for structural concrete when concrete pours are being performed).
- Reviews are coordinated with project management and scheduled to the extent practical for efficiency and to reduce unnecessary impact on mission activities through alignment with the project schedule (e.g., conducting reviews of safety basis documents concurrent with Federal line management reviews).

- The selected team members must possess qualifications, competencies, and experience commensurate with their intended responsibilities and must be free of any real or perceived conflict of interest.
- When differences in scheduling of activities or issue resolution arise with the organization or project being reviewed, they are raised to the next level of management in accordance with DOE O 227.1, *Independent Oversight Program*.
- HSS independent oversight of design, construction, commissioning, and startup of high-hazard nuclear facilities will be conducted as part of the HSS Site Lead Program (Reference *Office of Safety and Emergency Management Evaluations Protocol for Site Leads*).
- Reviews of high-hazard nuclear projects will be performed and documented in accordance with the requirements of the *Office of Safety and Emergency Management Evaluations Protocol for Small Team Oversight Activities*.
- Key issues, activities, changes, priorities for oversight, schedules of oversight activities and items for monitoring or follow-up for projects will be included in Site Lead Status Reports as specified in Appendix B of the *Office of Safety and Emergency Management Evaluations Protocol for Site Leads*.
- The HSS Office of Safety and Emergency Management Evaluations may use the approach presented in this protocol for appraisal activities involving moderate or low-hazard nuclear facility projects using a graded approach as long as those activities are performed in accordance with DOE Order 227.1, *Independent Oversight Process*.

#### Oversight Activities

- HSS reviews of nuclear facility projects include (but are not limited to) targeted reviews, small-scope appraisals, concurrent reviews, shadowing of line or contractor oversight activities, and operational awareness activities. These are further defined in Appendix C of the *Office of Safety and Emergency Management Evaluations Protocol for Small Team Oversight Activities*. All HSS Independent Oversight activities will be performed and documented in accordance with the established HSS protocols. To ensure maximum effectiveness of the oversight process, oversight activities will be planned in coordination with the Federal Project Director (or designee) and aligned with project milestones where appropriate (e.g. safety basis reviews).
- The HSS Independent Oversight sampling approach and operational experience activities for nuclear facility projects focuses on the following five general areas as appropriate for a specific project:
  - **Safety Basis/Design** – These reviews focus on evaluating the process of integrating nuclear safety into the facility design from the conceptual stage through the final design stage. The reviews also focus on evaluating the principal products of the design process such as design calculations, as-built drawings, and the safety basis of the facility including the documented safety analysis and the technical safety requirements. Reviews of the safety basis include the selection and application of the appropriate codes and standards for the project. Specific review areas include: identification and evaluation of hazards associated with the facility; derivation and adequacy of hazard controls; and translation of design basis requirements into operational controls

including translation of hazards analysis requirements to controls for safety related systems, structures, and components.

- **Quality Assurance** – These reviews focus on evaluating the establishment of quality assurance processes and determining whether construction and commissioning activities that are important to safety are conducted in accordance with established quality assurance requirements. Specific areas reviewed are based on the stage of the project and typically include: design control; procurement, including control of purchased items and services; inspection and testing; and control of nonconforming items, corrective actions, and audit processes.
- **Construction Quality** – These reviews focus on the most important structures, systems, and components and are used to provide assurance that the technical requirements specified have been adequately captured in construction documents. They also focus on ensuring that work and inspections are being accomplished in accordance with these requirements, records are kept and deficiencies are addressed. Areas reviewed are based on the stage of the project and typically include: structural concrete; structural steel and supports; piping and supports; mechanical equipment installation; electrical supply and backup power distribution components and instrumentation and control for major systems.
- **Start-up/Readiness** – These reviews include “shadowing” selected aspects of line management operational readiness reviews. Operational readiness reviews are structured multidisciplinary activities conducted by line management to assure that a new facility or significantly modified facility can be operated safely within the approved safety basis. “Shadowing” is an assessment technique in which HSS personnel observe a line management oversight activity to evaluate compliance with safety requirements and to observe the effectiveness of the DOE line management oversight.
- **Start-up Program/Turnover** – These reviews focus on evaluation of the facility’s performance of the approved start-up program following DOE approval for operations, including oversight of the initial graded operations and testing up to full operations. Areas reviewed typically include: confirmation of equipment operability; viability of procedures (including safety basis implementing procedures); performance and knowledge of the operators; initial introduction of the nuclear hazard into the facility; compliance with any restrictions or compensatory measures required during the approach to full operations; and where applicable, the turnover process from the construction and/or commissioning contractor(s) to the operating contractor.
- Reviews of safety basis submittals will be conducted in parallel with Federal line management reviews. Because of review schedules associated with projects it may be necessary to provide comments prior to issuing a report documenting the review activity. When this occurs, comments will be documented using a comment review form that clearly identifies the comment, technical basis, and reviewing organization. In most cases, line management review forms will be used. All comments from Independent Oversight will clearly indicate that they are HSS independent oversight comments. The comments will be reviewed by the Director or Deputy Director Office of Safety and Emergency Management Evaluations prior to issue to the site. Reports documenting the review will be issued at a later time.

- Similarly, reviews of other types of project work documents, such as procurement documents may be time and project sensitive, and may require providing comments before issuing a report documenting the review activity. When this occurs, comments will be formally documented that clearly identifies the comment, technical basis, and reviewing organization as noted above. The comments will also be included a separate appendix to the issuing report.

#### **4.0 RESPONSIBILITIES**

##### Director, Office of Enforcement and Oversight

- Approves plans for independent oversight reviews of high-hazard nuclear facility projects.

##### Director, Office of Safety and Emergency Management Evaluations

- Assigns appropriate Office of Safety and Emergency Management Evaluations technical staff to perform HSS Independent Oversight of high-hazard nuclear facility projects.
- Ensures that team members possess qualifications, competencies, and experience commensurate with their assignments and are free of any real or perceived conflicts of interest.
- Ensures that plans and Criteria Review and Approach Documents are developed and used for nuclear project review activities.
- When differences regarding schedules of activities or the resolution of issues arise, works with line management to resolve. When differences cannot be resolved, raises them to the Director of Enforcement and Oversight.
- Approves review and operational awareness activities.
- Ensures the quality of review products.

##### HSS Site Lead or Designee

- Coordinates with the Federal Project Director (or site or program office POC, as applicable) to include reviews of high-hazard nuclear facility projects in the development of site-specific or project-specific charters/review plans.
- Maintains operational awareness of site issues and programs and selectively performs or coordinates additional independent oversight activities to determine whether high-hazard nuclear facilities are designed, constructed, commissioned, and started up in accordance with the applicable nuclear safety requirements.

#### **5.0 REFERENCES**

- DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*
- DOE Order 227.1, *Independent Oversight Program*
- DOE Order 413.3B, *Program and Project Management for the Acquisition of Capital Assets*
- DOE Order 414.1D, *Quality Assurance*
- DOE Standard 1189-2008, *Integration Of Safety Into The Design Process*

- 10 CFR Part 830, *Nuclear Safety Management*
- *Office of Safety and Emergency Management Evaluations Appraisal Process Guide*, July 2009.
- *Office of Safety and Emergency Management Evaluations Protocol for Small Team Oversight Activities*, June 2012 (Rev. 1)
- *Office of Safety and Emergency Management Evaluations Protocol for Site Leads*, May 2011