

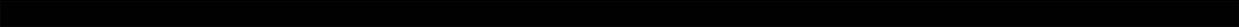


**U.S. Department of Energy
National Nuclear Security Administration**

**Initial Implementation Assessment
of the
Livermore Site Office
Safety System Oversight Program**

Final Report

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Assessment Team

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EXECUTIVE SUMMARY

Initial implementation of the Safety System Oversight (SSO) function being established at the Livermore Site Office (LSO) was reviewed by two Federal Technical Capability Agents to assess efforts to implement the program using criteria developed by the Federal Technical Capability Panel. The LSO SSO Program Plan describes a process to implement the SSO function which meets the requirements of DOE M 426.1-1A. LSO is just beginning the implementation of the Program Plan. The LSO SSO program does fully meet the following objectives;

- 1) An effective SSO Program is established by the Field Element Manager to apply engineering expertise to maintain safety configuration and to assess system condition.
- 2) SSO personnel and supervisors with responsibilities for SSO personnel are appropriately trained and qualified, or are in the process of achieving qualification.
- 3) SSO Supervisors effectively perform their SSO program responsibilities.

Currently implementation has not progressed far enough to determine if the LSO SSO program fully meets the objectives of;

- 1) SSO personnel provide oversight of the Contractors' System Engineer Program
- 2) SSO personnel are knowledgeable and familiar with assigned safety systems.

Several Opportunities for Improvement listed below were identified during the review:

- 1) Program Plan should be revised to address the following comments:
 - Define the system for maintaining configuration on the vital safety systems list.
 - Clarifying responsibilities for follow-up on deficiencies identified by SSO personnel.
 - Add more specificity regarding the level of oversight to be performed.
- 2) Modify SSO personnel performance plans to specifically include their SSO duties.
- 3) Modify Operational Awareness Plans, or other documents to specify SSO oversight activities.

INTRODUCTION

In May 2004, the Department of Energy (DOE) institutionalized the Safety System Oversight (SSO) function to monitor the performance of systems relied upon to assure safe operation of nuclear facilities and evaluate effectiveness of the Contractor's cognizant system engineer program. The SSO function, including roles and responsibilities of personnel assigned this function, are described in DOE M 426.1-1A, *Federal Technical Capability Panel Manual*. DOE M 426.1-1A also defines the knowledge, skills and abilities to be incorporated into technical qualification programs for personnel assigned the SSO function.

The objective of this review is to assess initial actions taken by the Livermore Site Office (LSO) to implement the SSO function. The reporting format described in DOE M 426.1-1A was used to document the review results.

SCOPE and METHODOLOGY

The review was performed by the LSO Federal Technical Capabilities Panel (FTCP) Agent and the FTCP Agent from the Nevada Site Office. Criteria and Review Approach Documents (CRADs) developed by the FTCP were used to assess actions initially taken to define and implement the SSO function at LSO. Full implementation at LSO will be assessed by the FTCP before the end of FY05. The CRADs are located in Attachment A of this report.

The results of document reviews and interviews are documented in the "Results" section of this report and broken out by the four CRAD functional areas: Program (PGM); Training and Qualification (TQ); Management (MG); and Oversight Performance (OP).

PGM, TQ and MG functional area assessment consisted of document review and management interviews assessing LSO action to implement the SSO functions described in DOE M 426.1-1A. Since the SSO program has not yet been fully implemented, the OP functional area consisted of SSO personnel interviews to confirm understanding of Program Plan requirements and assess actions being taken to provide this oversight.

Documents reviewed:

- NNSA/LSO Standard Operating Procedure "Technical Qualification Program", approved September 27, 2004.
- NNSA/LSO Standard Operating Procedure "Federal Safety System Oversight Program", approved June 7, 2004.
- NNSA/ LSO Safety System Oversight Personnel Qualification Standard, approved May 6, 2004.
- NNSA/LSO Safety System Oversight Personnel Qualification Plan, approved September 16, 2004.

- Memorandums from Acting Assistant Manager for Livermore Safety Operations Division to SSO Personnel “Notification of Assignment of LSO Safety Systems Oversight Personnel Technical Standard”, dated July 7, 2004.

Personnel interviewed include:

- SSO Personnel Supervisors (2)
- Safety System Oversight Program Manager
- LSO Safety System Oversight Personnel (2)
- LSO Facility Representative (1)

RESULTS

Program (PGM)

The review performed under this functional area addressed actions taken by the LSO to establish the SSO function and describe its implementation.

The SSO function established at LSO is defined by the NNSA/LSO Standard Operating Procedure “Federal Safety System Oversight Program” (Program Plan). The Program Plan was issued on June 7, 2004. The Program Plan represents LSO management’s intent to develop and implement a program to oversee the contractor’s system engineering program required by DOE Order 420.1A, “Facility Safety”. Section 3.1.6 of the Program Plan describes inclusion of SSO qualifications as part of the Technical Qualification Program. The roles, responsibilities and authorities of personnel assigned SSO responsibilities are described in section 2 of the Program Plan. Roles, responsibilities and functions described in the Program Plan are consistent with, and duplicate, the content of DOE M 426.1-1A.

Personnel assigned SSO responsibilities were identified in the memorandums listed above. The list of vital safety systems is maintained under configuration management by requiring concurrence on changes from the SSO Manager, the Nuclear Safety Team Leader, and the Configuration Management Subject Matter Expert (who is the POC for DNFSB 2000-2). However, this process is not captured in the Program Plan. The list captures passive systems and defense in depth systems in addition to safety class and safety significant systems identified in the Documented Safety Analyses.

NNSA/ LSO Safety System Oversight Personnel Qualification Standard and NNSA/LSO Safety System Oversight Personnel Qualification Plan describe LSO processes to qualify SSO candidates and evaluate their level of knowledge. The process requires candidates to complete a separate qualification card developed for each assigned safety system. Level of knowledge regarding qualification card competencies is confirmed by a qualifying official through practical demonstration or written or oral examinations. This process meets the expectations of DOE M 426.1-1A.

Interviews were conducted to assess understanding of the SSO role. Supervisory expectations were generally consistent with the LSO Program Plan. However, while these expectations are mentioned generically in SSO personnel's performance plans as part of their oversight expectations, specific goals for the implementation of their SSO responsibilities are not covered. The one exception is the SSO Program Manager.

A staffing analysis for SSO personnel is currently being completed by LSO in accordance with FTCP guidance. The draft of this analysis indicates the SSO program is adequately staffed.

Training and Qualification (TQ)

The review performed under this functional area addressed actions taken to ensure SSO personnel and supervisors with responsibilities for SSO personnel are appropriately trained and qualified. Section 2.3 of the Program Plan identifies those supervisors with responsibilities for SSO personnel need to qualify as Senior Technical Safety Managers (STSM). Some supervisory duties for some SSO personnel are performed by Team Leads within the Livermore Safety Operations Division. These Team Leads are qualified under a LSO local standard, Technical Safety Manager, which is modeled on the STSM standard

All assigned LSO SSO personnel have qualified or are in the process of qualifying under the General Technical Base standard and a functional area qualification standard. LSO SSO personnel, with one exception, have not made any progress in qualifying under the LSO SSO standard. The assigned due date for qualification to the SSO qualification standard is March 31, 2006.

The SSO qualification processes are in accordance with the NNSA/LSO Standard Operating Procedure "Technical Qualification Program" (TQP SOP). SSO qualification to the NNSA/ LSO Safety System Oversight Personnel Qualification Standard is guided by the NNSA/LSO Safety System Oversight Personnel Qualification Plan. The standard has four competencies that must be met once for all systems assigned and five competencies that must be met for each system assigned. Demonstration of competency is through oral or written examination or practical demonstration. Qualification Officials are LSO Subject Matter Experts, Facility Representatives, and Nuclear Safety Analysts depending on the competency.

Management (MG)

The review performed under this functional area assessed actions being taken to ensure SSO supervisors effectively perform their responsibilities. The process used to maintain configuration of the list of vital safety systems (discussed above) ensures that the systems are consistent with those credited in the DSAs. This list also names personnel assigned SSO responsibilities for the individual systems. Personnel are notified by their supervisor of any changes in their assignment due to changes in the list are then notified of any changes in their qualification requirements through the process identified in the

TQP SOP. Progress of personnel towards meeting their qualification requirements are discussed at Technical Qualification Council (TQC) meetings (all supervisors with personnel in the TQP are members of the council) and through e-mails from the FTCP Agent. The NNSA Service Center is just starting a tracking tool to track progress of all NNSA TQP participants. Progress of SSO personnel to meeting their SSO qualification requirements are just being added to these tools. Interviews indicated some supervisors discuss progress with individual employees on a regular basis.

Interviews conducted generally indicated roles and responsibilities of SSO personnel and their supervisors were well understood. Interviewees expressed some differences on what were the responsibilities of SSO personnel for follow-up on deficiencies they noted. The SSO Program Plan needs to clarify the expectation of who will follow-up on deficiencies to ensure they are corrected.

Oversight Performance (OP)

The CRADS used for this functional area addressed actions taken to oversee the Contractor's cognizant system engineer program and to ensure SSO personnel are knowledgeable and familiar with assigned safety systems. Interviews were performed to confirm program understanding, ownership and implementation by personnel assigned SSO responsibilities.

The Lawrence Livermore National Laboratory (LLNL) Systems Engineer Program is in its infancy. LSO oversight of the LLNL program has determined that it is not yet adequately formalized. DOE 420.1A was added to the LLNL contract in August, 2004. LLNL has been requested to submit a resource loaded implementation plan for the systems engineering requirements of DOE 420.1A by February 2005. LSO oversight of the LLNL program has been limited to identifying those actions needed to bring LLNL in compliance with the DOE Order.

LSO is just beginning to implement the SSO Program Plan. The SSO Program Manager has met with all SSO personnel to review the Program Plan and discuss their roles and responsibilities. SSO personnel have started to meet with the LLNL systems engineers for their assigned systems. Some SSO personnel have been performing oversight of their assigned systems as part of the Functional Area Manager duties, e.g. the SSO person for the Criticality Alarm System is also the Functional Area Manager for criticality safety.

An interview with a Facility Representative indicated that interactions between Facility Representatives and SSO personnel are beginning to occur. At this point of the implementation of the SSO program, there are no routine meetings between SSO personnel and Facility Representatives.

Expectations regarding the level of oversight are not yet well defined. The SSO Program Plan requires SSO personnel to perform periodic assessments, but no further definition of the frequency of these assessments (or other oversight functions) is given. LSO uses

Operational Awareness Plans to define the expectations of the level of oversight to be performed by staff. However, these plans do not specifically define SSO activities.

CONCLUSIONS and RECOMMENDATIONS

The SSO Program Plan describes a process to implement the SSO function which meets the requirements of DOE M 426.1-1A. LSO is just beginning the implementation of the Program Plan. Currently implementation has not progressed far enough to determine if the LSO SSO program will meet the two Objectives in the Oversight Performance CRADs. The LSO SSO program does meet the objectives of the Program, Training and Qualification, and Management CRADs. Several Opportunities for Improvement listed below were identified during the review:

- Program Plan should be revised to address the following comments:
 - Define the system for maintaining configuration on the vital safety systems list.
 - Clarifying responsibilities for follow-up on deficiencies identified by SSO personnel.
 - Add more specificity regarding the level of oversight to be performed.
- Modify SSO personnel performance plans to specifically include their SSO duties.
- Modify Operational Awareness Plans, or other documents to specify SSO oversight activities.

ATTACHMENT: Safety System Oversight (SSO) Program Implementation Assessment Criteria Review and Approach Documents (CRADs)

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Attachment A

**Criteria and Review Approach Documents
(CRADs)**

Safety System Oversight (SSO) Program Implementation Assessment Criteria and Review Approach Documents (CRADs)

Revision 0

PROGRAM (PGM)

OBJECTIVE

PGM.1 An effective SSO Program is established by the Field Element Manager to apply engineering expertise to maintain safety system configuration and to assess system condition and effectiveness of safety management program implementation.

Criteria

- PGM.1.1 The SSO Qualification Program is part of the Technical Qualification Program (DOE M 426.1-1A, Chapter III, Section 1, 2.b (1)).
- PGM.1.2 The SSO Program establishes appropriate training, qualification, and performance requirements for SSO personnel and the supervisors are held accountable for achieving them (DOE M 426.1-1A, Chapter III, Section 1, 2.b (2)).
- PGM.1.3 The safety systems and safety management programs included in the SSO Program align with those systems and programs identified in the applicable Documented Safety Analysis (DOE M 426.1-1A, Chapter III, Section 1, 4.c).
- PGM.1.4 Safety system oversight requirements are defined and implemented, for example, functions, responsibilities, and authorities of personnel assigned to perform safety system oversight and their interface/support of Facility Representatives are clearly defined, and SSO staffing needs are identified and there is a plan or process to ensure future staffing needs are met and maintained (DOE M 426.1-1A, Chapter III, Section 1, 2.b (3) & (4)).
- PGM.1.5 Affected DOE and contractor managers understand the SSO role and relationship to Facility Representatives and the contractor's cognizant System Engineers, and provide the necessary access and support (DOE M 426.1-1A, Chapter III, Section 1, 3.d).
- PGM.1.6 Qualifying Officials are assigned to sign site-specific Qualification Cards (DOE M 426.1-1A, Chapter III, Section 1, 2.b (6)).
- PGM.1.7 The SSO Program contains features to verify that SSO candidates possess the required level of knowledge and/or skills to perform assessments and investigations to confirm performance of safety systems in meeting

established safety and mission requirements (DOE M 426.1-1A, Chapter III, Section 1, 2.b (5)).

Approach

Record Review: Review documentation (e.g., site technical qualification program documents, SSO Program Plan, SSO Program procedures, qualification cards and/or standards, internal memorandums, Documented Safety Analyses, etc.) which establish the SSO Program and describe its implementation to determine that the program is complete and comprehensive.

Interviews: Interview management personnel with responsibilities for implementing and executing the SSO program to determine if they are familiar with the role of SSO personnel relative to the Facility Representatives and the contractor's cognizant system engineers, if they provide adequate resources for training, qualification, future staffing, and performance of SSO personnel, and if they appropriately qualified to perform their assigned role in the SSO program. Interview qualifying officials to determine if they are familiar with their role and responsibility, they are currently qualified, and they are performing their assigned role.

Field Observation: Evaluate any process used by or directed by the Field Element Manager to determine the effectiveness of SSO Program Performance.

TRAINING AND QUALIFICATION (TQ)

OBJECTIVE

TQ.1 SSO personnel and supervisors with responsibilities for SSO personnel are appropriately trained and qualified, or are in the process of achieving qualification.

Criteria

- TQ.1.1 Supervisors with responsibilities for SSO personnel maintain Senior Technical Safety Manager (STSM) qualification (DOE M 426.1-1A, Chapter III, Section 1, 2.c (1)).
- TQ.1.2 Site-specific qualification standards and cards have been developed and a documented process is implemented to assure that SSO candidates meet, at a minimum, the SSO knowledge, skills, and abilities specified in the *Federal Technical Capability Manual* DDOE 426.1-1A, Chapter III, Section 1, 5.a & 5.b)
- TQ.1.3 All SSO personnel have completed or are completing the General Technical Base Qualification Standard (DOE-STD-1146-2001) and one or more Functional Area Qualification Standard(s) in a technical area linked to their individual job descriptions (DOE M 426.1-1A, Chapter III, Section 1, 4.a).
- TQ.1.4 All SSO personnel have completed or are completing the site-specific qualification standard associated with assigned safety systems (DOE M 426.1-1A, Chapter III, Section 1, 4.a).
- TQ.1.5 SSO Supervisors have established methods to assign initial qualification dates, track progress toward qualification, and ensure retraining/requalification occurs as required for each SSO candidate in the qualification process (DOE M 426.1-1A, Chapter III, Section 1, 2.c (4) through (6)).

Approach

Record Review: Review qualification records to establish that supervisors and managers of SSO are qualified as an STSM and that SSO personnel are trained and qualified. Review qualification and requalification schedules, staffing plans, training plans, travel funding, etc. to determine that sufficient resources are provided for training, retraining, qualifying, and requalifying SSO personnel.

Interviews: Interview supervisors, training coordinators, SSO personnel, and budget personnel to establish that training and qualification plans and schedules are being executed as planned and that sufficient resources are provided to meet the schedules.

Field Observation: Observe activities associated with the qualification process, such as qualification boards, exams, walk throughs to determine that the training and qualification process is implemented and functioning effectively.

MANAGEMENT (MG)

OBJECTIVE

MG.1 SSO Supervisors effectively perform their SSO program responsibilities.

Criteria

- MG.1.1 Site-specific SSO qualification standards and cards are developed (DOE M 426.1-1A, Chapter III, Section 1, 2.c (2)).
- MG.1.2 Supervisors have identified and approved SSO candidate selection (DOE M 426.1-1A, Chapter III, Section 1, 2.c (3)).
- MG.1.3 Supervisors of SSO personnel have established SSO personnel qualification schedules and are tracking progress (DOE M 426.1-1A, Chapter III, Section 1, 2.c (4)).
- MG.1.4 Supervisors facilitate SSO qualification (e.g., ensure sufficient time and training are provided to complete qualification tasks) (DOE M 426.1-1A, Chapter III, Section 1, 2.c (5)).
- MG.1.5 Supervisors ensure SSO personnel are trained and qualified to perform assigned duties (DOE M 426.1-1A, Chapter III, Section 1, 2.c (6)).
- MG.1.6 SSO responsibilities are included and measured in Individual Performance Plans (DOE M 426.1-1A, Chapter III, Section 1, 2.c (7)).
- MG.1.7 Ensure SSO qualifications are maintained current by training and assignments planned in Individual Development Plans (DOE M 426.1-1A, Chapter III, Section 1, 2.c (8)).
- MG.1.8 SSO Supervisors periodically evaluate program effectiveness and implement corrective actions in a timely manner (DOE M 426.1-1A, Chapter III, Section 1, 2.c (9)).

Approach

Record Review: Review qualification cards, Individual Performance Plans, and other SSO program documents and procedures to establish that managers and supervisors are effectively performing their responsibilities as defined in the SSO program. Review other documentation used by supervisors to establish SSO program effectiveness and implementation of corrective actions.

Interviews: Interview supervisors and managers to establish that they are familiar with their assigned roles, they perform their assigned duties, monitor the effectiveness of the SSO program and ensure any identified corrective actions are implemented.

Field Observation: Observe any activities associated with SSO program effectiveness evaluations and/or corrective action implementation.

OVERSIGHT PERFORMANCE (OP)

OBJECTIVE

OP.1 Collectively, SSO personnel provide oversight of the Contractors' System Engineer Program.

Criteria

- OP.1.1 Oversight performed by SSO personnel establishes that the contractor System Engineer Program is effectively implemented with goals, objectives, and performance measures (DOE M 426.1-1A, Chapter III, Section 1, 2.a (1)).
- OP.1.2 SSO personnel maintain communication with the contractor's cognizant System Engineer (DOE M 426.1-1A, Chapter III, Section 1, 2.a (1)).
- OP.1.3 SSO personnel monitor performance of the contractor's cognizant System Engineer Program (DOE M 426.1-1A, Chapter III, Section 1, 2.a (1)).
- OP.1.4 SSO personnel attend selected contractor meetings with Facility Representatives and contractor personnel responsible for system performance (e.g., cognizant System Engineers, design authorities, and program managers) (DOE M 426.1-1A, Chapter III, Section 1, 2.a (3)).

Approach

Record Review: Review oversight documentation, such as SSO assessment reports, SSO walk throughs, correspondence, SSO activity records or logs, corrective action documents, etc. to establish that SSO personnel are overseeing implementation and execution of the contractor system engineer program. Review the contractor's system engineer program to determine whether there are any program weaknesses or deficiencies that have not been identified by SSO personnel.

Interviews: Interview SSO personnel, Facility Representatives, and contractor system engineers to establish the level of interface between SSO personnel and the contractor's cognizant system engineers.

Field Observation: Observe any oversight activities of the contractor's system engineer program performed by SSO personnel.

OBJECTIVE

OP.2 SSO personnel are knowledgeable and familiar with assigned safety systems and/or programs.

Criteria

- OP.2.1 A qualified SSO is, in fact, knowledgeable of the system status, performance, maintenance, operations, design, and vulnerabilities of their assigned systems or programs. This is evidenced by:
 - OP.2.1.1 SSO personnel regularly and routinely review periodic system health/status reports (DOE M 426.1-1A, Chapter III, Section 1, 2.a (2)).
 - OP.2.1.2 SSO personnel review test results, investigation reports, root cause analyses, etc (DOE M 426.1-1A, Chapter III, Section 1, 2.a (2)).
 - OP.2.1.3 SSO personnel interface with external organizations that can provide insights on performance (DOE M 426.1-1A, Chapter III, Section 1, 2.a (2)).
 - OP.2.1.4 SSO personnel perform assessments, periodic evaluations of equipment configuration and material condition and safety management program implementation (DOE M 426.1-1A, Chapter III, Section 1, 2.a (3)).
 - OP.2.1.5 SSO personnel evaluate the effects of aging on system equipment and components, the adequacy of work control and change control processes, and consider the appropriateness of system maintenance and surveillance activities with respect to reliable performance of safety function(s) (DOE M 426.1-1A, Chapter III, Section 1, 2.a (3)).
 - OP.2.1.6 SSO personnel identify technical issues and participate actively in the resolution of the issues.
- OP.2.2 Safety systems and safety management programs have established goals, objectives, and performance measures
- OP.2.3 SSO personnel perform evaluations of contractor troubleshooting, investigations, root cause evaluations, and selection and implementation of corrective actions, in conjunction with Facility Representatives (DOE M 426.1-1A, Chapter III, Section 1, 2.a (4)).
- OP.2.4 SSO personnel provide support to other Federal employees, as appropriate. (DOE M 426.1-1A, Chapter III, Section 1, 2.a (5))
- OP.2.5 SSO personnel assess contractor compliance with relevant DOE regulations, industry standards, contract requirements, safety basis requirements, and other system requirements (DOE M 426.1-1A, Chapter III, Section 1, 2.a (6)).

- OP.2.6 SSO personnel confirm configuration documentation, procedures, and other sources of controlling information are current and accurate (DOE M 426.1-1A, Chapter III, Section 1, 2.a (7)).
- OP.2.7 SSO personnel report potential or emergent hazards immediately to DOE line management and Facility Representatives (DOE M 426.1-1A, Chapter III, Section 1, 2.a (8)).
- OP.2.8 SSO personnel stop tasks, if required, to prevent imminent impact to the health and safety of workers and the public, to protect the environment, or to protect the facility and equipment and immediately notify the on-duty or on-call Facility Representative (DOE M 426.1-1A, Chapter III, Section 1, 2.a (8)).
- OP.2.9 SSO personnel serve, when assigned, as qualifying officials in the development or revision of Functional Area Qualification Standards, mentor assigned backups, and qualify other candidates to the Functional Area Qualifications Standards needed to achieve Safety System oversight qualification (DOE M 426.1-1A, Chapter III, Section 1, 2.a (9)).
- OP.2.10 SSO personnel maintain cognizance of the appropriate funding and resources to maintain and improve safety systems (DOE M 426.1-1A, Chapter III, Section 1, 2.a (10)).
- OP.2.11 Methods have been established for SSO personnel to routinely communicate system/program performance information and issues with STSMs and the Field Office Manager (DOE M 426.1-1A, Chapter III, Section 1, 2.a (1)).

Approach

Record Review: Review oversight documentation, such as SSO assessment reports, SSO walk throughs, correspondence, SSO activity records or logs, corrective action documents, etc. to establish that SSO personnel are performing required oversight. Review contract requirements and their flow down through the contract to the safety systems and safety management programs to establish the effectiveness of SSO personnel oversight that the contractor complies with all requirements relative to safety systems and programs. Review a sample of the safety system health reports, safety system test reports, safety system investigation reports, safety system root cause analyses, etc. to determine the effectiveness of SSO personnel knowledge and familiarity with this information.

Interviews: Interview SSO personnel to determine their knowledge of and familiarity with assigned safety systems and safety management programs, and the reports that the contractor may generate in relation to the systems and programs.

Field Observation: Observe SSO personnel walk downs and other activities in the field to establish the level of SSO personnel knowledge and familiarity of safety systems.