Department of Energy
Washington, DC 20585

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MEMORANDUM FOR DISTRIBUTION

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KAREN L. BOARDMAN
CHAIRMAN
FEDERAL TECHNICAL CAPABILITY PANEL

SUBJECT: Safety System Oversight Program Improvement Report – 08-NA-SC-008

The purpose of this memorandum is to transmit the subject report developed by the Safety System Oversight (SSO) Program Improvement Working Group.

This Working Group was established and led by the Office of Health, Safety and Security's (HSS) Office of Nuclear Safety Policy and Assistance and the Federal Technical Capability Panel (FTCP). Representatives from the Chief of Nuclear Safety, the Chief of Defense Nuclear Safety, and several field organizations served on the Working Group. The Working Group collected information about how the Department of Energy (DOE) sites implement their SSO programs via a questionnaire, telephone interviews, and document reviews. In addition to data collection and analysis, HSS and FTCP sponsored a face-to-face meeting for SSO staff and managers in conjunction with the annual Facility Representative Workshop to further develop recommendations and define a path forward in May 2008. The Working Group's analysis, conclusions, and recommendations are presented in the attached report.

The Working Group's efforts were greatly facilitated by the cooperation and assistance of DOE line management and staff at many sites. Their dedication and hard work in gathering data and taking time for discussions and meetings are gratefully appreciated. The initiatives and actions that are now taking shape will help improve the Department's SSO implementation in support of effective nuclear safety oversight.

Attachment

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Analysis of
Safety System Oversight Programs
at DOE Sites

DOE Review Team Report

July 2008

Executive Summary

A Working Group led by the Office of Health, Safety and Security (HSS) and the Federal Technical Capability Panel (FTCP) with representatives from the Chief of Nuclear Safety (CNS), the Chief of Defense Nuclear Safety (CDNS), and several field organizations performed an analysis of Safety System Oversight (SSO) programs at the Department of Energy (DOE) to look for program improvements.

An analysis plan was provided to the Department of Energy (DOE) site managers in October 2007 to guide this effort. The Working Group collected data from November 2007 to March 2008 on SSO functions and responsibilities, staffing levels, and the methods utilized to perform the SSO functions and responsibilities. The Working Group met with SSO supervisors and staff from across the DOE complex during the SSO annual workshop in May 2008 to discuss the draft report and, in particular, its conclusions and recommendations.

The Working Group concluded that SSO programs are vital to DOE's oversight of contractors' safety performance and for assuring the safety of DOE nuclear facilities. Site SSO programs are focused on ensuring that the contractor's system engineers are in place and functioning to maintain nuclear facility safety systems capable of preventing and/or mitigating potential accidents. Almost all of the site SSO programs were very mature; however, maintaining adequate staffing was a challenge for many sites. The Working Group found that there were variations in methods for implementing SSO programs, most importantly in the use of a facility-based or system-based approach. The program leaders provided valid reasons for the variations, but further analysis and better documentation of the rationale for the approaches were deemed to be appropriate as the SSO community developed additional program guidance. It was clear from this analysis that the SSO function has to be well integrated with other oversight personnel, such as the Facility Representatives, safety basis reviewers, and subject matter experts to operate effectively.

The Working Group determined that that SSO programs could be improved complex-wide through clearer program requirements in DOE directives, better support for coordination and sharing of best practices among DOE sites, and better tools for program leaders to develop staffing and qualification plans. The recommendations identified in this report do not call for a major restructuring of the SSO program but rather some incremental improvements that will support all SSO programs. HSS and the FTCP plan on working with the CDNS, CNS and DOE line management to implement the program improvements listed below. The first step will be to establish an SSO program committee/working group to support implementation of these recommendations. The lead organization for implementing each of the recommendations is identified below:

1. HSS: Establish an SSO program committee/working group to increase sharing of best practices and develop products to support SSO programs.

2. HSS: Revise DOE Order 420.1B, *Facility Safety,* to include requirements for DOE SSO programs.

3. HSS: Coordinate development of a DOE Technical Standard that defines the SSO program similar to the Standard that defines the facility representative program and provides guidance for implementing an effective program.

4. FTCP: Develop a formal SSO Functional Area Qualification Standard.

5. FTCP: Provide additional SSO staffing guidance to identify the number of SSO personnel needed at DOE sites, particularly in light of the various methods used for implementing this responsibility.

6. HSS: Enhance SSO programs by developing review criteria for more detailed evaluations of the safety system design.

Analysis of
Safety System Oversight Programs at DOE Sites

1.0 INTRODUCTION

A Working Group led by the Office of Health, Safety and Security's (HSS) Office of Nuclear Safety Policy and Assistance and the Federal Technical Capability Panel (FTCP), with representatives from the Chief of Nuclear Safety (CNS), the Chief of Defense Nuclear Safety (CDNS), and several field organizations performed an analysis of Safety System Oversight (SSO) programs at the Department of Energy (DOE) to look for program improvements. This analysis was not a review of individual site compliance with SSO requirements in DOE M 426.1-1A, *Federal Technical Capability Manual* (FTCP Manual), but rather an analysis of site practices to understand the rationale for them and determine how some practices may benefit other site SSO programs.

This report provides the results of the SSO program analysis and recommendations for program improvements.

2.0 BACKGROUND

As part of the Department's Implementation Plan for Defense Nuclear Facilities Safety Board Recommendation 2000-2, *Configuration Management, Vital Safety Systems,* DOE required the creation of contractor System Engineers to help ensure operability of safety systems in DOE facilities. The Implementation Plan also called for the FTCP to identify the system expertise necessary for DOE oversight of safety systems; assess the availability of DOE staff to provide this oversight; and develop any needed Technical Qualification Program changes based on their assessment. In May 2004 the FTCP published the SSO program elements in the FTCP Manual. The SSO program's function is to provide DOE staff technical expertise on safety systems and to provide oversight of the contractor's design, configuration control, maintenance, and operation of safety systems. The FTCP also developed other documents to guide development of SSO programs, including a staffing analysis process, a generic SSO Qualification Standard, and an SSO Program Evaluation Criteria, Review and Approach Document (CRAD).

The FTCP conducted SSO program assessments in late 2005 into 2006 which, in general, characterized site SSO programs as being adequately implemented or in the process of implementation. The results of the assessments are included on the FTCP web site (http://www.hss.energy.gov/deprep/ftcp). In March 2006, the Office of Independent Oversight published the *Independent Oversight Report on Safety System Engineer and Oversight Programs,* which documented its review of SSO programs. The report recommended several actions to improve the SSO program, which are discussed below. The full report can be found at http://reportsip.hss.doe.gov/eshevals/2006/2006_SSO_Report.html.

Motivations for performing the current assessment included recognition that the SSO function was being implemented in a variety of ways, differences in staffing levels that raised questions about the effectiveness of the staffing analysis tool, concerns that having the program definition solely in the FTCP Manual may not be sufficient to support a continuing and robust SSO

program, and concerns that communication among DOE sites regarding best practices and lessons learned was not robust (in particular as compared to the Facility Representative program). Furthermore, some institutional-level recommendations for program improvements identified by Independent Oversight were not being pursued. This analysis was an opportunity to evaluate these recommendations and the responses thereto.

3.0 ASSESSMENT METHODOLOGY

In August 2007, the Working Group developed and issued a Project Plan with Lines of Inquiry for data collection to analyze SSO programs. Eleven DOE sites provided data per the Lines of Inquiry. The Working Group conducted teleconferences with many of the sites to refine and clarify the data and pursue follow-up questions. The Working Group met with SSO supervisors and staff from across the DOE complex during the SSO annual workshop in May 2008 to discuss the draft report and, in particular, the conclusions and recommendations.

Appendix A includes the Lines of Inquiry and team membership. Appendix B contains tabulated data from the site responses to the Lines of Inquiry and discussions between the team and site representatives.

4.0 RESULTS

Results from this analysis are as follows:

4.1 Program Implementation

The program implementation analysis includes a review of the organizational placement and management chain for SSO staff; how staff coverage of systems is allocated; SSO duties and authorities; the SSO staff interaction with/relationship to contractor organizations; and program documentation.

Organizational Schemes: Only one site has dedicated full-time SSO staff. All other sites have staff assigned SSO duties in addition to other duties. Those sites estimate that SSO duties occupy 10 percent to 80 percent of the available time for the matrixed SSO staff. Most sites organize the SSO staff under an Assistant Manager who is responsible for engineering, operations, or safety. A few sites have SSO staff under a line or program manager. A few sites use an SSO program manager from outside the management chain of the individual(s) performing SSO work, but most SSO program managers also serve as such individuals' supervisors.

Allocation of Systems to Staff: Two general schemes are used. Some sites assign systems for SSO coverage based on the engineering discipline across the whole site. For example, in this arrangement, a Mechanical Systems SSO staff member would cover all mechanical systems in all facilities, or an Instrumentation and Control (I&C) SSO staff member would cover I&C systems site-wide. Other sites assign SSO staff to cover facilities. These SSO personnel cover all safety systems at a facility, regardless of type. A few sites use both approaches, assigning SSO staff to facilities but covering specialized disciplines like fire protection or criticality safety in all facilities with site-wide SSO staff. The facility-centric method is particularly favored at

large sites where facilities are physically dispersed since it minimizes time lost traveling among widely dispersed facilities.

Duties, Authorities, and Contractor Relationships: SSO duties are typically identified in site procedures and are consistent with those set out in the FTCP Manual. A few sites assign SSO staff specific authorities based on the SSO function beyond safety-related "stop work" authority assigned to all Federal personnel. SSO influence on contractor actions is generally exercised through the Contracting Officer's Representative (COR). Contractor electronic document systems are usually available to SSO staff, but only a few sites specifically route documents to SSO staff for review or approval. SSO staff and Contractor Cognizant System Engineers interact frequently, including regularly scheduled meetings, day-to-day unscheduled discussions, and participation on review teams. SSO staff also have frequent interactions with contractor line managers, operators, and support organizations like Quality Assurance or Engineering.

Documentation: All sites have developed local directives for their SSO program. Some also have SSO program duties in individuals' Position Descriptions and Performance Plans.

4.2 Integration with Other Oversight Programs

SSO staff typically work closely with Facility Representatives (FRs), with all participating in regular meetings or calls and sharing issue follow-up and resolution. Some sites have the SSO staff and FRs in the same organization.

SSO staff support safety basis reviews as system experts, and at a few sites the SSO staff are also the safety basis review and approval staff. SSO personnel generally support oversight assessments and reviews beyond their specific systems and consult with other Federal staff for assistance with their systems. Sites rarely use outside safety system oversight assistance from service centers or Headquarters, and when they do it is for specific disciplines like seismic design for which they lack expertise.

Nearly all sites use a master assessment schedule to coordinate oversight efforts by all responsible groups.

One difference among SSO programs is the extent that (and when) SSO personnel get involved in major projects during the design and construction phase. Some sites wait until systems are ready for being turned over from the contractor before assigning SSO personnel to the system, while others assign SSO personnel during the development of safety system designs and facility safety basis.

4.3 Staffing Levels and Qualification

Only three of eleven sites report that they have enough SSO staff now. One site is still evaluating its staffing, and the other seven report current staff shortages and site staffing constraints that make hiring difficult. Specific staffing issues cited include: a surge in commercial nuclear staff hiring that attracts qualified DOE staff and makes their replacement more difficult; inability to replace departing staff due to hiring constraints; staff ceilings that

hinder succession planning; and new facilities at some sites that have additional safety systems that need to be assigned as extra duties to existing SSO personnel.

All sites report that they have developed local qualification standards to supplement FTCP-issued standards. Some use the FTCP-developed draft SSO qualification standard directly, but most have site-specific standards. Most sites would prefer that any SSO-specific final qualification standard cover oversight-specific topics and supplement, not replace any functional area standards.

4.4 SSO Program Leadership Opinions on Specific Questions

The Working Group's Lines of Inquiry (included in Appendix A) included some specific requests for SSO program leaders' opinions on topics, including whether their program would benefit from having a Standard similar to the FR Standard (DOE-STD 1063); improvement items for the FTCP Manual regarding the SSO program; ideas for better Headquarters support of SSO programs; and the utility of the SSO Staffing Analysis Tool.

During the data gathering teleconferences only two SSO program leaders stated a desire for developing an SSO Standard similar to the FR Standard. Most program leaders felt that their programs were adequately defined and implemented based upon the SSO program requirements contained in the FTCP Manual. However, during the May 2008 SSO workshop, the majority of the program leaders and participants developed a different opinion based upon a recognition that the current programs had expanded beyond that outlined in the FTCP Manual and that some activities called for in the FTCP Manual did not reflect their current program priorities. In addition, the program leaders and participants recognized that an SSO Standard would be useful for documenting recommended best practices and other guidance for implementing SSO programs.

Five SSO program leaders recommended changes to the FTCP Manual to improve the SSO Program definition, mostly concerning clearer definition of SSO responsibilities. Furthermore, eight program leaders provided recommendations for how Headquarters could help their SSO programs, mostly concerning clarifying expectations, providing an SSO Champion, providing better technical support and access to consensus standards, and fostering lessons learned and best practices sharing. Finally, some leaders recommended improvement of the FTCP staffing analysis tool for SSO staff, primarily because it was not providing reasonable results for the number of staff needed given site-specific conditions

4.5 Review of Independent Oversight Recommendations

A review of the current applicability and merit of the March 2006 Office of Independent Oversight recommendations is discussed below.

Incorporate SSO responsibilities into the DOE Oversight Manual. Independent Oversight recommended incorporating SSO responsibilities into the DOE Oversight Manual and providing additional guidance on SSO duties. The rationale for this argument was twofold:

- Including oversight requirements in the FTCP Manual was not optimal. Rather, it would be better for SSO requirements to be included in a document (such as the proposed Oversight Manual) that comprehensively addresses oversight requirements (not just the SSO requirements). Then the technical capabilities needed to perform the oversight would be included in the FTCP Manual.

- Although the FTCP Manual requirements were appropriate for the start up of the SSO programs, they should be streamlined and refined based upon current/best practices.

Development of an Oversight Manual was suspended before the SSO program recommendations could be implemented so this is not longer a viable option. At the time of this review, DOE had been updating the FTCP Manual and was considering removing the detailed SSO requirements and including them in another document, such as a FTCP qualification standard for SSO personnel. However, transfer of the detailed requirements was determined not to be appropriate until both this review was completed and program improvements were identified and formally included in a requirements documents. The Working Group, with input from the SSO Annual Meeting in May 2008, concluded that it would be appropriate to revise DOE O 420.1B, *Facility Safety,* to include SSO program requirements, and develop a new Technical Standard for program details. Much of the technical work needed to develop this standard or guide has already been done as part of the current analysis effort and previous efforts to establish and review SSO programs.

Establish a formal, DOE-wide technical qualification standard. The rationale for this recommendation was that, consistent with other important technical oversight functions, a Functional Area Qualification Standard (FAQS) should be developed for SSO personnel. This 2008 review concluded that, while the existing draft FTCP SSO FAQS plus local site-specific standards and SSO Technical Qualifications Program (TQP) participant qualification on established FAQS has provided appropriately qualified SSO personnel, a dedicated SSO FAQS is still warranted.

Expand the scope of applicability of requirements for SSO programs to include non-defense hazard category 1, 2, and 3 nuclear facilities, including DOE's nuclear reactors. The Working Group did not address this recommendation because it was not within the scope of its effort (which was to look to program improvements for sites which had SSO programs). However, the results of this SSO program review will be shared with senior DOE program office managers with responsibility for non-defense nuclear facilities.

Continue to share SSO program lessons learned via annual meetings or other mechanisms. The team agreed that this was important and this report is, in part, a response to this recommendation. Furthermore, annual SSO program meetings are being continued and actions have been taken to improve sharing of lessons-learned via the SSO web page.

Enhance the safety system assessments by establishing review criteria for the design and operations areas. This recommendation was focused on the contractor system engineer review of safety systems. Related recommendations concerning reviews of design documents were provided in the Independent Assessment report on Safety System Functionality issued in January 2006. The Working Group believes that review of engineering design documents (including

calculations and assumptions) as part of periodic system assessment by both the contractor system engineer and SSO personnel will be an important enhancement to the SSO. However, these can be resource-intensive and must be appropriately integrated/balanced with other SSO duties and activities.

5. SUMMARY/CONCLUSIONS

The Working Group concluded that SSO programs are vital to DOE's oversight of contractors' safety performance and for assuring the safety of DOE nuclear facilities. Site SSO programs are focused on ensuring that the contractors system engineers are in place and functioning to maintain nuclear facility safety systems capable of preventing and/or mitigating potential accidents. Almost all of the site SSO programs were very mature; however, maintaining adequate staffing was a challenge for many sites. The Working Group found that there were variations in methods for implementing SSO programs, most importantly in the use of a facility-based or system-based approach. The program leaders provided valid reasons for the variations, but further analysis and better documentation of the rationale for the approaches were deemed to be appropriate as the SSO community developed additional program guidance. It was clear from this analysis that the SSO function has to be well integrated with other oversight personnel; such as FRs, safety basis reviewers, and subject matter experts to operate effectively.

6. RECOMMENDATIONS

Annually, SSO personnel from across the DOE complex and supporting site office and Headquarters personnel should meet to discuss best practices in overseeing contractor system engineer programs and evaluating safety systems. A focus of the 2008 workshop (held in May) was the review of a draft of this SSO analysis and, in particular, its recommendations.

Based upon this SSO program analysis and feedback from the 2008 workshop, the Working Group concluded that SSO programs could be improved complex-wide through clearer program requirements in DOE directives, better support for coordination and sharing of best practices among DOE sites, and better tools for program leaders to develop staffing and qualification plans. The recommendations identified do not call for a major restructuring of the SSO program but rather some incremental improvements that will support all SSO programs. HSS and the FTCP plan on working the CDNS, CNS, and DOE line management to implement the program improvements listed below. The first step will be to establish an SSO program committee/working group to support implementation of these recommendations. The lead organization for implementing each of the recommendations is included in the list below.

1. HSS: Establish an SSO program committee/working group to increase sharing of best practices and develop products to support SSO programs.

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4. FTCP: Develop a formal SSO Functional Area Qualification Standard.

5. FTCP: Provide additional SSO staffing guidance to identify the number of SSO personnel needed at DOE sites, particularly in light of the various methods used for implementing this responsibility.

6. HSS: Enhance SSO programs by developing review criteria for more detailed evaluations of the safety system design.

APPENDIX A

Safety System Oversight (SSO) Federal Personnel Data Collection Lines of Inquiry and Team Members

Documents to Support Evaluation

- Organization Chart
- SSO procedure (and supporting procedures if any)
- List of SSO personnel, their area(s) of expertise, and systems they are responsible for
- Latest SSO staffing analysis
- List of reviews performed by SSOs over the last two years

General Organization

1. Do the SSO personnel report to a single manager/supervisor?

2. Where is the Federal manager responsible for SSO program located in the local Office organization?

3. How are safety systems assigned to SSO personnel? (By facility, by similar systems at multiple facilities, by engineering discipline, etc.)

Relationship

1. What is the relationship between federal safety system oversight program/staff and the Facility Representatives (FR)? (Shared duties, consultation (SSO to FR or FR to SSO,, etc.)

2. What is the relationship between federal SSO staff and federal staff with responsibility for safety basis review/oversight staff, Quality Assurance (QA), etc.?

3. What other Office organizations or programs interface with safety system oversight?

4. Do SSO personnel utilize Program Secretarial Officer or Service Center support for any engineering disciplines or safety specialties or issues (what are the issues)?

Staffing

1. What is the total number of Full Time Equivalents devoted to the SSO program? How many staff members are assigned SSO duties (full or part time)?

2. What percentage of the time do SSO personnel perform SSO tasks (as defined in the FTCP Manual)?

3. Is the staffing analysis a good tool for determining staff needs?

4. How do the site SSO, FR and Subject Matter Expert (SME) programs coordinate their efforts?

5. Do site managers feel there are sufficient SSO resources when balanced against FR and SME needs? If not, what resource constraints do they face?

Training and Qualification

1. Describe the site's training and qualification program.

2. What qualification standard is utilized for the SSO program (e.g., locally generated qualification card)? Would an SSO Functional Area Qualification Standard provide more structure/consistency for SSO Technical Qualification Program portability between sites?

3. What current training is provided to SSO personnel (DOE National Training Center SSO courses, etc.) and what additional training would benefit them?

Duties and Responsibilities

1. Where are SSO duties spelled out?

2. What authorities do safety system oversight personnel exercise? (Approve contractor actions? Approve procurement? Accept maintenance or startup review results? Others?) Are these authorities formally designated?

3. Is there a formal schedule of SSO activities?

4. What are the number and type of systems walkdowns conducted?

5. What are the number and type of Cognizant System Engineer program evaluations conducted?

6. What are the number and type of configuration management evaluations conducted?

7. Do SSO personnel participate in new projects? (An example would be reviewing contractor work for the Critical Decision points during the design phase.) If so, how much of their work involves new vice existing facilities?

8. How do Federal SSO personnel interact with Contractor Safety System Engineers or their equivalent?

9. What Contractor organizations or programs interface with federal safety system oversight? (Contractor safety system engineers, maintenance, QA, configuration management, etc.) Are any contractor documents (e.g., procurement specifications, designs for review, operations or maintenance procedures, assessment reports) routinely sent to or through SSO personnel?

Program Changes

1. Since the SSO program was established, what are some of the more significant changes the site has made and why?

2. Do site managers have any recommended changes to the FTCP Manual SSO duties and responsibilities? If yes, what are they?

3. Do site managers recommend a stand-alone standard [program, not qualification] be developed for SSO personnel (similar to that for FRs)?

4. How do DOE site managers think Headquarters organizations (e.g., HSS, PSO, and Chief of Nuclear/Defense Nuclear Safety) could better support the site SSO program?

General

1. What is the level of maturity and effectiveness of the Contractor System Engineer program?

2. What is the level of maturity and effectiveness of the contractor configuration management program?

3. What is the level of maturity and effectiveness of the contractor QA program?

4. Does the contractor's performance in System Engineering, Configuration Management, and Quality Assurance require more Safety System Oversight attention than site resources can support?

Safety System Oversight Evaluation Team Members

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APPENDIX B

Tabulated data from Field responses to the Lines of Inquiry (LOI) and teleconferences

The columns are keyed to LOI questions. Field input in the rows was paraphrased and condensed to allow tabular presentation. The LOI's "General" section responses were subjective evaluations of contractor performance, not final DOE judgments, and are not included.

Table 1 Safety System Oversight data summary, Lines of Inquiry items: Organization, Relations, Staffing, and Training/Qualification. (Two pages)

Site	Organization 1&2 **SSO Mgr**	3 **How assigned**	Relations 1 **SSO-FR relation**	2 **SSO-DSA revw / QA staff relations**	3 **Other relations**	4 **Outside help**	Staffing 1 **SSO Staff/FTE**	2 **SSO time %**	3 **FTCP Staff analysis tool OK?**	4 **How do FR/SSO/SME coordinate?**	5 **Enough SSO? Constraints?**	Trng/Qual 1, 2, 3 **Site Qual Program**	2 **Want SSO FAQS?**
ORO	Report to three mgrs in two orgs; SSO resp/duties matrixed to one person; SSO mgr has 2 of the 4 SSOs as employees and is adding 1, for 3 of 5 SSOs in EM org.	Grouped systems: Fire Protection, Ventilation, I&C, CAAS.	FR- cover ops, SSO cover specific system health.	SSOs support DSA staff for items affecting their systems. SSOs support QA div assessments.	Fed Project Dirs, SMEs, Budget & Finance.	None. May use PSO SMEs for upcoming design reviews.	4 / 1.64 Analysis says need 2.11	41%	Yes	Assessment schedule; frequent communications; attend same meetings.	Not enough Staffing ceilings	Site cards; SSO is additional level with local card. Local training courses, some NTC courses.	No answer
SNL	AM Facility Ops	Facility (2 facilities, 6 SS systems)	SSOs, FRs, and Safety Basis staff are co-located and communicate daily. FRs consult with SSOs on specific issues.	SSOs support DSA staff. SSO have served on every SAR review team so far.	Frequently with the AM, ES&H, Safety Basis. Less active with Projects, Programs, QA.	Some informal support by NNSA SC and HQ.	2 /1.4 4 total staff in nuclear operations	80	No opinion- Has Not been done.	FR/SSO meetings weekly. Another weekly mtg for SSOs, FRs, and SMEs. Master Activity Plan for oversight looks.	Potential issues with succession planning and backup- will know more after staffing analysis.	SSOs do GTB, Functional area (mech and I&C) and site specific card.	Would benefit if it replaced FAQS for mechanical or I&C. Those FAQS seem redundant for staff with degrees in the area.
SRS	SSOs are Facility Engineers assigned to either AM Waste Disposition or AM Nuke Matl Stab.	By facility , except: One SSO for all criticality alarms and safety, and one SSO for passive structural SSCs.	FRs oversee ops and safety performance. SSOs oversee systems. SSOs assist FRs with system reviews and issue resolution.	SSOs are the Facility Engineers who review DSA documents and write SERs. QA and other SMEs matrixed.	None but FRs, SMEs, Line Mgt.	Some SQA help from the CNS office, some contract support for SERs.	No full-time SSOs. 22 staff positions include SSO duties, vacancies, and not-yet-qualified people.	30-40% in "normal" times. Currently <10% due to SER work and unfilled positions.	Annual letter's general methodology is good. 2004 specific calculation is not useful.	FRs and Facility Engineers (SSOs) work closely. SMEs support as needed.	Need additional staff. Retention and hiring difficult due to commercial nuclear work surge and FTE ceiling. Considering contracted support for certain work.	Facility Engineers complete GTB, technical area, site specific cards. Once qualified, complete local SSO card.	Not useful for systems, but would work for generic items like directives, assessment and root cause techniques, etc.
Y-12	AM Eng, Safety, and Environment	By discipline, but some SSOs cover systems outside their discipline.	Each "Vital Safety System" (VSS) has assigned FR, SO, and Safety Basis Eng assigned. Daily call among FRs and Lead SSO. FRs and SSOs hand off issues as necessary. SSOs cover startup operating procedures.	SSOs support safety basis reviews and startup oversight.	Fed Program and Project mgrs request SSO support using same system as for FRs. SSOs assigned by discipline.	Generally not for SSOs, but some specific disciplines support other engineering tasks (seismic, PRA, Criticality et al).	6.67 / 6	60-85	Yes, but could be improved.	No Response (LOI had two question #4s).	No. Also short FR and Project oversight staff.	NNSA-accredited TQP. Uses GTB and technical FAQS plus local SSO card. SSOs attend NTC SSO and Assessment courses; Attend YSO and some FR continuing training; Must get 80 hrs professi0nal development training each 3-year requal cycle.	Yes, provided it looks like Y-12 local version.
ID	ALL: oversight by NE SSO Program Mgr EM:SSOs for all facilities in independent org under the AM for Nuke Saf. & Perf NE: SSOs report to Facility Line Mgt.	All SSOs are also NSS responsible for safety basis docs. Systems assigned based on safety basis responsibility.	Systems all have assigned FRs, SSO/NSS, and sometimes an SME. FRs keep SSOs informed about issues and consult for questions. DSA review teams often include FRs or SMEs.	See ← QA staff may also serve on DSA reviews.	SSOs are part of a larger and more interlocked safety oversight scheme. Many Feds in many organizations help.	Support received from HSS and NE during design basis reconstitution and one in-depth vertical slice.	EM: 4.79 (from 2005 analysis) / 4 NE: 5.19 (2005) 4 staff and 1 hire in progress	10-20% ATR 50% (design basis reconstitution required 100% of one SSO)	Yes. Consider using CSE maturity or Authorization Basis life cycle to modify needs.	All 3 produce annual oversight plans and consult extensively to coordinate. Ad-hoc daily communication.	Overall, yes. Need one more for Materials and Fuels Complex, site is hiring.	Use GTB FAQS, technical FAQS if applicable, site SSO card and final walk-through of assessment and facility walkdown. Continuing training qtrly and 5-year requal, individual training as hoc.	Not needed
RL	AM Safety and Engineering (sme as for FACREPS and Safety Basis staff).	Functional areas (Elec, mech, crit, etc) 47 systems.	Shared duties, consultation among all.	All work together- in same shop.	Technical SMEs and all Projects	None	5 / 1.9	Varies	"Absolutely not"	Tight affiliation- same shop. SSOs are SMEs for their areas.	Generally sufficient	SSOs complete cards for GTB and technical area, plus local RL SSO and RL specific.	No. SSOs are already experts, so SSO qual is small increment.

Table 1 Safety System Oversight data summary, Lines of Inquiry items: Organization, Relations, Staffing, and Training/Qualification. (Two pages)

Site	Organization 1&2 **SSO Mgr**	3 **How assigned**	Relations 1 **SSO-FR relation**	2 **SSO-DSA revw / QA staff relations**	3 **Other relations**	4 **Outside help**	Staffing 1 **SSO Staff/FTE**	2 **SSO time %**	3 **FTCP Staff analysis tool OK?**	4 **How do FR/SSO/SME coordinate?**	5 **Enough SSO? Constraints?**	Trng/Qual 1, 2, 3 **Site Qual Program**	2 **Want SSO FAQS?**
ORP	Tank Farms and WTP SSOs report to their respective Dir, Engineering Divisions.	Tank Farms: By system WTP: By Discipline	Consultation and collaboration	Report to different orgs, but collaborate for issues and assessments.	Program Managers and Fed Project Directors	None	9 /11.3 4 vacancies	TF: 10-30 WTP: 20-30	No	Personal interactions and POD mtgs	TF: yes WTP: Reorganizing to align with contractor org	Local TQP directives with local qual cards for all SSO positions.	No. DOE-wide FAQS would not help much since ORP would still require local cards.
NSO	Nuke Saf. Team / Office of the Mgr	By System 14 systems, 3 new facilities coming	SSOs consult FRs	Working relationship for SME support; SSOs serve on revw teams; QA staffer part of SSO/Safety Basis Revw teams.	Management and Line Management	SMEs from NNSA-SC	4 staff / 1.5 FTE	30	Good but needs revision to apply to SSO vice FR	NSO developing master assessment schedule	No- Unqualified staff; SSO perceived stature below FR- no bonus for travel to remote site, SSO is collateral duty.	NTC SAF-271 and 272, local card. Would like more design requirements and Codes training.	Yes- would provide consistency across NNSA.
LASO	Mgr is only SSO staff. Assigned half-time to SSO, planned to go to 0.75 FTE.	Now: None Plan: by discipline 74 active sys	Informal FRs give heads-up to SSO	Limited ad-hoc	Saf. Auth. Basis staff, Projects, NNSA-SC, Maintenance, all ad-hoc.	Nearly all from NNSA-SC	1 staff / 0.5 FTE Planned 2.75 FTE	25 (half the time of the 0.5 FTE)	Good but needs better fit to specific systems. LASO added a 'complexity factor' to adjust levels.	Ad-hoc	No. LASO needs 6 FTE, hiring to get 2.75, while FTCP tool result is 12 FTE. Difficult to recruit and retain.	Developing local card. 76 LASO TQP billets managed by one Fed, no cont support.	Yes-would be useful for portability and basic requirements.
PXSO	AM for Nuclear Engineering	Engineering Discipline	SSOs, QA, and SMEs attend FR morning conference call. Issue follow-up goes to FRs or SSOs based on OPS/SYS nexus. SSOs and FRs consult each other.	SSOs, QA staff, and DSA staff consult each other. SSOs support DSA reviews.	SSOs work with Site Engineering Programs as review team members and design reviewers.	PXSO mostly self-sufficient. Some CDNS staff sometimes review design changes.	4 staff (one part time) / 4 FTE	50	Proved essential to support staff needs, system assignments, and reorganization. Adjusted to account for local conditions; some FR-derived sheets don't apply well to SSOs.	SSOs, SMEs, and FRs coordinate on a daily call and distribute reports to all.	Staffing tool indicates one more SSO FTE needed. Staff ceiling prevents hiring; Additional FTE might not go to SSO even if hired.	TQP FAQS for GTB + discipline, and local card with SSO-specific items. NTC SSO courses.	Yes- "greatly beneficial to supplement site specific standard."
LSO	AM- Ops (2 FTE/SSO) AM- Tech Svcs (0.05 FTE-Crit Safety) AM-Ops sets oversight rqmts for all.	Now: all to one qualified SSO Planned: Discipline + similar systems.	LSO Ops Teams, made of SSOs, SMEs, FRs and Program Mgrs for facility or group of facilities. SSOs and FRs report to AM Ops, while SMEs report to AM- Tech Svcs FRs consult with SSOs for system issues. Tasking in *Pegasus* system.	Same as ←	Same as ← plus SMEs for construction, fire prot, IH, Rad, etc.	Use NNSA SC for SMEs not on site Recent examples: Seismic, fire protection, confinement ventilation.	3 staff/ 2.05 FTE 1 qualified full time SSO, one in quals, 0.05 FTE for criticality safety.	100% for the 2 full time SSOs	"Sufficient" Most systems all within 200 yards of each other, others are similar and Defense in Depth systems.	Master assessment schedule for the FY; plus Ops Team and informal communications.	Yes. AM-Ops can balance resources among SSO and FR, and to a degree also with SME.	Site TQP uses GTB, Mech and Elec FAQS, site specific, and safety system specific cards. Have one each Mech and Elec SSOs. Crit Safety person uses that FAQS. Use NTC courses plus NFPA courses and vendor system-specific courses.	No. Uses the FTCP-generated FAQS plus draft SSO FAQS with only minor mods.

Table 2 Safety System Oversight data summary, Lines of Inquiry items: Duties and Responsibilities and Program Changes. (Two pages)

Site	Duties 1 **Directives**	2 **Authorities**	3 **SSO Oversight Schedule?**	4 **# / type of walkdowns**	5 **# / type CSE Prog Evals**	6 **# / type config mgt evals**	7 **SSO do new projects?**	8 **SSO / CSE interactions**	9 **SSO / Cont. org interfaces**	9 **SSO reviews of Cont docs?**	Prog. Changes 1 **Site changes since SSO inception**	2 **Site want FTCP Man changes?**	3 **Site want SSO Std like FR Std?**	4 **How can HQ help?**
ORO	Local directive and procedure	Stop Work No special authorities	Yes	Appears to be about quarterly.	11 in 2006, 6 on 2007 (assuming all get done)	None. Cover CM as part of CSE evals.	Yes-on teams	Frequent phone and e-mail comms, some meetings.	Safety System Engineers, facility mgrs;	New / Changed docs routed; SSOs have electronic access to main safety docs.	SC transferred 3019 to EM, so EM has all the "defense nuclear facilities" at OR.	No	Yes	Feedback and guidance; Share good practices form other sites.
SNL	Local Procedure and Master Activity Plan (assessment schedule).	None. Provide recommendations to management.	Master Activity Plan	Monthly walkdowns. Only 2 facilities.	CSEs participate in he walkdowns. CSEs do qtrly system assessments.	Annually	No- no new projects at SNL	Weekly meetings	Daily communication and weekly formal meetings.	No answer	ID and grouping of systems; Clarification of SSO role.	Would like clearer definition of SSO functions and responsibilities.	(From Feb 08 teleconference) Yes. Would enhance portability of SSO qualifications.	(From Feb 08 teleconference) Accept the site office method of oversight by examining contractor self assessment.
SRS	Local directive plus individual performance plan.	None	Annual plans	In fy07, AM Waste Disp: 11 assessments, 4 included walkdowns AM Nuke Stab: 18 assessments, all with walkdown.	AM Waste Disp: 5 of the 11 included CSE AM Nuke Stab: all 18 included CSE.	AM Waste Disp: 2 of 11 AM Nuke Stab: all 18 covered elements of CM.	For new projects in existing facilities, Fac Eng part of project teams. For totally new items, Fac Engs not assigned till near operation. Provide matrix support as needed:	Work closely with CSE and Safety Basis engineers. Have access to contractor data systems. Review CSE products,; convey issues via COR.	Same as ←	Same as ← Use contractor data systems, see contractor drawings, calculations, and system health reports.	No changes to function, but significant attrition in qualified staff.	Has provided comments on the Manual revision.	No. Recommend finishing the FTCP Manual revision and seeing if a Standard is needed.	CNS and Program Office SMEs have helped. LL and feedback form HQ assessments would help.
Y-12	YSO FRAM, YSO Management System Description, and YSO SSO Program Procedure.	Stop Work; Corr. action validation for their findings; Rvw applicable portions of contractor Performance Evaluation Plan and incentive.	Yes-YSO Master Assessment Plan and Schedule.	Walkdown one system per quarter, cover all in 3 yrs. Each SSO assess one HEUMF construction project monthly; One Conduct of Engineering (CoE) assessment Annually.	One joint assessment of a safety system yearly plus one joint assessment of a programmatic aspect of Conduct of Engineering.	Same as ←	Yes-CD reviews and const. walkdowns. Now 10-25% of SSO time and growing.	Frequent informal contact; CSEs notify CSOs of occurrences. Work with contractor Design Authority Reps.	SSOs work with contractor engineering, maintenance, QA, and Config Mgt orgs.	Serve on Project and Safety Basis Review teams for annual SAR update and major changes.	SSOs assigned to systems; More new design review workload; formed teams to coordinate Fed oversight areas; formalized SSO/FR issue handoff process.	No	No	Need SSO champion
ID	ID FRAM, ID SSO Program Description, staff Position Descriptions and Performance Agreements.	SSOs review procurement, maintenance, and startup docs; Provide input to Fed approval authorities.	Annual Oversight Plan	EM: All systems touched at least annually. NE: 4 or 5 of the 21 systems will be reviewed in the 2008 plan, expect ad-hoc walkdowns also.	EM: Part of annual Vital Safety System Surveillance NE: done in 2007, not planned for 2008	EM: part of annual Vital Safety System Surveillance. NE: all ATR systems hit over the last 3 year reconstitution process. 2007 one ATR critical facility VSS. 2006 one ATR VSS.	Yes-SSOs are also NSS reviewers for new facilities.	Scheduled periodic meetings, SSOs shadow CSE assessments and reviews, CSE interviews as part of DOE oversight reviews.	SSOs interact with many contractor engineering, maintenance, and operations orgs.	Documents needing DOE approval are routed thru SSOs. ID has an on-line matrix of who approves what. SSOs have input to approvals.	ID implemented SSO coverage for non-Defense Nuclear Facilities. Addition of former ANL-West and the contract split between EM and NE facilities complicates implementation.	No	IF so, it should standardize SSO staffing complex-wide. At ID, some SSOs assignments are collateral duties for Nuclear Safety Specialists (NSS) while others are assigned as a function (i.e. Fire Protection).	Specific guidance as to "what" and feedback on local directives. Ensure flexibility in methodology. Specifically, facility/system vs. engineering discipline approach. Development of SSO metrics

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RL	Local directive	Safety Basis Docs; Verify closure of assessment items; System Notebook; Special Tests.	Annual assessment schedules	Qtrly System Walkdown	"Many- see the schedule." (didn't see any CSE Prog evals)	"All walkdowns, surveillances, and assessments are Config Mgt evals."	Yes, but that is rare at this cleanup site	Frequent and close. All SSOs know their counterparts .	SSOs observe Contractor Independent Assessment Team work and validate their performance.	Not answered	Creation of contractor system engineer program.	No	No	"Not an issue."
ORP	Local SSO Program Plan	Safety Basis Amendment Review Team members; Verify closure of their own assessment findings.	Formal schedule that includes "VSS" assessments	TF: Walk each system monthly. WTP: Under construction, but SSOs must do 70 hours of field observations annually.	TF: Done in 2006, again in 2009 WTP: None- not built yet	TF: Included in all walkdowns and other looks. WTP: Program level reviews.	Yes.	TF: Frequent and routine contact. WTP: N/A, not operational	TF: SSOs interact with many contractor levels and orgs. WTP: SSOs work with designers frequently.	Not answered	TF CSEs have been improved and their role expanded. WTP: Application of SSOs to design and construction is new.	Clear expectation for SMEs to oversee Safety Management Programs (SMPs). Want SME coverage of SMPs similar to SSOs to Systems.	No opinion	Don't need any.
NSO	FTCP Man, NSO M 426.X-1	'Yes' to list, noted in cited NSO manual.	Yes- Master	Monthly on 12 systems- NSO Manual	All SC/SS/ITS DAF systems 'baselined'- included CSE Evaluations.	Same as ←	Time permitting. Resources tight.	Wkly SSO / CSE mtgs	CSEs, Cont. mgt, QA org, etc have SSO interface.	None unless reqd in CAP or doc requires Fed approval.	Local qual card/std Baseline assessments done.	FTCP Man more like FR STD- more defined duties/resp.	Yes-would provide consistency across NNSA.	At NSO or DNFSB point of contact is fully engaged in the SSO program. HQ involvement can be more engaging.'
LASO	LASO MP 06.02	Stop Work and xmit final rpts to Cont (under COR sig).	Yes-LASO Integrated Assessment Plan.	6 planned for FY08. SSO and FR staff will also shadow cont. safety assessments.	None by SSO- No resources. Will be covered by Perf. Based Incentive process.	To be included in planned walkdowns.	No. New project support comes from NNSA-SC.	SSO mgr (who is only SSO) has ad-hoc encounters, plus attends mgrs mtg.	Facility Ops Directorates, Engineering Div, and CSEs who report to both orgs.	None reported	During LASO reorg, lost entire program, then went to 0.5 FTE (the SSO prog mgr) and now plan to get 2 more SSO staff.	Ensure separation between design engineers and SSO functions.	No	Set clear program expectation. Either raise to FR-like program or let sites grade SSO program to risk and staffing. Need standard CRADs. Need standardized implementation.
PXSO	PXSO operating procedure modeled on FTCP Manual Chap III sec 1.	Stop Work (like all PXSO staff). SSOs provide review comments, etc through COR.	Yes. Annual schedule in tracking system. (*Pegasus*) Each SSO performance plan requires a number of assessments and observations.	Each SSO assigned 2 formal assessments annually, plus at least one observation (walkdown) every 2 months.	Annually since DOE O 420.1 issued. Will shift to biennial with more program maturity.	Config Mgt covered during formal system assessments.	SSOs participate in Fed Project Team reviews (~2 weeks) of new designs . Recent funding restraints cause reduced involvement.	Formal mtg every 2 weeks + daily interactions on issues+ SSO access to CSE products/ reports.	SSOs interact mainly with CSEs, Fire Protection, Config Mgt.; Less often with safety basis and design shops.	Electronic access to contractor reports and docs, but not routed for review.	PXSO set up Fed Sys Eng org with DOE-O 420.1, and then changed the Sys Eng group to SSOs. This allows Fac Reps to focus on other problem areas.	SSOs focus on active systems credited in the DSA. Safety Mgt Sys in the DSA should be covered by SMEs, not SSOs, since they don't have an equivalent of a CSE.	No, and no changes to the FTCP chapter.	HQ support should mirror that provided to the FR program,.
LSO	Local SSO procedure, LSO FRAM, SSO PDs and Performance Plans.	No direct authority. Provide input to the OCR through the Ops Team and am-Ops.	Yes- Annual schedule in *Pegasus* for walkdowns /assessments, plus formal reviews every 3 years.	Number varies, but last year was 125.	Covered by ← plus formal review every 3 years.	Formal reviews part of 3-year cycle. LSO also has special oversight of CM.	Limited due to absence of "new" projects. Mostly system mods.	Ops Team approach includes frequent interaction with CSEs at routine meetings, reviews, etc.	SSOs interact most with CSE Program Manager and CSEs, plus facility mgrs, QA, etc.	Not routed, but Sos have electronic access to all.	Originally, SMEs served as SSOs. LSO assigned dedicated SSOs for FY 06. Better system focus since the SSOs are more "field" oriented and have free access to facilities.	No	No. Site SOPs can cover everything. Consensus engineering Standards sufficient.	Get web access to consensus Standards; Develop DOE/NNSA positions for global system issues like HEPA filters. Clarify "what" and stay out of "how."