U.S. Department of Energy	Subject: Nuclear Facility Safety System Functionality Inspection Criteria, Inspection Activities, and Lines of Inquiry	HS: HSS CRAD 64-17 Rev: 0 Eff. Date: 09/25/2009
Office of Independent Oversight	for Tom Staker Director, Office of ES&H Evaluations Date: 9-25-09	
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1.0 PURPOSE

Within the Office of Independent Oversight, the Office of Environment, Safety and Health Evaluations' mission is to assess the effectiveness of those environment, safety, and health systems and practices used by line and contractor organizations in implementing Integrated Safety Management; and to provide clear, concise, and independent evaluations of performance in protecting our workers, the public, and the environment from the hazards associated with Department of Energy (DOE) activities and sites. A key to success is the rigor and comprehensiveness of our process; and as with any process, we continually strive to improve and provide additional value and insight to field operations. Integral to this is our commitment to enhance our program. Therefore, we have revised our Inspection Criteria, Inspection Activities, and Lines of Inquiry for internal use, and we are making them available on this webpage for use by DOE line and contractor assessment personnel in developing and implementing effective DOE oversight and contractor self-assessment and corrective action processes.

2.0 APPLICABILITY

The following Inspection Criteria document is approved for use by the Office of ES&H Evaluations.

3.0 FEEDBACK

Comments and suggestions for improvements of these inspection criteria, activities, and lines of inquiry can be directed to the Director of the Office of ES&H Evaluations on (301) 903-5392.

Nuclear Facility Safety Systems Functionality
Inspection Criteria, Inspection Activities, and Lines of Inquiry

Scope: The Nuclear Facility Safety Systems Functionality inspection will evaluate the effectiveness of established engineering and related quality assurance programs and processes for configuration management, surveillance and testing, maintenance and procurement, operations and operator training, and technical support from the cognizant system engineer (CSE) program and oversight by the Federal safety system oversight (SSO) personnel. This review will evaluate the effectiveness in maintaining the functionality of the nuclear facility safety systems (e.g., safety-class and safety-significant) to ensure they are capable of performing their credited safety function in accordance with the facility's safety basis.

I. Safety System Functional Definition and Configuration Management

Inspection Criteria:

- Configuration management processes are established and implemented in accordance with DOE Order 420.1B, *Facility Safety,* DOE-STD-1073-2003, *Configuration Management Program;* DOE Order 413.3, *Program and Project Management for the Acquisition of Capital Assets;* ANSI/EIA-649, *National Consensus Standard for Configuration Management;* and ISO 10007: 1995(E), *Quality Management – Guidelines for Configuration Management;* and 10 CFR 830, Subpart A, *Quality Assurance Requirements;* and ASME NQA-1, *Quality Assurance Requirements for Nuclear Facilities Applications, Requirement 3, Design Control.*
- Technical, functional, and performance requirements for the safety system are specified in (or referenced in) the facility authorization basis documents. Safety/authorization basis documents identify and describe the system safety functions and any essential supporting systems, and these criteria are translated into design calculations and procedures in accordance with 10 CFR 830, Subpart B, *Safety Basis Requirements,* and DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis.*
- Configuration management process adequately integrates the elements of system requirements and performance criteria, system assessments, change control, work control, and documentation control in accordance with DOE Order 420.1B, *Facility Safety.*
- Configuration management is used to develop and maintain consistency among system requirements and performance criteria, documentation, and physical configuration for the systems, structures and components (SSCs) within the scope of the program in accordance with DOE Order 420.1B, *Facility Safety.*
- Key design documents must be identified and consolidated to support facility safety basis development and documentation in accordance with DOE Order 420.1B, *Facility Safety,* and DOE-STD-3024-98, *Content of System Design Descriptions.*
- System design basis documentation and supporting documents are kept current using formal change control and work control processes in accordance with DOE Order 420.1B, *Facility Safety.*

- Changes to system requirements, documents, and installed components are formally designed, reviewed, approved, implemented, tested, and documented in accordance with DOE Order 420.1B, *Facility Safety*.
- An unreviewed safety question (USQ) process has been established in accordance with 10 CFR 830 and is being appropriately implemented to control changes to safety systems including documents governing work on the systems.

Inspection Activities: Review the design and safety basis documents, such as calculations and analyses for the selected system(s) and review the functional requirements for the system and each active component to verify: (1) specific role of the safety system for detecting, preventing, or mitigating analyzed events; (2) associated conditions and assumptions for system performance; and (3) requirements and performance criteria for the system and its active components, including essential supporting systems, for normal, abnormal, and accident conditions relied upon in the hazard or accident analysis.

Selectively walk-down system equipment and components and compare the actual physical installation of the system to documentation of the system design and safety basis and verify if the drawings which reflect the as-built design and installation are consistent with the current design for the facility. Verify that system installed configuration will support system function under accident/event conditions.

Evaluate the drawing control, the control and use of design information, including system design descriptions and design calculations from the perspective of modifications made to the selected system.

Review selected design modification and procurement packages made to the system that could have potentially changed the design and safety basis. Verify if the system meets the design and safety basis in the as-modified configuration. Ensure that all changes to the support elements have been made, including maintenance requirements and procedures, software, operating procedures, training documentation and training programs, periodic testing, and procurement documentation and specifications. Verify if system modifications implemented have introduced any unreviewed safety questions.

Interview individuals responsible for processing selected changes made to the system requirements, installed equipment, and associated documents.

Review institutional and facility-specific USQ procedures and the documented USQ screens and determinations.

Inspection Lines of Inquiry:

- Are the system design basis and supporting documents identified and consolidated in documentation consistent with DOE-STD-3024 on system design descriptions?
- Has the completed design been recorded in design output documents, such as drawings, specifications, test/inspection plans, maintenance requirements, and reports?
- When design basis information is not available, does the documentation include system requirements, basis for the system requirements, essential performance criteria, and a

description of how the current system configuration satisfies the specified requirements and performance criteria?

- Do the bases for technical safety requirements (TSRs) for the system appropriately reflect assumptions of facility configuration and performance of safety functions, operational parameters, and key programmatic elements?
- Is the safety classification of the system (or credited structures and components of the system) commensurate with the level of consequence and consistent with DOE guidance?
- Have the design bases and design assumptions identified in the safety analysis been appropriately translated into design calculations and procedures?
- Are acceptance criteria for tested parameters supported by calculations or other engineering documents to ensure that design bases assumptions are met?
- Are operation and system alignments consistent with design basis assumptions?
- Have as-built drawings been maintained after production to show actual configuration?
- Are materials and installation of system components consistent with the requirements and performance criteria for the system, including quality controls and quality assurance and as appropriate software quality assurance?
- Does the site quality assurance/control program govern the specification, purchase, inspection, acceptance testing, and maintenance of components, and does the program comply with DOE quality assurance requirements?
- Are system components properly labeled to assure proper configuration and operation?
- Do identified discrepancies (i.e., system changes) potentially impact (1) the operability or reliability of the system; or (2) the adequacy of the change control or document control processes applied to the system (e.g., presence of unauthorized changes or failure to properly document authorized changes)?
- Are documents affected by the changes appropriately identified?
- Are changes accurately described and reviewed and approved, as appropriate?
- Are systems, structures, and components affected by the changes identified by facility management, users, operators or others affected by the changes?
- Do facility procedures ensure that changes to the system requirements, documents, and installed components are adequately integrated and coordinated with those organizations affected by the change?
- Are changes to the system reviewed to ensure that system requirements and performance criteria are not affected in a manner that adversely impacts the ability of the system to perform its intended safety function?
- Are installation instructions and post-modification testing instructions and acceptance criteria appropriately specified?
- Are safety basis and design documents affected by the change revised and kept current using formal change control and work control processes?
- Are new design calculations, tests, or procedures required to support the change?
- Has the facility evaluated the technical resources needed to maintain and operate new equipment/systems from modifications/facility upgrades? Has maintainability issues been adequately addressed?
- Is there adequate evidence that the CSE has reviewed and concurred with design changes and the associated system modification work package?

- Are engineering (including the design authority and technical disciplines), operations, and maintenance organizations made aware of system changes that affect them and appropriately involved in the change process?
- Are other organizations affected by the change such as training, document control, hazard analysis/safety basis, fire protection, etc., integrated into the change process?
- Does the USQ process conform to the requirements of 10 CFR 830.203 and DOE guidance?
- Have design changes been appropriately evaluated using the USQ process?
- Has a USQ determination been made on potential inadequacies of the documented safety analysis which were identified?

II. Maintenance and Procurement

Inspection Criteria:

- A nuclear facility maintenance management program has been established in accordance with 10 CFR 830, Nuclear Safety Management, Subpart B, *Safety Basis Requirements,* DOE Order 433.1A, *Maintenance Management Program for DOE Nuclear Facilities,* ASME NQA-1, *Quality Assurance Requirements for Nuclear Facilities Applications, Requirement 12 – Control of Measuring and Test Equipment,* and DOE Order 430.1B, *Real Property Asset Management.*
- The safety system is included in the established master equipment lists (MEL) of structures, systems, and components (SCCs) of the nuclear facility maintenance management program and the DOE-approved Maintenance Implementation Plan as required by DOE Order 433.1, and the system is maintained in a condition that ensures its integrity, operability, and reliability.
- Maintenance processes for the system are in place for corrective, preventive, and predictive maintenance and to manage the maintenance backlog; and the processes are consistent with the system's safety classification.
- The system is periodically inspected in accordance with maintenance requirements.
- Maintenance activities associated with the system, including work control, post-maintenance testing, material procurement and handling, and control and calibration of test equipment, are formally controlled to ensure that changes are not inadvertently introduced, the system fulfills its requirements, and that system performance is not compromised.
- Processes are established for procurement and verification of items and services and ensure that approved suppliers continue to provide acceptable items and services in accordance with ASME NQA-1, *Quality Assurance Requirements for Nuclear Facilities Applications, Requirement 4 – Procurement Document Control, Requirement 7 - Control of Purchased Items and Services, Requirement 8 – Identification and Control of Items, Requirement 15 – Control of Nonconforming Items.*

Inspection Activities: Review the maintenance program for the selected key components of the safety system to determine if preventive maintenance requirements are adequate and comprehensive. Review applicable vendor manuals, lessons learned documentation and verify they have been appropriately evaluated and integrated and implemented into the maintenance program.

Conduct an in-depth system walkdown. Evaluate material condition of observed equipment. Verify if system components are being adequately maintained to ensure their operability under all accident conditions.

Review work packages and system or component history files related to the system for selected system components for the past 3 years. Look for recurring equipment problems and attempt to verify if any trends exist.

Review corrective action documentation/databases, occurrence reports, etc., and interviews with maintenance technicians and system engineers to identify equipment maintenance problems related to the safety system that may have occurred, with emphasis on equipment: (1) that has a history of recurring failures; (2) whose failure resulted in the safety system actuating: and (3) whose failure resulted in reduced performance or unavailability of the safety system. Select several items for which the inspector has determined that the problem may have been caused by inadequate maintenance for follow-up.

Inspection Lines of Inquiry:

- Are maintenance source documents such as vendor manuals, industry standards, DOE orders, and other requirements used as technical bases for development of system maintenance work packages?
- Is the system inspected periodically according to maintenance requirements and are deficient conditions evaluated and or corrected?
- Are acceptance criteria defined and used for system modification, repair, maintenance and test activities?
- Are excessive component failure rates identified?
- Are failure rates used in establishing priorities and schedules for maintenance or system improvement proposals?
- Has preventive maintenance been performed as prescribed?
- Has the corrective maintenance backlog been effectively managed?
- Is there an accurate maintenance history that compiles maintenance, resource, and cost data in a system which is retrievable and capable of entering required-maintenance costs, actual maintenance costs, and availability data and failure rates for mission-critical and safety systems into the DOE Facility Information Management System?
- Does the facility receive notifications of defective, premature failure, incompatible material, etc. reports from industry sources? How does the facility disposition applicable reports?

Inspection Activities: Witness any maintenance performed on the selected system. Verify for each activity observed the technical adequacy of procedures, performance of appropriate post-maintenance testing, and satisfactory demonstration of return of equipment and system operability. Check the procedure content against vendor manuals to verify that the procedure satisfies the vendor requirements for maintaining the equipment in proper working order.

Inspection Lines of Inquiry:

- Do personnel performing inspections understand operational features, safety requirements, and performance criteria for the system?

- Are inspections sufficiently detailed to verify emergent conditions requiring corrective maintenance?
- Are conditions adequately evaluated to ensure the system is capable of performing its safety related functions?
- Do routine or special inspections look for suspect/counterfeit parts and are maintenance personnel trained in identifying suspect/counterfeit parts?

Inspection Activities: Review maintenance and system engineering records, plans, backlogs/deferred maintenance records, system health reports, facility and system condition assessment reports, and schedules, etc., for aging system equipment and components. Review applicable in-service inspection (ISI) program plans, schedules, and records for the system. Determine if the maintenance program effectively addresses age-related system degradation that could affect system reliability or performance.

Inspection Lines of Inquiry:

- Does the nuclear facility maintenance program include condition assessments, prioritization of maintenance projects, management of deferred maintenance, analyses to determine optimal period for maintenance actions, and reporting results of condition assessments to DOE, as required by DOE O 430.1B?
- Are conditions that require component replacement identified?
- Is component aging incorporated into preventive maintenance?
- Does the DOE approved Maintenance Implementation Plan adequately addresses periodic inspection of components for aging and replacement?
- Has the responsible DOE line management ensured that sufficient resources are budgeted in a timely manner to accomplish the maintenance program's objective of providing DOE with the highest confidence in the reliable performance of mission-critical, safety systems through proactive maintenance practices?

Inspection Activities: Review selected procurement packages and records for selected safety system components and services. Determine whether: (1) the specified design parameters are in accordance with the safety basis; (2) procurement specifications identify the applicable technical and quality assurance requirements (i.e., codes and standards); and (3) the supplier is on the approved list of suppliers.

Where certificate of conformance (COC) is used for acceptance, determine whether specifications address: (1) purchased material or item; (2) specific requirements met and not met; (3) evidence of supplier quality assurance (QA) review; (4) procedures or quality assurance program to be followed; (5) receiving inspection means to determine that purchaser/agent has verified by audit the validity/effectiveness of the supplier's COC system.

Verify established processes for dedicating commercial grade components for safety-related applications are being effectively implemented.

Determine whether receiving inspection records are available and whether identified discrepancies are reviewed by QA/engineering for proper disposition.

Examine material receiving inspection records and determine compliance with acceptance requirements.

Walkdown storage areas and determine whether storage activities are in compliance with QA requirements for storage of safety-related items.

Inspection Lines of Inquiry:

- Are procurement processes defined within the site/facility quality assurance program and include provisions for supplier qualification, receipt inspection, and document management?
- Are components and services procured for the system obtained in accordance with the site/facility quality assurance program?
- Are critical or important acceptance parameters and other requirements, such as inspection/test equipment or qualified inspection/test personnel, specified in design documentation?
- Are appropriate qualified personnel performing commercial grade dedication?
- Are installation instructions and post-modification testing instructions and acceptance criteria appropriately specified?
- Are inspections and tests performed to verify that physical and functional aspects of items, services, and processes meet requirements and are fit for use and acceptance?
- Has the system been evaluated for potential inclusion of suspect/counterfeit parts?
- Are the results of receipt inspections clearly shown on the part via acceptance tags, etc., and are nonconforming material clearly tagged and separately stored to prevent inadvertent use?
- Are safety items appropriately identified and segregated from normal stock to indicate status and ensure proper application?
- Are materials and equipment stored in a manner that provides for maximum protection and ready availability? Are materials and equipment stored with due considerations for environmental conditions?

III. Surveillance and Testing

Inspection Criteria:

- Surveillance and testing of the system demonstrates that the system is capable of accomplishing its safety functions and continues to meet applicable system requirements and performance criteria.
- Surveillance and test procedures confirm that key operating parameters for the overall system and its major components remain within safety basis and operating limits.
- The acceptance criteria from the surveillance tests used to confirm system operability are consistent with the safety basis.
- Instrumentation and measurement and test equipment for the system testing are calibrated and maintained.

Inspection Activities: Review surveillance and/or testing procedures, and the supporting DSA TSRs and bases for the system and major components and a sample of the test results.

Conduct a walkthrough of selected surveillance test procedures with appropriate facility personnel (e.g., test technicians, system engineers, operations personnel). Ascertain if

engineering and technical support personnel contribute to the adequacy of surveillance test procedures and if they review test results.

Witness any surveillance tests performed on the selected system.

Verify that the system has been tested in accordance with the accident analysis. Verify if the testing adequately ensures that the system will operate as designed under postulated accident conditions. Ascertain if surveillance test procedures comprehensively address system responses addressed in the safety basis.

Compare the acceptance criteria from reviewed surveillance test procedures with the safety functions, functional requirements, performance criteria, assumptions and operating characteristics discussed in safety documents, including supporting calculations. Verify that there is a clear linkage between the test acceptance criteria and the safety documentation, and that the acceptance criteria are capable of confirming that safety/operability requirements are satisfied.

Review test records to: (1) verify testing is being performed as required by TSR requirements, and (2) identify any adverse trends and test failures. Discuss with system engineering root causes of any test failures noted.

Inspection Lines of Inquiry:

- Does the procedure contain instructions to perform the test successfully and assure validity of test results?
- Are key parameters used to verify that system performance meets system requirements and performance criteria appropriate for the current mission?
- Can parameters that demonstrate compliance with the safety basis be measured or physically verified?
- Does the system design include provisions necessary for conducting the tests?
- Are personnel knowledgeable and able to satisfactorily perform the test?
- Does the procedure cite applicable safety requirements?
- Are limits, precautions, system and test prerequisite conditions, data required, and acceptance criteria included?
- Is testing performed to demonstrate as-found conditions to determine whether degradations of such equipment may be occurring that might prevent the equipment from performing its safety function in an accident condition, so that corrective actions can be taken to restore the required assurance?
- Do test procedures include warm-ups, adjustments, and other departures from as-found conditions (commonly termed preconditioning) can invalidate such testing and inspections?
- Are other preventative maintenance type activities routinely conducted along with surveillance tests such that sequencing of multiple tasks could also invalidate such testing and inspections?
- Are appropriate data recording provisions included or referenced and used to record results?
- Does the procedure include provisions for listing discrepancies?
- Does the procedure require timely notification to facility management about any failure or discrepancy that could impact operability?

- Did appropriate personnel review the test results and take appropriate action?
- Is there a clear linkage between the test acceptance criteria and the safety documentation, and are the acceptance criteria capable of confirming that safety/operability requirements are satisfied?
- Was the installed and/or portable test equipment used for the surveillance calibrated?
- Are the results of surveillance tests trended to detect system degradation and/or to identify potential system reliability issues?

IV. Operations and Operator Training

Inspection Criteria:

- Safety system operating procedures are technically accurate to achieve required system performance for normal, abnormal, remote shutdown, and emergency conditions in accordance with administrative controls within the facility's approved TSRs, and DOE O 5480.19, *Conduct of Operations Requirements for DOE Facilities.*
- Operations personnel are knowledgeable of safety system design and performance requirements in accordance with the facilities safety basis. Operations personnel are trained on proper system response, failure modes, and required actions involved in credible accident scenarios in which the system is required to function in accordance with DOE O 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities.*
- Formal processes have been established to control safety system equipment and system status to ensure proper configuration control is maintained in accordance with DOE O 5480.19, *Conduct of Operations Requirements for DOE Facilities.*

Inspection Activities: Selectively review the technical adequacy and accuracy of system alarm response procedures and operating procedures for normal, abnormal, and emergency system operations.

Review operator training for the system, focusing on the technical completeness and accuracy of the training manual and lessons plans. Ensure that lessons plans reflect the system modifications and that operators' have been trained on these modifications.

Conduct interviews with operators to verify how the system is operated. Verify if system operation is consistent with the safety basis.

Inspection Lines of Inquiry:

- Are operators knowledgeable of the system operation, its role in accident mitigation, safety limits, and determinations of operability?
- Is the system operated in accordance with the system design?
- Are personnel trained and qualified to ensure they are capable of performing their assigned work? Are personnel provided continuing training to ensure that job proficiency is maintained?
- Does training reflect system modifications?
- Have operations personnel been trained on these modifications?

Inspection Activities: Conduct a walkthrough of selected system operating procedures and the system piping and instrumentation drawings with the operator(s) in the field. Confirm that valve and breaker positions required by procedure are consistent with those on controlled plant drawings and system lineup procedures.

Verify the local operation of system equipment. Ascertain whether the indication available to operate the equipment is in accordance with applicable operating procedures. Verify that the environmental conditions assumed under accident conditions are adequate for local operation of equipment.

Inspection Lines of Inquiry:

- Can the procedures be performed as written?
- Are components and equipment accessible for normal and emergency conditions?
- If special equipment is required to perform procedures or operations, is the equipment available and in good working order?
- Is the knowledge level of the operator(s) adequate concerning equipment location and operation?
- Is the indication available to operate the equipment in accordance with applicable operating procedures and instructions?
- For accident conditions, are the environmental condition assumptions adequate for remote operation of the equipment?
- Are support systems and procedures adequate to support the system during event sequences when the system is designed to initiate?

Inspection Activities: Identify any existing equipment tag-outs for the selected system. Verify if tagout is adequate for the work to be accomplished.

Review jumper, lifted lead, and other temporary modification logs. Verify if an adequate technical review was performed before plant modification was performed, and if plant drawings were updated as needed, to reflect the change before operators must operate the plant as changed. Ascertain if temporary modifications, lifted leads and jumpers are properly reviewed, approved, and controlled.

Inspection Lines of Inquiry:

- Were equipment tags properly hung and equipment placed in the appropriate designed position?
- Are appropriate controls in place to ensure independent verification of equipment status?
- Is appropriate operability verification testing performed when returning equipment to service?
- Are there appropriate controls to limit the duration of temporary modifications?
- Are appropriate engineering and system engineering groups involved in temporary modifications?

V. System Engineering and Safety System Oversight

Cognizant System Engineering

Inspection Criteria:

- The DOE contractor has established an effective cognizant system engineer (CSE) program as defined in DOE Order 420.1B to ensure continued operational readiness of identified systems to meet their safety functional requirements and performance criteria.
- CSEs are effectively maintaining overall cognizance of their assigned systems and are responsible for system engineering support for operations and maintenance, and ensure effective configuration management of assigned system(s).
- CSEs are appropriately involved and integrated into configuration management processes and ensure changes to assigned system design requirements, physical configuration, or documentation (including analysis, drawings, and procedures) are controlled and effectively implemented in accordance with established configuration management program requirements.
- CSEs are effectively providing technical assistance in support of line management safety responsibilities and ensure continued system operational readiness.

Inspection Activities: Review contractor's cognizant system engineering program description and procedures, training and qualifications requirements. Verify CSE program requirements and assigned CSE responsibilities are consistent with DOE Order 420.1B.

Review system modification, maintenance, and procurement work packages. Verify if CSEs are appropriately involved in ensuring changes to assigned systems are being controlled and effectively implemented in accordance with established configuration management processes.

Review sample database records of system deficiencies, problems, engineering issues, and corrective actions, engineering evaluations and operability determinations. Ascertain if CSEs are appropriately involved in determining system operability, correcting out of specification conditions, and evaluating questionable system performance data.

Review CSE system notebook/logs, system health reports, system assessment reports, performance indicators and observations/findings from oversight activities. Interview CSEs, design engineers, technicians, and engineering management. Ascertain if CSEs are maintaining sufficient cognizance of assigned systems operational performance.

Inspection Lines of Inquiry:

- Are CSEs appropriately integrated into configuration management, work control, and safety basis processes and procedures in order to maintain cognizant of potential changes to system functional and performance requirements and system operational performance?
- Are CSEs familiar with system's engineering documents (e.g., drawings, calculations, system design descriptions), maintenance and procurements activities, surveillance tests, and with existing system condition and performance?

- Does CSE training include knowledge of facility and system safety basis, applicable codes and standards for design and maintenance, failure modes and effects analysis, root-cause analysis, performing periodic system walk-down and reviews, and preparing system health reports?
- Are CSEs involved in troubleshooting and repair of assigned safety systems and components, including establishing of post-maintenance testing requirements?
- Do CSEs periodically review results of required TSR surveillance testing for assigned systems (in addition to failed TSR surveillance tests)?
- Do CSEs provide assistance to operations in determining system operability and is there a formal process established for conducting system operability determinations?
- Are qualification and training requirements for CSE adequately defined and implemented?
- Is an appropriately qualified and experienced CSE assigned to each system within the scope of the program?
- Are CSE functions, responsibilities and authorities clearly defined?
- Do CSEs provide technical support for operations and maintenance through the activities described in DOE O 420.1B, including review of design changes, ensuring effective configuration management, identifying trends in key system parameters from operations and surveillances, determining operability, performing analysis of problems, and initiating corrective actions?
- Is system configuration formally controlled and managed to develop and maintain consistency among system requirements and performance criteria, documentation, and physical configuration of the system?
- Do system assessments include periodic reviews of system operability, reliability, and material condition?
- Are CSEs trending safety system performance?
- Are detailed and comprehensive (e.g., DNFSB Recommendation 2000-2 type) safety system assessments performed and periodically scheduled?
- Do system assessments include appropriately qualified experts in the necessary engineering and other disciplines?

DOE Safety System Oversight

Inspection Criteria:
The DOE site office has established and implemented an effective Safety System Oversight (SSO) program for qualifying staff to apply engineering expertise in its oversight of the assigned safety systems, and to monitor performance of the contractor's CSE program.

Inspection Activities: Review the DOE site office's SSO program description and SSO training and qualification requirements. Review the previous and present oversight assessment plans and schedules of planned surveillance and assessment activities. Review surveillance and assessment reports prepared by SSO personnel. Follow up on sample SSO findings to ascertain how they are tracked and resolved.

Interview SSO personnel and walkdown assigned systems, as necessary with SSO personnel. Ascertain if SSO are actively involved in overseeing contractor CSE program and knowledgeable of assigned system performance.

Inspection Lines of Inquiry:

- Has the SSO program established appropriate training, qualification, and performance requirements for SSO personnel?
- Are safety system oversight personnel appropriately trained and qualified to perform their assigned duties?
- Is an appropriately qualified and experienced SSO staff assigned to each safety system?
- Has the site office developed an adequate plan and schedule for periodic assessments of all the safety systems at different nuclear facilities within its purview?
- Are the functions, roles and responsibilities of SSO personnel clearly defined?
- Do SSO personnel perform periodic assessments of system performance, equipment configuration, and material condition of assigned systems?
- Are SSO findings adequately tracked and resolved?
- Do SSO personnel assess contractor's CSE program to ensure operability, reliability, material condition, and performance of the assigned safety systems?