

October 11, 2013

To: J. N. McKamy, Director, NA-00-10, Manager US DOE NCSP  
From: D. G. Erickson, Deputy Chair US DOE NCSP CSSG *dge*  
Subject: CSSG Tasking 2013-04 Response

The CSSG has completed its action on Tasking 2013-04, CSSG Assessment of Y-12 NCS Operational Review and Evaluation Implementation Process.

This report was developed by a sub-team of the CSSG, along with several ad-hoc members. The team membership is listed in the attached report.

The report was reviewed by the entire CSSG and their comments incorporated. It was provided to the Y-12 NA-00-NPO and contractor for factual accuracy review. Comments received have been incorporated, as deemed appropriate, in the final version of the response, attached to this memo.

Cc: CSSG Members  
M. Dunn  
A. N. Ellis  
K. Hahn  
J. E. Hicks  
K. Ivey  
T. Kauerz  
G. O. Udentia

## CSSG Assessment of Y-12 NCS Operational Review and Evaluation Implementation Process

The Criticality Safety Support Group (CSSG) was directed via Tasking 2013-04 to support an NPO assessment of the current state of the Y-12 NCS Operational Review Process (e.g., ANSI/ANS-8.19-2005 §7.7 and 7.8 or other appropriate sections) and identify recommended improvements to reduce infraction events, the contractor's process for implementing evaluations, and the initiatives the NCS program is focusing on per the NCS Improvement Plan to ensure they are the most pressing. A copy of the approved Tasking 2013-04 is included as Attachment 1. A copy of the approved Operations- Level Review Plan is included as Attachment 2.

**Summary:**

The review team consisted of the following members:

Ken Ivey, NPO-10, Review Team Lead  
Trey Kauerz, NPO-10, Deputy Team Lead  
David Erickson, SRNS, CSSG Team Lead  
Bob Wilson, DOE-EM, CSSG  
David Hayes, LANL, CSSG,  
Jerry Hicks, NA-SH  
Kevin Hahn, NA-SH,  
Roger Liddle, NA-00 (Observer)

The scope of the review included the following elements:

1. **The Operational Review Process (ORP).** Comprehensive review of the processes by which NCS controls are reviewed for compliance with the applicable Criticality Safety Evaluation (CSE), as required by *Nuclear Criticality Safety Operational Review Program, Y70-68-002*.
2. **Implementation of NCS Controls (INC).** This covers the process of creating and executing NCS implementation plans for fissile processes. This will also include any major efforts to revise existing implementation plans such as in the *Nuclear Criticality Safety Implementation Review Action Plan, RP-YAREA-F-0212*.
3. **NCS Improvement Plan (IP).** The team will evaluate the effectiveness of tasks completed as part of the *Nuclear Criticality Safety Program Strategic Vision for the Y-12 National Security Complex, Y/DD-1379, Rev. 1*.
4. **NPO Oversight Process (OP).** The team will assess how the NNSA Production Office plans and performs its oversight mission as implemented through the oversight of NCS. This is documented in procedures such as *NPO Oversight Process, NPO-3.4.1.1*.
5. **NCS Oversight Program (CS.O).** The team will assess the NPO NCS engineering oversight program which is documented in *Nuclear Criticality Safety Engineering Oversight, NPO-3.4.1.1.2*. This procedure governs NCS oversight at both the Y-12 NSC and the Pantex Plant

As identified in the Operation Level Review Plan the review elements were split as follows with the indicated assignments

- Elements 1, 2, 3: Erickson, Hayes, Kauerz
- Elements 4, 5: Hahn, Hicks, Wilson

For this assessment, the team reviewed many documents, toured/walked down several facilities/operations, and participated in many interviews. An out-brief was provided to NA-00-NPO-10 and B&W Y-12 management at the conclusion of the on-site assessment. Details of the reviews, tours, interviews, and identified Findings, Performance Problems, and Best Practices are provided in the following Review Element Assessment Forms, with a separate write-up for each of the above five elements.

### **Conclusion:**

This report identified the following Findings, Performance Problems, Recommendations and Best Practices. Supporting discussion is found in the corresponding Element discussions (see bold identifier). The review performed shows that the Operational Review Process is compliant with the ANSI/ANS-8.19 standard or applicable DOE standards. The finding is associated with tracking oversight data and issues and the performance problems are areas where identified improvements would make the Operational Review Process more robust.

### Findings:

- The safety oversight data and issues are not in compatible formats, and are not readily searchable across disciplines. **(Finding OP-1)**

### Performance Problems:

- Operations Reviews have varying degrees of rigor, depending on the NCS Engineer conducting the review. Expectations should be established for the degree of rigor to be applied. **(Performance Problem ORP-1)**
- Significant effort was applied to establishing a Configuration Management (CM) baseline and implementing NCS controls in Building 9212 during restart. It appears the level of effort applied to other facilities has not caught up to that of Building 9212. **(Performance Problem ORP-2)**
- Operations Reviews are not consistently performed on the annual frequency required per the ANS/ANSI Standards. Also, although an (acceptable) three month additional grace period is provided, in a number of cases this was not met either. **(Performance Problem ORP-3)**
- No formal documented follow-up actions have been incorporated into the NCS Implementation Review Action Plan (RP-YAREA-F-0212) to ensure:
  - 1) The plan accomplished expectations,
  - 2) Expectations were appropriate based on actual outcome, and
  - 3) The action plan has long-term effectiveness. **(Performance Problem INC-1)**

- The plant Issues Management System (IMS), or some other formalized system, is not being used to track all issues generated as a result of the container verification effort in Building 9204-2E. **(Performance Problem INC-2)**
- The container/storage verification process for Building 9204-2E does not appear to have verified that all containers, or at least all legacy containers (those with indicated issues), are compliant. **(Performance Problem INC-3)**
- Criticality Safety Officer (CSO) and NCS engineer responsibilities are not consistently implemented across facilities. **(Performance Problem INC-4)**  
**Recommendation:** The Implementation Action Plan includes activities to evaluate R2A2 of CSOs and NCS Engineers relative to the operations review process. Notionally, the Implementation Plan and Operational Review processes will be combined and co-performed by CSOs and NCS engineers. This should be tracked to completion as evidenced by changes to the operations review process.
- The NCS Program Strategic Vision for the Y-12 National Security Complex (Y/DD-1379, Rev. 1) has not been updated since July 2011, although the document states that it "...will be reviewed and updated each year as a part of a continuous improvement process." **(Performance Problem IP-1)**
- The NPO FRAM references the NNSA FRAM that was cancelled before the NPO FRAM was issued. **(Performance Problem OP-2)**
- The definitions for the various types of issues in NPO- 3.4.1.2.1, Rev. 0, *NS&E Issues Evaluation and Management Process* are inconsistent with those in NPO-3.4.1.1, Rev. 0, *NPO Oversight Process*. **(Performance Problem OP-3)**

Recommendations:

- Safety impacts should be formally included in the risk determinations for oversight in the NPO oversight process document. **(Recommendation OP-4)**
- It is recommended that NPO consider basing the next official staffing analysis on detailed resource requirements for the work required by the safety oversight procedures, with input from senior safety staff. **(Recommendation OP-5)**
- NPO should consider sending the facility representatives to the DOE criticality safety managers' hands-on training class. This should be repeated every few years commensurate with the criticality risk in the areas the FRs support. Note: The NPO FR Qualification Standard includes elements of criticality safety appropriate to the job tasks. **(Recommendation CS.O-1)**

Best Practices:

- Given the scope and implications of the Implementation Review Action Plan, it is noteworthy that senior management initiated it, fully supports it, and is invested in its success. While such actions are expected of management, the level of engagement should be reinforced across the complex. **(Best Practice INC-5)**
- The field office criticality safety oversight procedure implements the guidance of the DOE Nuclear Criticality Safety Program, and uses the de facto NNSA standard criteria and lines of inquiry, developed from a workshop hosted by the DOE Nuclear Criticality Safety Program Manager in 1999, as the field offices self-assessment benchmark. **(Best Practice CS.O-1)**.
- Co-location of the NPO principal NCS engineer with the facility representatives (FR) for the main chemical processing facility (building 9212) contributes to enhanced oversight of both operations and criticality safety. **(Best Practice CS.O-2)**.
- The B&W criticality safety staff frequently briefs the FRs and the NPO criticality safety staff after the response to potential infractions. **(Best Practice CS.O-3)**.
- The metrics for contractor criticality safety performance are diagnostic (i.e. include leading indicators), and one of the two best in the DOE complex. The metrics are periodically changed as needed. **(Best Practice CS.O-4)**.

**Review Element #1 ASSESSMENT FORM**

<b>ELEMENT 1:</b>  <b>Operational Review Process (ORP)</b>	<b>DATE:</b> 7/22/2013 – 7/26/2013	<b>OBJECTIVE MET: YES <u>  X  </u> NO <u>    </u></b>
--	---------------------------------------	---

**Operational Review Process** – The team will conduct a comprehensive review of the processes by which NCS controls are reviewed for compliance with the applicable Criticality Safety Evaluation (CSE), as required by *Nuclear Criticality Safety Operational Review Program, Y70-68-002*.

**OBJECTIVES/CRITERIA**

*Criteria (CRADS) from ANSI/ANS-8.19-2005 and DOE-STD-1158-2010*

## Section 6: Nuclear Criticality Safety Staff Responsibilities

6.6 The staff shall conduct or participate in audits of nuclear criticality safety practices and compliance with procedures as directed by management

- Has management defined audit expectations for the NCS Staff? (e.g., audits of operations, procedures, configuration control systems, and emergency response, number, frequency, and depth of audits and walkthroughs)
- Does the NCS Staff participate in periodic audits of operations and procedures?
- Are the results of audits shared among the NCS Staff?
- Are the results of audits reported to appropriate management?
- Are corrective actions developed for deficiencies?
- Are corrective actions taken in an expeditious manner?

## Section 7: Operating Procedures

7.7 Deviations from operating procedures and unforeseen alterations in process conditions that affect nuclear criticality safety shall be reported to management, investigated promptly, corrected as appropriate, and documented. Action shall be taken to prevent recurrence.

- How are infractions graded?
- Does the nonconformance reporting system encourage discovery and reporting by operations staff rather than safety or oversight personnel?
- Are the contingencies and barriers for a given operation readily available to the NCS Staff investigating potential infractions?
- How does the NCS Staff determine the safety of immediate corrective actions for a violation condition?
- How does the NCS staff determine the remaining controls and controlled parameters when an infraction, violation, or deviation condition is discovered?

- Do procedures exist to upgrade and to properly characterize the assigned severity level of infractions due to adverse trends?
- Do procedures exist to upgrade and to properly characterize the assigned severity level of infractions due to the magnitude of the decrease in the margin of subcriticality?
- What is the required response when a potential infraction is identified? How is this communicated to operations and supervision?
- Does the NCS Staff respond to the scene of a potential infraction?
- Are the responsibilities defined for responding to a potential infraction?
- Does the NCS Staff participate in management critiques of infractions, assigning levels of infraction, and developing corrective actions?
- Are infractions resolved promptly and normal operations restarted?
- When the NCS Staff recommends immediate corrective actions to recover from an infraction, are these recommendations made in writing, peer reviewed, and approved by management?
- Are corrective actions stemming from criticality infractions entered into a tracking database and monitored until closure?
- Are minor criticality infractions tracked and trended?
- Are root causes determined where trends or patterns are identified?
- Are root causes of nonconformances determined and documented?
- When Formal Root Cause Determinations are not done how are recurrence prevention actions determined? Are approved methodologies (e.g., training, procedures, or skill-of-the craft) used?
- Are all criticality infractions, regardless of severity, properly analyzed and dispositioned?

7.8 Operations shall be reviewed frequently (at least annually) to ascertain that procedures are being followed and that process conditions have not been altered so as to affect the nuclear criticality safety evaluation. These reviews shall be conducted, in consultation with operating personnel, by individuals who are knowledgeable in nuclear criticality safety and who, to the extent practicable, are not immediately responsible for the operation.

- Are all operations reviewed at least annually?
- How do annual reviews determine that procedures are being followed?
- Do audits and reviews monitor the configuration of the facility and processes which could adversely affect criticality safety, such as movements of criticality detectors, installation of new equipment, inoperable emergency enunciators, etc.?
- Do personnel with NCS experience and knowledge of the operations participate in the reviews?
- Do the reviews examine process evaluations for criticality safety to verify that changes to the process have not compromised criticality safety?
- Are the results of the review reported to senior management as well as other appropriate management?
- Are deficiencies and proposed corrective actions documented and tracked to closure?
- Are procedures in place that verify that changes to process equipment over time have not degraded compliance with criticality safety controls?

- Does the annual review of operations verify the vertical traceability of controls from floor level documents back to the parent process evaluation for criticality safety including verification that these chains are current and maintained properly?
- Do annual reviews of operations look at all the elements of the criticality safety program affecting operations?

#### Record Review:

The following documents were reviewed:

#### Contractor Presentation:

“CSSG Assessment of Y-12 Contractor In-Brief”

##### Included Topics:

1. Nuclear Criticality Safety Program Overview
2. NCS Operational Reviews
3. Nuclear Criticality Safety Report
4. Criticality Safety Program Health
5. Nuclear Criticality Safety Action Plan

#### Requirements Documents:

- ANSI/ANS-8.1, *Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors*
- ANSI/ANS-8.19 *Administrative Practices for Nuclear Criticality Safety*
- DOE STD 1158-2010 *Self-Assessment Standard for DOE Contractor Criticality Safety Programs*
- CSSG Tasking 2013-04
- NA-00 Memorandum, *Operations-Level Line Management Oversight*
- DOE O 420.1C, *Facility Safety*

#### Procedures:

- Y70-150, *Nuclear Criticality Safety Program*, 1/28/2013
- Y70-68-002, *Nuclear Criticality Safety Operational Review Program*, 12/13/2010
- Y70-68-003, *Nuclear Criticality Safety Occurrences, Deficiencies, and Minor Noncompliances*, 7/1/2009

Technical Documents: Note that for each process review, associated process data was also collected and reviewed (e.g. Criticality Safety Approvals, Technical Deviations and Operational Review checklists).

- CSE-MCS-056, *M-Wing Machine Coolant*, Rev. 10, 11/7/2007
- CSE-IE-073, *Intermediate Evaporators System (U)*, Rev. 6, 9/14/2010
- CSE-B2E-16, *Lockbox Storage Racks (U)*
- CSE-STORSC-093, *Fissile Material Container Movement and Storage (U)*

**Management Assessments:**

- ASM-2012-0056, *Management Assessment of Compliance with Y70-163 Review Criteria 4.8, 8.4 and 8.8 Operations Reviews, Fire Protection, Large Geometry Exclusion Areas (LGEA)*
- ASM-2013-0022, *Management Assessment of Compliance with Y70-163 Review Criteria 3.6 and 3.7, NCS Staff in the Field and Auditing Compliance with Procedures & Examinations of NCS Deficiencies*

**Interviews:**

The review team interviewed the following personnel. The interviews covered the process of operational reviews, historical issues and changes in the process over time.

- Manager, Enriched Uranium Operations Criticality Safety Engineering
- Manager, Safety Analysis Engineering
- Vice President, Operations Engineering
- Criticality Safety Engineer, Enriched Uranium Operations Criticality Safety Engineering
- Deputy General Manager & Senior Vice President, Operations
- Senior Criticality Safety Officer, Operations
- Deputy Production Manager, 9204-2E Operations
- Vice President, Production

**Observations:**

This review included direct observation of three fissile material activities occurring during the completion of operational reviews and a fourth walk-down of another process. These observations are discussed further in Criterion 7.8.

The contractor provided an in-brief covering the NCS program and its health including an operational review on 7/22/2013.

**DISCUSSION OF RESULTS****Section 6: Nuclear Criticality Safety Staff Responsibilities**

6.6 The staff shall conduct or participate in audits of nuclear criticality safety practices and compliance with procedures as directed by management

This criterion is addressed through self-assessments and the operations review process, which is evaluated in more detail in Section 7.8 below. The contractor operational review process is documented in Y70-68-002, Nuclear Criticality Safety Operational Review Program (12/13/2010). Standard guidance for performing a review, including a checklist is provided in UCN-21636, NCS Operational Review of Active Process/Activity (10-12). The requirements and guidance are consistent with their associated ANSI/ANS-8-series standards. This criterion specifically requires that the NCS staff (not operations) is responsible for conducting or participating in audits.

Operations reviews are led by NCS engineers (meeting this requirement) and other review activities (e.g. implementation reviews) are coordinated by Criticality Safety Officers (CSOs) in operations organizations.

The contractor also conducts management assessments related to criticality safety per Y70-163, Management Assessments. The schedule of assessments, their scope and reports are all available on the Y-12 intranet. Each NCS management assessment is directly linked to compliance with ANSI/ANS-8-series standards. A recent management assessment (ASM-2012-0056), which included the operational review process, was reviewed as a part of this effort.

The criterion was met.

## **Section 7: Operating Procedures**

7.7 Deviations from operating procedures and unforeseen alterations in process conditions that affect nuclear criticality safety shall be reported to management, investigated promptly, corrected as appropriate, and documented. Action shall be taken to prevent recurrence.

Y70-68-003, Nuclear Criticality Safety Occurrences, Deficiencies, and Minor Noncompliances, documents the actions taken in response to NCS deviations. Deviations at Y-12 are graded into categories of Occurrences, Deficiencies, Minor Noncompliances and Field Correctables. This procedure requires creating methods to prevent recurrence for Deviations (optional for Minor Noncompliances) and requires approval from the Safety Analysis Engineering (SAE) Manager. The number of deviations and their details are documented and trended in a periodic report. "Open" Deficiencies and Minor Noncompliances are tracked through closure. The number of issues that are open for longer than 45 and 90 days are tracked as metrics to focus attention on long-standing items. These metrics have not changed significantly over the last two years.

The criterion was met.

7.8 Operations shall be reviewed frequently (at least annually) to ascertain that procedures are being followed and that process conditions have not been altered so as to affect the nuclear criticality safety evaluation. These reviews shall be conducted, in consultation with operating personnel, by individuals who are knowledgeable in nuclear criticality safety and who, to the extent practicable, are not immediately responsible for the operation.

B&W Y-12 implements a documented Operations Review process to address this requirement specifically. It is documented in Y70-68-002, *Nuclear Criticality Safety Operational Review Program* (12/13/2010). Standard guidance for performing a review, including a checklist, is provided in UCN-21636, *NCS Operational Review of Active Process/Activity* (10-12). The requirements and guidance are consistent with their associated ANSI/ANS-8-series standards.

The review team observed the field portion of three operations reviews on 7/24/13 in the first three systems listed in Table 1 below. This included observation of the processes in action. The fourth system listed, Intermediate Evaporators, was walked down the day following an operations review, and a document review was conducted for that process. The walk-downs, discussion with staff and follow up document reviews demonstrate confidence that the contractor is meeting the purpose and intent of the review criteria. However there are items of concern.

Table 1. Crosswalk between facilities and processes observed for this review.

<b>Facility</b>	<b>Evaluation</b>	<b>Process</b>
9215	CSE-MCS-056	Machining Coolant System
9204-2E	CSE-B2E-16	Lockbox Storage Racks
9720-82	CSE-STORSC-093	Fissile Material Container Movement and Storage
9212	CSE-IE-073	Intermediate Evaporators System

It was noted that the degree to which physical conditions were confirmed was subjective and varied (**Performance Problem ORP-1**). UCN-21636, which is a “checklist” guide for performing and documenting operational reviews, provides guidance to use engineering judgment as to whether to perform a 100% review for equipment and requirements. Configuration-controlled dimensions are given as an example where an engineer may not independently confirm field conditions. The contractor’s configuration management program is credited to control critical characteristics of safety related equipment, but there is no specific guidance based on the past performance of such safety management programs (SMPs) or the process in question. This review noted that configuration management of nuclear equipment has not been equally implemented in all nuclear facilities at Y-12 (**Performance Problem ORP-2**). Both of these items are identified as Performance Problems in this report.

Discussions with the contractor indicated difficulty with completing reviews by their target date. Most reviews are completed within a “grace period” or are overdue upon completion (**Performance Problem ORP-3**). Note that ANSI/ANS-8.1 § 4.1.6 and 8.19 § 7.8 require that operations be reviewed at least annually, and the contractor allows for an additional three months to complete these reviews for active processes. The contractor noted three factors that contributed to these continuing overdue reviews: 1) difficulty aligning the engineer’s schedule with irregular operations, 2) a high operation-to-engineer ratio for solutions systems and 3) the technical reviews of the Criticality Safety Evaluation associated with the process. Most of the 179 annual reviews fall on nine EUO Criticality Safety Engineering staff members who are also responsible for evaluating their processes and frequently responding to issues as they arise, which is frequently. Staff turnover, including loss to other organizations, has been identified as an issue by the contractor.

The criterion was met.

Conclusion: The Objective was met.

The contractor employs a documented system to review both operating conditions and procedures for changes that would affect the criticality safety evaluation. This system, led by a criticality safety engineer, is designed to involve stakeholders and consider modifications and issues associated with each process. While it was observed that the timeliness and consistency of these reviews presented issues, this system does fulfill its intended purpose and meets this review's criteria.

**ISSUES**

Findings:

- None

Performance Problems:

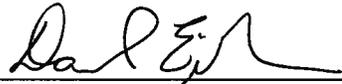
- Operations Reviews have varying degrees of rigor, depending on the NCS Engineer conducting the review. Expectations should be established for the degree of rigor to be applied. **(Performance Problem ORP-1)**
- Significant effort was applied to establishing a Configuration Management (CM) baseline and implementing NCS controls in Building 9212 during restart. It appears the level of effort applied to other facilities has not caught up to that of Building 9212. **(Performance Problem ORP-2)**
- Operations Reviews are not consistently performed on the annual frequency required per the ANS/ANSI Standards. Also, although an (acceptable) three month additional grace period is provided, in a number of cases this was not met either. **(Performance Problem ORP-3)**

Recommendations:

- None

Best Practices:

- None

<p>Element Team Members: David Erickson David Hayes Trey Kauerz</p>	<p>Approved by:  David Erickson, CSSG Team Leader</p>
---	---

**Review Element #2 ASSESSMENT FORM**

<b>ELEMENT 2:</b>  <b>Implementation of NCS Controls (INC)</b>	<b>DATE:</b> 7/22/2013 – 7/26/2013	<b>OBJECTIVE MET: YES <u> X </u> NO <u>    </u></b>
--	---------------------------------------	---

**Implementation of NCS Controls** – The team will evaluate the process of creating and executing NCS implementation plans for fissile processes. This will also include any major efforts to revise existing implementation plans such as in the *Nuclear Criticality Safety Implementation Review Action Plan*, RP-YAREA-F-0212.

**OBJECTIVES/CRITERIA**

*Criteria (CRADS) from ANSI/ANS-8.19-2005 and DOE-STD-1158-2010*

## Section 4, Management Responsibilities

4.9 Management shall establish and maintain a configuration management system that identifies and controls changes to facility and process conditions important to nuclear criticality safety

- Are facility and process conditions important to criticality safety clearly identified in safety documents? (e.g. process evaluations for criticality safety, facility design documents, authorization basis documents as needed)
- Are these conditions communicated to operational and maintenance staff?
- Is there a reliable process documented to control changes to these conditions to assure proper consideration to criticality safety is provided?
- Are facility and process conditions important to criticality safety being managed in accordance with the defined configuration management program?

## Section 5, Supervisory Responsibilities

5.5 Supervisors shall verify compliance with nuclear criticality safety specifications for new or modified equipment before its use

- What is the process for ensuring that no new or modified operation is started until all applicable verification steps have been performed, including presence of approved process evaluations for criticality safety, postings, and procedures?
- Are appropriate surveillance frequencies established for engineered controls relied upon for criticality safety to ensure that the controls are performing their intended function?
- Are transfers from favorable to unfavorable geometry appropriately analyzed and adverse effects prevented or mitigated?"

## Section 6, Nuclear Criticality Safety Staff Responsibilities

### 6.4 The staff shall maintain familiarity with all operations within the organization requiring nuclear criticality safety controls

- Does the NCS staff observe fissionable material handling and processing operations for which they provide guidance?
- Are members of the NCS Staff knowledgeable and conversant with facility operators about credible abnormal process upsets applicable to facility operations?
- Does the NCS Staff attend operations planning meetings for new or restarted processes?
- Does the NCS Staff have access to and familiarity with fissionable material operating procedures?
- Does the NCS Staff attend pre-job briefs and plan-of-the-day meetings?
- Does the NCS Staff work with cognizant systems and process engineers to understand process operations and impacts of process changes and upsets?
- Does the NCS Staff maintain familiarity with reports of deviations from expected process conditions (e.g., procedural errors, equipment failures, spills, leaks) even if these deviations do not result in a criticality infraction?

## Section 7, Operating Procedures

### 7.2 Procedures shall include those controls and limits significant to the nuclear criticality safety of the operation. Procedures should be such that no single inadvertent departure from a procedure can cause a nuclear criticality accident

- Are criticality controls that the operator can influence included in operating procedures?
- Is there a clear, unambiguous, link between criticality controls in procedures and postings and their parent process evaluation for criticality safety?
- Does the Contractor have a formalized process for determining which controls are incorporated in procedures?
- Do pre-fire plans incorporate criticality safety controls?
- Are firefighters trained and familiar with applicable criticality safety controls and practices?
- Does the NCS staff review and provide specific input to safety assessments and evaluations of other hazards that may involve criticality safety concerns?
- Are criticality related instructions in pre-fire plans and firefighting procedures practical under actual conditions of responding to fires?

### 7.4 Active procedures shall be reviewed periodically by supervision

- Has management defined periodic review criteria, including what is meant by “periodic,” for the supervisory staff?
- Are procedures periodically reviewed?
- Does the NCS Staff periodically participate in reviews of active operating procedures?
- What mechanisms are in place to ensure that all procedures are reviewed as planned?

7.5 New or revised procedures that have an impact upon nuclear criticality safety shall be reviewed by the nuclear criticality safety staff

- Do new or revised procedures that have a potential impact on criticality safety receive review by the NCS Staff? How is the determination of potential impact made?
- Does the NCS staff periodically review and/or observe operations in progress?
- Is there a mechanism for resolving conflicting comments from the NCS Staff and the other reviewers?

Record Review:

- CSE-STORSC-093, Rev. 6, *CSE for Fissile Material Container Movement and Storage (U)*
- CSE-IE-073, Rev. 6, *CSE for Intermediate Evaporators System*
- RP-YAREA-F-0212, Rev. 03/2013, *NCS Implementation Review Action Plan*
- Y/DD-1379, Rev. 1, *NCS Program Strategic Vision for the Y-12 National Security Complex*
- Y50-08-82-100 Rev. 0.17, *Special Nuclear Material Shipments and Receipts (U)*
- Y50-08-82-301 Rev. 0.12, *Metal Can Recontainerization*
- Y70-68-002 Rev. 12/13/2010, *Nuclear Criticality Safety Operational Review Program*
- Y70-150, Rev. 01/28/2013, *Nuclear Criticality Safety Program*
- NCSAC Deficiency Reports April 22 – May 26, 2013

Interviews:

- Manager, Safety Analysis Engineering
- Manager, EUO Criticality Safety Engineering
- Manager, Manufacturing Operations Criticality Safety Engineering
- Criticality Safety Engineer(s)
- Production Sr. Criticality Safety Officer
- Criticality Safety Officer, Material Management
- Criticality Safety Officer, Assembly/Quality Evaluation Production
- AM, Assembly/Quality Evaluation Production
- VP, Operations Engineering
- VP, Production
- Deputy GM and SVP, Operations

Observations:

- Walk-down of 9212 Intermediate Evaporator area
- Walk-down/Observation of Operational Review of HEUMF
- Tour of B2E processes

**DISCUSSION OF RESULTS**

Section 4, Management Responsibilities

4.9 Management shall establish and maintain a configuration management system that identifies and controls changes to facility and process conditions important to nuclear criticality safety

The Y-12 contractor management has established a system to identify/document the controls necessary to maintain the criticality safety aspects of their operations. As a part of the system, there are several elements to help maintain the alignment between the analyses and control documentation and the ongoing operations.

The current Y-12 contractor documents the necessary facility/process conditions to be maintained for criticality safety in the criticality safety evaluations (CSEs) for the processes/operations of concern. These elements are incorporated, as necessary, into the applicable safety basis documents (DSA/TSR) and are implemented via the facility procedures. Training is provided as needed to ensure operations/maintenance staff have an appropriate level of knowledge.

The Y-12 contractor performs periodic 'Operational Reviews' to ensure that each operation and its associated analysis maintain alignment. There is a formal change control process involving NCS engineers for impact on CSE/CSA/CSRs that evaluates operational changes. Operational changes are also evaluated as part of the USQ process. Based upon the outcome of the evaluations/processes the CSE/CSA/CSR is revised to maintain proper alignment.

In regards to the NCS Implementation Review Plan (RP-YAREA-F-0212), it was identified that some recent infractions indicated there could be weaknesses in the implementation of NCS Program requirements. This plan was developed to identify and address the weaknesses. Elements of the plan were identified to strengthen the CSE control implementation process, and the annual review process. Both of these elements are key to ensuring appropriate configuration management.

Based on interviews, document reviews and observations of a portion of the annual review process it was noted that the contractor has made improvements to the implementation and review process, and is still evaluating opportunities for further improvement.

During the interviews, several members of management shared expectations for follow-up actions in regards to the Implementation Action Review Plan. However, no formal, documented follow-up actions have been incorporated into the NCS Implementation Review Action Plan (RP-YAREA-F-0212) (**Performance Problem INC-1**). Several potential actions to consider for incorporation are provided in the ISSUES section, below.

One of the first facilities being addressed by the Implementation Review Action Plan is 9204-2E. A review of the container verification effort for this facility identified numerous issues that need to be resolved. The issues are being collected into a spreadsheet vs. utilizing the plant Issues Management System (IMS), or some other formalized system, to track the issues to closure. Since the spreadsheet was 'owned' by

one individual, and it was not clear if it was shared so others could access, there is concern that many of these issues could be inadvertently lost (**Performance Problem INC-2**). Due to the time it is taking to perform the verification process, and the difficulty in tracking the movement of all containers in, and out of, storage, there was no evidence provided that the container/storage verification process for Building 9204-2E has verified (or would verify) that all containers, or at least all legacy containers (those are the primary containers with indicated issues), are compliant (**Performance Problem INC-3**).

The criterion was met.

## Section 5, Supervisory Responsibilities

### 5.5 Supervisors shall verify compliance with nuclear criticality safety specifications for new or modified equipment before its use

As stated previously the Y-12 contractor uses CSEs to document the limits/controls required to maintain criticality safety. They also utilize a formal change control process and the USQ process to evaluate the impact of changes to the safety basis (DSA/TSR). The CSEs and the DSA/TSR are revised as necessary to maintain alignment with operations.

The contractor also utilizes Criticality Safety Officers (CSOs) as a primary interface with the criticality safety engineers to ensure operations have been appropriately evaluated and necessary controls implemented prior to use.

Several 9204-2E related Annual CSA/TDC Validation checklists were reviewed and demonstrated that required reviews were being performed.

It was noted during the different facility visits and interviews that Criticality Safety Officer (CSO) and NCS engineer responsibilities are not consistently implemented across facilities. Though it appeared that all specifications are reviewed, if communication between the CSO and NCS engineer is insufficient this could lead to varying levels of reviews and may not ensure all necessary criticality safety specifications have been adequately reviewed/verified (**Performance Problem INC-4**).

The criterion was met.

## Section 6, Nuclear Criticality Safety Staff Responsibilities

### 6.4 The staff shall maintain familiarity with all operations within the organization requiring nuclear criticality safety controls

The NCS staff is required to perform periodic 'operational reviews' which include a review of the applicable evaluation and procedures, a walk-down of the facility/operation and discussion with the operations staff that includes potential upsets. These operational

reviews help the staff maintain the required familiarity. A number of operational review reports were reviewed that demonstrated that the staff is performing their required duties.

The criterion was met.

## Section 7, Operating Procedures

7.2 Procedures shall include those controls and limits significant to the nuclear criticality safety of the operation. Procedures should be such that no single inadvertent departure from a procedure can cause a nuclear criticality accident

The Y-12 contractor evaluates operations and documents the required controls to maintain criticality safety in CSEs. The controls from the CSEs are implemented, as necessary, in the applicable procedures for the different operations. The Y-12 procedures include all controls that operators can monitor and/or control, and they are trailered to indicate from which CSE they originated. The same is true for postings, only indicated controls for which operator can monitor/effect, and indicate the source CSE. Since the controls in the procedures are based on the evaluations documented in the CSEs, the procedures should be supporting compliance with the DCP.

Facility fire pre-plans incorporate the applicable CSE controls. *Y/DD-708, Nuclear Criticality Safety Guidelines for Fire Fighting in Y-12 (U)* provides firefighting response based on the category of the area/process involved in the fire. The category of the area/process is determined based on sensitivity to water moderation and potential spacing changes due to firefighting methods. Areas/processes with higher hazard NCS fire categories are shown on facility specific pre-fire plans. Fire fighters receive CS training for Fissile workers as part of their qualification. Fire fighters are also trained on Y/DD-708.

The criterion was met.

7.4 Active procedures shall be reviewed periodically by supervision

The procedure's Responsible Manager/Designee performs the required periodic procedure reviews. The Responsible Manager is defined as the Manager directly responsible and accountable for the development, implementation, and function of a program or activity. Procedures with NCS requirements are on a two-year review cycle. The process is described in Y15-232, *Technical Procedure Process*.

Although one procedure was reviewed and had the required supervisor signature, there was not sufficient time during this review to investigate/verify if more of these periodic procedure reviews are being completed as required.

The criterion was met.

7.5 New or revised procedures that have an impact upon nuclear criticality safety shall be reviewed by the nuclear criticality safety staff

Y15-232, Technical Procedure Process, governs the process as to what procedure changes require NCS review. If a new, revised, intent modification, or cancellation of a technical procedure implements NCS requirements, then NCS is required to review. NCS is not required to review non-intent procedures changes as defined in Y15-232. Non-intent changes are limited to a correction of spelling or typographical errors, grammatical changes, clarifications, or additions of notes or references. Production may ask for NCS review on non-intent changes as a good practice, but it is not required.

In discussions/interviews with criticality safety engineers they indicated these reviews are being performed. One procedure was reviewed and it indicated concurrence was provided by the criticality safety engineer. However, there was not sufficient time during this review to investigate/verify if all required reviews are being completed as required.

The criterion was met.

Conclusion: The Objective was met.

While there were a few performance problems identified, the overall execution of the NCS Implementation Review Plan is working well. The contractor has defined processes to ensure configuration management of criticality safety related controls and the evaluations that support the different operations. As a part of the configuration management process, all staff are required to spend time in the field performing the 'operational reviews' to understand the current facility conditions and document that all is as expected, or to determine what needs to be done to bring the systems back into alignment. Supervision, at all levels, is very supportive of the processes that have been implemented.

As a part of the review, a Best Practice was identified related to the Implementation Review Action Plan. Considering the scope and implications of the Plan, it is noteworthy that senior management initiated it, fully supports it, and is invested in its success. While such actions are expected of management, that level of engagement should be reinforced across the complex **(Best Practice INC-5)**.

## ISSUES

### Findings:

- None

### Performance Problems:

- No formal documented follow-up actions have been incorporated into the NCS Implementation Review Action Plan (RP-YAREA-F-0212) to ensure:
  - 1) The plan accomplished expectations,

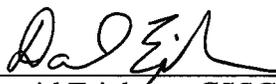
- 2) Expectations were appropriate based on actual outcome, and
- 3) The action plan has long-term effectiveness. **(Performance Problem INC-1)**
  
- The plant Issues Management System (IMS), or some other formalized system, is not being used to track all issues generated as a result of the container verification effort in Building 9204-2E. **(Performance Problem INC-2)**
  
- The container/storage verification process for Building 9204-2E does not appear to have verified that all containers, or at least all legacy containers (those with indicated issues), are compliant. **(Performance Problem INC-3)**
  
- Criticality Safety Officer (CSO) and NCS engineer responsibilities are not consistently implemented across facilities. **(Performance Problem INC-4)**  
**Recommendation:** The Implementation Action Plan includes activities to evaluate R2A2 of CSOs and NCS Engineers relative to the operations review process. Notionally, the Implementation Plan and Operational Review processes will be combined and co-performed by CSOs and NCS engineers. This should be tracked to completion as evidenced by changes to the operations review process.

Recommendations:

- None

Best Practices:

- Given the scope and implications of the Implementation Review Action Plan, it is noteworthy that senior management initiated it, fully supports it, and is invested in its success. While such actions are expected of management, the level of engagement should be reinforced across the complex. **(Best Practice INC-5)**

<p>Element Team Members:                  David Erickson                  David Hayes                  Trey Kauerz</p>	<p>Approved by:                   David Erickson, CSSG Team Leader</p>
--	--

**Review Element #3 ASSESSMENT FORM**

<b>ELEMENT 3:</b>  <b>NCS Improvement Plan (IP)</b>	<b>DATE:</b> 7/22/2013 – 7/26/2013	<b>OBJECTIVE MET: YES</b> <u>  X  </u> <b>NO</b> <u>  </u>
---	---------------------------------------	--

**NCS Improvement Plan** – The team will evaluate the effectiveness of tasks completed as part of the Nuclear Criticality Safety Program Strategic Vision for the Y-12 National Security Complex, Y/DD-1379, Rev. 1.

**OBJECTIVE**

Were the objectives of the NCS Strategic Vision (Improvement Program) met? Were the enabling objectives, as defined in the plan, achieved and did they result in an effective and efficient NCS program?

**CRITERIA**

1. Safe, Efficient, and Reliable Operations
  - Continue periodic interface meetings between YSO, DNFSB, and B&W Y-12 personnel.
  - Continue support for the Nuclear Criticality Safety Advisory Council (NCSAC) and Plant NCS Committee to foster communication and program improvements.
  - Assess the effectiveness of changes to Y70-159, *Fissile Material Activity Identification, Marking, and Requirements Posting*.
  - Update the NCS improvements “Top 10” list and pursue funding and implementation.
  - Evaluate the NCS abnormal operations procedure, and increase scope if possible.
  - Complete risk-based assessments of processes.
  - Complete Value Stream Mapping actions associated with CSE implementation.
  
2. Effective, Efficient, and Timely Deliverables and Services
  - Prepare and implement an internal NCS staff development plan.
  - Develop an annual recruiting and hiring plan for NCS staff.
  - Continue use of the SAP-based work management system and use the data to evaluate NCS CSE development cost and schedule performance.
  - Refine CSE writer’s guide and complete templates.
  - Prepare and process surveys to obtain input regarding customer satisfaction.
  - Evaluate lessons learned and the need to continue quality reviews of new CSEs.
  - Produce a separate Criticality Safety Program (CSP) document and revise Chapter 6 of the Y-12 Plant Safety Analysis Report (YSAR) to include only high-level discussions and references to the CSP. Remove duplication between the facility and plant Safety Analysis Reports.
  - Expand the use of electronic signatures to facilitate approval of NCS documents and reports.

- Evaluate placement of selected NCS engineer offices in the facility they support.
  - Evaluate the need for an evaluation and approval process tailored specifically for D&D activities.
  - Evaluate revising plant processes for technical procedure development to allow CSOs to review operating procedures (in lieu of the NCS engineer) for implementation of NCS requirements.
  - Develop an objective methodology for evaluating the release of waste/discard materials from a nuclear facility.
3. Successful Learning Organization
- Continue to use performance measures to evaluate trends, develop corrective actions as needed, and disseminate lessons learned.
  - Reevaluate and modify as necessary the NCS metric suite.
  - Assess effectiveness of completed improvement actions from Y/DD-1379, revision 0.
  - Assess the effectiveness of the NCS Management Self-Assessment program as outlined in Y70-163, *Assessments of Nuclear Criticality Safety Program Activities*.
  - Use external NCS expertise to assess Y-12 NCSP activities.
  - Assess the effectiveness of the NCS annual review process and the revised CSE input process.
  - Conduct benchmark trips to DOE sites.
4. Forward-Looking Organization
- Work with Development to generate Directed Research, Development, and Demonstration Program (PDRD) proposals that enhance NCS.
  - Improve the interchange between the operating groups and the UPF design team.
  - Implement improvements to the NCS Engineer Qualification Training program.
  - Work with B&W Business Development to pursue efforts to establish a subcritical measurement facility at Y-12.
  - Begin implementing Intermediate Evacuation Zone (IEZ) methodology documented in Y/DD-1308, *Nuclear Criticality Accident Emergency Planning Evaluation Guidance for the Y-12 National Security Complex*.
5. Organization Recognized for Excellence
- Conduct a session at the Winter American Nuclear Society (ANS) meeting, *Recent Advances in Criticality Safety Activities at the Y-12 National Security Complex*.
  - Look for opportunities for Y-12 to host visits from other sites.
  - Assess the criteria for an “Excellent” rating from YSO and implement a strategy accordingly.

Record Review:

- Y/DD-1379, Rev. 1, Nuclear Criticality Safety Program Strategic Vision for the Y-12 National Security Complex
- NCS Upgrade Review, OCT2012

- RP-YAREA-F-0212, Nuclear Criticality Safety Implementation Review Action Plan, March 2013
- Y70-68-002, Nuclear Criticality Safety Operational Review Program, December 2010
- Y70-150, Nuclear Criticality Safety Program, January 2013
- Y70-68-003, Nuclear Criticality Safety Occurrences, Deficiencies, and Minor Noncompliances, February 2011

#### Interviews:

- EUO Criticality Safety Engineering Manager
- Criticality Safety Engineers
- Safety Analysis Engineering Manager
- VP, Operations Engineering Manager
- Deputy General Manager/Senior Vice President Operations

#### Observations:

- Operational Review of Y50-01-B2-160 (9204-2E)
- Operational Review of Intermediate Evaporator (9212)

## **DISCUSSION OF RESULTS**

### **1. Safe, Efficient, and Reliable Operations**

Efforts undertaken to bolster safe, efficient, and reliable operations include:

- Weekly meetings between SAE and NPO,
- Monthly meetings between SAE-NCS and NPO NCS SME, and
- Routine meetings between CSOs and SAE-NCS staff.

Both the Nuclear Criticality Safety Advisory Committee (NCSAC) and Nuclear Criticality Safety Committee (NCSC) have been revitalized. Feedback from both committees is evident and integral to continued process improvements including the Action Plan and Strategic Plan. SAE-NCS process improvements include maintaining and updating the CSE upgrade list, including re-examining the ranking criteria to include weighting based on criticality safety risk and whether there is extensive reliance on administrative controls.

### **2. Effective, Efficient, and Timely Deliverables and Services**

A CSE Writer's guide has been developed, providing a basis for consistent CSE development. A similar guide/handbook is in development for data (consistent material densities, compositions, etc.). SAE-NCS work is being managed via a Primavera schedule. The combination of scheduling and using a consistent approach to CSE development contributes to the efficient, effective, and timely delivery of evaluations.

### **3. Successful Learning Organization**

The NCS performance metrics have been reviewed for effectiveness and a revised set is currently being evaluated. As noted in Element 5 of this assessment, the metrics are diagnostic and a Good Practice. External expertise has been solicited and employed by the SAE-NCS. In particular, the NCSC membership includes an outside expert. Program benchmarking trips included both DOE and NRC regulated facilities, resulting in improvements to the qualification program, Criticality Control Review (CCR) criteria (tied to SSC grading (objective criteria) and quality levels), and others. These feedback mechanisms combined with the responses thereto demonstrate that the SAE-NCS is a successful learning organization.

#### **4. Forward-Looking Organization**

Aspects of this criterion were not examined during this review.

#### **5. Organization Recognized for Excellence**

Professional development and interaction contributes greatly to the development and retention of people (and subsequently organizations) recognized for excellence in their field. To that end, two Technical Sessions dedicated to Y-12 NCS were held at the ANS Winter Meeting in November 2011. Efforts of this kind must be sustained to achieve and maintain organizational excellence.

#### Conclusion:

Sixty-seven action items were “completed” prior to November 2012. The remaining action item was an employee retention strategy. Discussions with HR at the VP level are ongoing relative to this topic.

Many of the enabling activities were completed. In some instances, immediate results were realized. Lessons learned during execution of these activities have resulted in continuous improvement. However, evaluation of the effectiveness and resultant efficiency improvements requires maturation before definitive conclusions can be drawn. The current review indicates that the strategies employed will result in an improved, effective, and efficient NCS program. Completion of the activities in no way obviates the need for continued evaluation (internal and external) to ensure the improved program is sustained. In fact, current efforts under the Nuclear Criticality Safety Implementation Review Action Plan have provided valuable feedback and continuous improvement to activities initiated via the Strategic Plan. Though the NCS Program Strategic Vision for the Y-12 National Security Complex (Y/DD-1379, Rev. 1) states that it “...will be reviewed and updated each year as a part of a continuous improvement process.”, there was no evidence of an update since July 2011, (**Performance Problem IP-1**). Periodic review and updating of the Strategic Plan should continue.

#### **ISSUES**

#### Findings:

- None

Performance Problems:

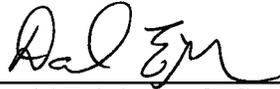
- The NCS Program Strategic Vision for the Y-12 National Security Complex (Y/DD-1379, Rev. 1) has not been updated since July 2011, although the document states that it “...will be reviewed and updated each year as a part of a continuous improvement process.” (**Performance Problem IP-1**)

Recommendations:

- None

Best Practices:

- None

<p>Element Team Members: David Erickson David Hayes Trey Kauerz</p>	<p>Approved by:  David Erickson, CSSG Team Leader</p>
---	---

**Review Element #4 ASSESSMENT FORM**

<b>ELEMENT 4:</b>  <b>NPO Oversight Process (OP)</b>	<b>DATE:</b> 7/22/2013 – 7/26/2013	<b>OBJECTIVE MET: YES <u>X</u> NO ___</b>
--	---------------------------------------	---

**NPO Oversight Process** – The team will assess how the NNSA Production Office plans and performs its oversight mission as implemented through the oversight of NCS. This is documented in procedures such as *NPO Oversight Process*, NPO-3.4.1.1.

**OBJECTIVE**

The NNSA Field Office has established and implemented effective oversight processes to ensure that the contractor has implemented, and is maintaining, an effective NCS program. The NCS oversight will be used as a vertical slice of safety oversight in general.

**CRITERIA**

1. NPO uses a systematic and effective approach to line oversight, including output from the Contractor Assurance System (CAS), to monitor and evaluate contractor performance against Y-12 mission and contract requirements. (DOE O 226.1B, Section 4)
2. The NPO employs a risk-informed, performance-based process to focus line oversight activities on contractor processes, systems and operations vital to ensuring the Y-12 mission is executed in a safe, secure, and reliable manner. (DOE O 226.1B, Sec 4)
3. A systematic approach is used by the NPO to monitor and evaluate the implementation and effectiveness of the contractor's assurance system. (DOE O 226.1B, Sec 4)
4. The NPO line oversight approach includes a structured issues management process, and corrective actions are correctly closed in a reasonable timeframe. (DOE O 226.1B, Sec 4)
5. The NPO staff is organized, and assigned personnel have adequate technical competence, to oversee the performance of the contractor's SMPs (*NNSA Functions, Responsibilities, and Authorities Manual (FRAM)*, DOE Order 5480.20A).
6. At the request of NPO management, the following was added to the assessment.
  - This assessment was effective in capturing the state of oversight at NPO
  - The expectations of NPO for self-assessment and contractor assessment are appropriate.

**Record Review:**

- NPO-P-3.4.1 Rev. 0, *NPO Oversight Processes*, February 2013
- NPO-3.1.2, Rev. 0, *NPO Oversight Planning Process*, October 2012
- NPO-3.4.1.1, Rev. 0, *NPO Oversight Process*, September 2012
- NPO- 3.4.1.1.2 Rev. 0, *Nuclear Criticality Safety Engineering Oversight*, March 2013
- NPO- 3.4.1.1.2 Attachment 2, Rev. 0, *Nuclear Criticality Safety Engineering Oversight*, March 2013

- NPO- 3.4.1.2.1 Rev. 0, NS&E Issues Evaluation and Management Process, February 2013
- NPO-2.2.3.1.4 Rev. 0, *Facility Representative Program Qualification Standard*, May 2013
- NPO-2.2.2.1 Rev. 0, *Functions, Responsibilities, and Authorities Manual*, July 2013
- Y/FSD-17 Rev. 7, Chapter 6, *Y-12 National Security Complex Safety Analysis Report*, June 2012
- Letter with Enclosure, October 31, 2012, Woolery to Erhart, *B&W Contractor Assurance System (CAS) FY12 Fourth Quarter (Q4) Report*
- Letter with Enclosure, May 6, 2013, Woolery to Erhart, *B&W Contractor Assurance System (CAS) FY13 Second Quarter (Q2) Report*
- Letter with Attachment, October 10, 2012, Spencer to Erhart, *Contract No. DE-ACO5-00OR22800, Contractor Assurance System (CAS) Performance Report*
- Letter with Attachment, January 31, 2013, Spencer to Erhart, *Contract No. DE-ACO5-00OR22800, Contractor Assurance System (CAS) Performance Report*
- Letter with Attachment, April 29, 2013, Spencer to Erhart, *Contract No. DE-ACO5-00OR22800, Contractor Assurance System (CAS) Performance Report*
- Letter with Enclosure, July 2, 2013, Erhart to Spencer & Woolery, *NPO Quarterly Issues Management Report, May 2013*
- Letter with Enclosure, March 29, 2013, Erhart to Spencer & Woolery, *NPO Quarterly Issues Management Report, February 2013*
- Letter with Enclosure, January 31, 2013, Erhart to Spencer & Woolery, *NPO Quarterly Issues Management Report, December 2012*
- Letter with Enclosure, October 31 2012, Erhart to Spencer & Woolery, *NPO Quarterly Issues Management Report, October 2012*
- Letter, March 14, 2013, Ivey to Richardson, *Contract DE-ACOS-OOOR22800, Requested Revision to Y/TSR-003, Technical Safety Requirements for the 9204-2E Facility, Regarding Audibility Administrative Controls Bases for the Criticality Accident Alarm System*
- Letter with Enclosure, November 20, 2012, Ivey to Duling, *Contract DE-ACOS-OOOR22800, Issues Related to Quality of Safety Basis Documents and Extended Review Cycles for Final Approval* ,<Note: Directed Action Vague>
- Letter, October 18, 2012, Ivey to Keith, *FINDING – Vital Safety System List Inaccuracy*
- Letter, September 27, 2012, Erhart to Spencer, *ISSUE – Extent of Condition Review*
- Memorandum for National Nuclear Security Administration Production Office, Nuclear Safety and Engineering, NPO-10, from Ivey, *Oversight and Reporting Guidance*.

#### Interviews:

- NPO Y12 Criticality Safety Staff
- NPO Deputy Assistant Manager for Nuclear Safety and Engineering
- NPO Senior Scientific Technical Advisor
- NPO Y12 Fire Protection Engineer
- NPO Y12 Facility Representatives
- NPO Y12 Team lead for Nuclear and Criticality Safety
- NPO Performance Assurance Manager
- B&W Safety Analysis Engineering Manager
- B&W Vice President, Operations Engineering

- B&W Deputy General Manager, Operations
- B&W Vice Chairman of Nuclear Criticality Safety Committee`

Observations:

- Walk-down of 9212 Evaporator area

## DISCUSSION OF RESULTS

### 1. NPO uses a systematic and effective approach to line oversight, including output from the Contractor Assurance System (CAS), to monitor and evaluate contractor performance against Y-12 mission and contract requirements. (DOE O 226.1B, Section 4)

NPO has defined a systematic oversight program in NPO-P-3.4.1, *NPO Oversight Processes*, NPO-3.4.1.1, *NPO Oversight Process*, and NPO-3.1.2, *NPO Oversight Planning Process*. The first reference is the overriding policy statement for NPO oversight, and it lays the ground-work for NPO's oversight philosophy. NPO-3.4.1.1 is the detailed oversight document that describes the elements of the oversight program required to satisfy mission objectives. These requirements include a Site Integrated Assessment Plan (SIAP), compliance and performance based assessments, metrics reviews, operational awareness activities, Contractor Assurance System, and a Quarterly Issues Management Meeting. NPO-3.1.2 provides the bases for risk-based oversight that informs the SIAP development.

The NPO Oversight Process description makes general reference to an NPO issues tracking system as the repository for records generated by oversight. However, NPO does not have a standardized system, and therefore, the various oversight records of the several NPO functions are distributed in a manner prescribed by each assistant manager. The safety oversight data are not in compatible formats, and are not readily searchable across disciplines (**Finding OP-1**). This removes an opportunity for organizational learning (DOE Guides 450.4.1c, 226.1-2). The issues and good practices found should be made available in a searchable, standardized data base system available to all the NPO safety management personnel to enhance identification of systemic or site-wide issues. (**Recommendation OP-1**).

The requirements for oversight flow down into the Criticality Safety oversight procedure NPO-3.4.1.1.2, *Nuclear Criticality Safety Engineering Oversight*. NPO-3.4.1.1.2 used the same source document for oversight criteria as did the CRAD for element 5 of this assessment, and is further discussed in that element. In the overall oversight process, NPO reviews the contractor's assurance system reports, compares them to the federal staff observations on similar areas, and drafts a quarterly report to the contractor on errors or differences in emphasis. Some improvement in the contractor performance has been observed over the last 3 quarters, partially attributable to this process (also known as the Quarterly Issues Management (QIMM) process).

The oversight approach is also guided by the NPO Functions, Responsibilities, and Authorities Manual, NPO-2.2.2.1, issued July 15, 2013 (NPO FRAM). The NPO FRAM references NA-1 SD 411.1-1C, *NNSA Safety Management Functions, Responsibilities, and Authorities Manual* (FRAM) that has been superseded by NNSA SD 450.2, *Functions, Responsibilities and Authorities (FRA) Document for Safety Management*, issued June 20, 2013. The NPO FRAM references the NNSA FRAM that was cancelled before the NPO FRAM was issued (**Performance Problem OP-2**). No substantive technical issues were noted with the NPO FRAM, but referencing a superseded foundation document is viewed as a minor performance problem.

The criterion was met.

**2. The NPO employs a risk-informed, performance-based process to focus line oversight activities on contractor processes, systems and operations vital to ensuring the Y-12 mission is executed in a safe, secure and reliable manner. (DOE O 226.1B, Sec 4)**

NPO compiles a “risk-informed” index on the contractor’s performance each year. The criteria statements focus on mission objectives, and does not explicitly include safety related programs or issues. It appears, however, that safety is included in the risk base due to perceptions of the current field office staff that safety failures or accidents will greatly impact mission risk. The safety oversight elements are selected on an annual basis based on mission risk. Even though the NPO oversight and oversight planning procedures do not explicitly consider safety risk, the emphasis appears to be on the correct risk areas, including the risks of criticality accidents and other safety risks. The team recommends that safety impacts be formally included in the risk determinations for oversight in the NPO oversight process document (**Recommendation OP-4**). It is likely that the perceived poor performance in the safety areas could have a mission impact of months to years delay. We have had no criticality accident experience in the US in the last three decades, so prediction of the public and regulatory response to an actual accident is speculative at best, but we can be certain there would be at least some impact. We have, however, had safety program and operational errors, with mission impacts lasting from a few weeks to several years.

The criterion was met.

**3. A systematic approach is used by the NPO to monitor and evaluate the implementation and effectiveness of the contractor’s assurance system. (DOE O 226.1B, Sec 4)**

The systematic monitoring and evaluation of the effectiveness of the contractor’s assurance system is documented in NPO-3.4.1.1, *NPO Oversight Process*. The execution of the procedure is demonstrated by the *NPO Quarterly Issues Management Reports*. These reports give a straightforward evaluation of the field office review of the contractor assurance reports, and comparison of those reports to direct observations by the field office staff. Where needed, these reports provide direction to the contractors to correct performance.

The criterion was met.

- 4. The NPO line oversight approach includes a structured issues management process, and corrective actions are correctly closed in a reasonable timeframe (DOE O 226.1B, Sec 4).**

The issues management requirements are captured in NPO-3.4.1.1, *NPO Oversight Process*. However, the various oversight records and issues identified by the several NPO functions are distributed in a manner prescribed by each associate manager. The safety oversight data and issues are not in compatible formats, and are not readily searchable across disciplines (**Finding OP-1**). This removes an opportunity for organizational learning (DOE Guides 450.4.1c, 226.1-2). The issues and good practices found should be made available in a searchable data base system available to all the NPO safety management personnel to enhance identification of systemic or site-wide issues.

The issues management process for Nuclear Safety and Engineering is documented in NPO-3.4.1.2.1, Rev. 0, *NS&E Issues Evaluation and Management Process*. The definitions for the various types of issues are inconsistent with the NPO guidance document on oversight. NPO-3.4.1.1, Rev. 0, *NPO Oversight Process (Performance Problem OP-3)*. This is viewed as a minor Performance Problem in that the sub tier document is inconsistent with the upper-tier document.

The criterion was met.

- 5. The NPO staff is organized, and assigned personnel have adequate technical competence, to oversee the performance of the contractor's SMPs (NNSA Functions, Responsibilities, and Authorities Manual (FRAM), DOE Order 5480.20A).**

The NPO staff includes specific SME's with subject matter assignments. Y-12 implements a technical qualification program consistent with Order 426.1. The staff is organized to provide oversight. Interviews indicated that the staffing analysis report is not well supported by task analyses and data. The staffing analysis is judged as reasonable, except for System Safety oversight staff. A new analysis is being prepared for this subject area. It is recommended that NPO consider basing the next official staffing analysis on detailed resource requirements for the work required by the safety oversight procedures, to include succession planning and input from senior safety staff (**Recommendation OP-5**).

The criterion was met.

- 6. At the request of NPO management, the following was added to the assessment.**
- **This assessment was effective in capturing the state of oversight at NPO.**
  - **The expectations of NPO for self-assessment and contractor assessment are appropriate.**

This assessment was effective at capturing the state of NPO oversight, although the breadth of the assessment of overall NPO oversight perhaps could have been greater. This CRAD contains the generic items from the CRADs used in the NNSA Biennial Reviews, but does not trigger a broad-based look at all the field office safety oversight disciplines. This review was, in effect, a vertical slice of criticality safety oversight, including the top-level oversight functions. The overall performance of oversight was analyzed in a limited fashion, but the functions of the oversight system were examined. For the size of the team and time available, a thorough review was performed. The preparation for this assessment was adversely affected by being the first of this particular type, and by multiple directions from NA-00 regarding its objectives. In particular, incorrect criticality safety CRADs and lines of inquiry were promulgated early in the planning phases. However, since the subject area was criticality safety, the criteria and lines of inquiry for the contractor program have been formally standardized since 2003 in DOE STD 1158, and CRADS and lines of inquiry from the applicable portions of that standard were actually used. For assessment of field office oversight of criticality safety, CRADS are de facto standardized across NNSA, and developed from a workshop hosted by the DOE Nuclear Criticality Safety Program Manager in 1999. The NPO field office criteria and lines of inquiry are verbatim from that document, and are flagged as a best practice in element 5 (NCS Oversight Program) of this assessment. The criticality safety assessment plan is maintained in a strategy document that is frequently updated. This strategy showed the following assessments for the year:

- Programmatic 7
- Field 16
- Checklist (mostly field) 25
- Criticality Safety Evaluation 10
- Reactive to events or discoveries 11
- External 1

The following lessons for these types of assessments were learned.

- When field office procedures are available for assessment of specific safety areas, they should be used. NPO has a thorough self-assessment procedure, with the correct CRADs, for assessing criticality safety.
- The general oversight CRAD should be expanded to promote a better understanding of field office oversight against HQ expectations.
- Review planning and team preparation should begin sooner, so the on-site portion of the review can focus on more field activities.
- Site and computer system access need a lot of advance planning. Particular on-site delays for the assessment team included:
  - Bar codes for TLDs and accountability readers (9212)
  - Computer system update delays (overnight or longer)
  - Delayed entry of completed site training into the site access systems (aka SAP).

The criterion was met.

**Conclusion:** The Objective was met.

This assessment was, in effect, a vertical slice of criticality safety oversight, including the top-level oversight functions. The overall performance of oversight was analyzed in a limited fashion, but the functions of the oversight system were examined. The overall performance was found to be adequate. It is indicated from the criteria above that all of the necessary oversight elements are occurring, but interviews from several disciplines indicated the field office needs an issues management tool that allows integration across all the oversight functions, and cross-communication between the functions. Lack of this tool is detracting from organizational learning and organizational synergy. One finding, two minor performance problems, and two recommendations were identified as part of this assessment element.

## ISSUES

### Findings:

- The safety oversight data and issues are not in compatible formats, and are not readily searchable across disciplines. **(Finding OP-1)** An issues management tool that allows integration across all the oversight functions and cross-communication between the functions should be fielded.

### Performance Problems:

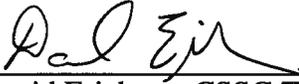
- The NPO FRAM references the NNSA FRAM that was cancelled before the NPO FRAM was issued. **(Performance Problem OP-2)**
- The definitions for the various types of issues in NPO- 3.4.1.2.1, Rev. 0, *NS&E Issues Evaluation and Management Process* are inconsistent with those in NPO-3.4.1.1, Rev. 0, *NPO Oversight Process*. **(Performance Problem OP-3)**

### Recommendations:

- Safety impacts should be formally included in the risk determinations for oversight in the NPO oversight process document. **(Recommendation OP-4)**
- It is recommended that NPO consider basing the next official staffing analysis on detailed resource requirements for the work required by the safety oversight procedures, with input from senior safety staff. **(Recommendation OP-5)**

### Best Practices:

See Review Element #5

<p>Element Team Members: Kevin Hahn Jerry Hicks Robert Wilson</p>	<p>Approved by:  David Erickson, CSSG Team Leader</p>
---	---

**Review Element #5 ASSESSMENT FORM**

<b>ELEMENT 5:</b>  <b>NCS Oversight Program (CS.O)</b>	<b>DATE:</b> 7/22/2013 – 7/26/2013	<b>OBJECTIVE MET: YES</b> <u>  X  </u> <b>NO</b> <u>    </u>
--	---------------------------------------	--

**NCS Oversight Program** – The team will assess the NPO NCS engineering oversight program that is documented in Nuclear Criticality Safety Engineering Oversight, NPO-3.4.1.1.2. This procedure governs NCS oversight at both the Y-12 NSC and the Pantex Plant.

**OBJECTIVE**

The NNSA Field Office has established and implemented effective oversight processes to ensure that the contractor has implemented, and is maintaining, an effective NCS program.

**CRITERIA**

1. The NNSA Field Office Criticality Safety Oversight Program is documented. (DOE O 226.1B; *Functions, Responsibilities, and Authorities (FRA) Document for Safety Management*, NNSA SD 450.2)
2. NNSA Field office NCS oversight activities are conducted in an orderly and systematic manner by qualified and competent NNSA personnel (DOE P 226.1B).
3. The Site Contractor has prepared and submitted a CSP description document that has been approved by the Field office Manager or designee. The CSP description document is current and consistent with the commitments in the applicable documented safety analysis (DSA) (DOE O 422.1; NA-1 SD 411.1-1C).
4. Field office procedures and mechanisms ensure that the Site Contractor has conducted periodic assessments that provide confidence that the CSP is effectively implemented in all nuclear facilities (DOE O 226.1B; NA-1 SD 226.1A; DOE O 420.1C).
5. NNSA Field office oversight ensures an effective contractor NCS program (DOE P 226.1B).
6. The NNSA Field office acquires and maintains sufficient knowledge of program activities in order to make informed decisions on criticality safety resources for these activities
7. The NNSA Field office maintains operational awareness of contractor work activities, typically through NNSA line managers and staff such as Facility Representatives and criticality safety subject matter experts.
8. The NNSA Field office reviews performance against formally established criticality safety performance measures, performance indicators, and contractor self-assessments.

9. Issues identified during previous reviews (e.g. CDNS Biennial Reviews, HSS reviews, self-assessments) have been appropriately resolved, corrective actions have been completed and are adequate, or a clear path to completion is indicated.
10. The NNSA Field office staff is organized, and assigned personnel have adequate technical competence, to oversee the performance of the contractor's NCS program (*Functions, Responsibilities, and Authorities (FRA) Document for Safety Management*, NNSA SD 450.2).

Record Review:

- NPO-3.1.2, Rev. 0, *NPO Oversight Planning Process*, October 2012
- NPO-P-3.4.1 Rev. 0, *NPO Oversight Processes*, February 2013
- NPO-3.4.1.1, Rev. 0, *NPO Oversight Process*, September 2012
- NPO- 3.4.1.1.2 Rev. 0, *Nuclear Criticality Safety Engineering Oversight*, March 2013
- NPO- 3.4.1.1.2 Attachment 2, Rev. 0, *Nuclear Criticality Safety Engineering Oversight*, March 2013
- NPO-2.2.3.1.4 Rev. 0, *Facility Representative Program Qualification Standard*, May 2013
- NPO-2.2.2.1 Rev. 0, *Functions, Responsibilities, and Authorities Manual*, July 2013
- Y/FSD-17 Rev. 7, Chapter 6, *Y-12 National Security Complex Safety Analysis Report*, June 2012
- ASM-2012-0056, ENG-NCS-MA-13-001, Management Assessment of Compliance with Y70-163 Review Criteria 4.8, 8.4, and 8.8, Operations Reviews, Fire Protection, & Large Geometry Exclusion Areas (LGEA), December 2012
- ASM-2013-0002, *Management Assessment Report, Compliance with Y70-163 Review Criteria 4.7, Deviations from Operating Procedures* (ENG-NCS-MA-13-002), April 2013
- ASM 2013 0022, ENG-NCS-MA-13-003, *Management Assessment of Compliance with Y70-163 Review Criteria 3.6 and 3.7, NCS Staff in the Field and Auditing Compliance with Procedures & Examinations of NCS Deficiencies*, June 2013
- Letter with Enclosure, January 22, 2012, Ivey to Duling, *Contract DE-ACOS-00OR22800, Continued 9204-2E Fissile Material Operations Concerns Related To Recent Nuclear Criticality Safety Infraction Events*
- Letter with Enclosure, October 31, 2012, Woolery to Erhart, *B&W Contractor Assurance System (CAS) FY12 Fourth Quarter (Q4) Report*
- Letter with Enclosure, May 6, 2013, Woolery to Erhart, *B&W Contractor Assurance System (CAS) FY13 Second Quarter (Q2) Report*
- Letter with Attachment, October 10, 2012, Spencer to Erhart, *Contract No. DE-ACO5-00OR22800, Contractor Assurance System (CAS) Performance Report*
- Letter with Attachment, January 31, 2013, Spencer to Erhart, *Contract No. DE-ACO5-00OR22800, Contractor Assurance System (CAS) Performance Report*
- Letter with Attachment, April 29, 2013, Spencer to Erhart, *Contract No. DE-ACO5-00OR22800, Contractor Assurance System (CAS) Performance Report*
- Letter with Enclosure, July 2, 2013, Erhart to Spencer & Woolery, *NPO Quarterly Issues Management Report, May 2013*

- Letter with Enclosure, March 29, 2013, Erhart to Spencer & Woolery, *NPO Quarterly Issues Management Report, February 2013*
- Letter with Enclosure, January 31, 2013, Erhart to Spencer & Woolery, *NPO Quarterly Issues Management Report, December 2012*
- Letter with Enclosure, October 31 2012, Erhart to Spencer & Woolery, *NPO Quarterly Issues Management Report, October 2012*
- Letter, March 14, 2013, Ivey to Richardson, *Contract DE-ACOS-OOOR22800, Requested Revision to Y/TSR-003, Technical Safety Requirements for the 9204-2E Facility, Regarding Audibility Administrative Controls Bases for the Criticality Accident Alarm System*
- Letter with Enclosure, November 20, 2012, Ivey to Duling, *Contract DE-ACOS-OOOR22800, Issues Related to Quality of Safety Basis Documents and Extended Review Cycles for Final Approval*, <Note: Directed Action Vague>
- Letter, October 18, 2012, Ivey to Keith, *FINDING – Vital Safety System List Inaccuracy*
- Letter, September 27, 2012, Erhart to Spencer, *ISSUE – Extent of Condition Review*
- Memorandum for National Nuclear Security Administration Production Office, Nuclear Safety and Engineering, NPO-10, from Ivey, *Oversight and Reporting Guidance*.

#### Interviews:

- NPO Y12 Criticality Safety Staff
- NPO Deputy Associate Manger for Nuclear Safety and Engineering
- NPO Y12 Fire Protection Engineer
- NPO Y12 Facility Representatives
- NPO Y12 Team lead for Nuclear and Criticality Safety
- NPO Performance Assurance Manager
- B&W Safety Analysis Engineering Manager
- B&W Vice President, Operations Engineering
- B&W Deputy General Manager, Operations
- B&W Vice Chairman of Nuclear Criticality Safety Committee

#### Observations:

- Walk-down of 9212 Evaporator area

### **DISCUSSION OF RESULTS**

- 1. The NNSA Field Office Criticality Safety Oversight Program is documented. (DOE O 226.1B; *(Functions, Responsibilities, and Authorities (FRA) Document for Safety Management, NNSA SD 450.2*).**

NPO has defined a systematic oversight program for criticality safety in NPO-3.4.1.1.2, *Nuclear Criticality Safety Engineering Oversight*. Assessment results indicate that this procedure is being executed as intended. The field office criticality safety oversight procedure implements the guidance and de facto standard criteria and lines of inquiry from the DOE Nuclear Criticality Safety Program, developed from a workshop hosted by

the DOE Nuclear Criticality Safety Program Manager in 1999, as the field offices self-assessment benchmark (**Best Practice CS.O-1**).

This criterion was met.

**2. NNSA Field office NCS oversight activities are conducted in an orderly and systematic manner by qualified and competent NNSA personnel (DOE P 226.1B).**

The FO Criticality Safety SME, responsible for Y-12, is qualified and competent. A second SME is nearing completion of his qualifications. The oversight process is substantially augmented by facility representatives (FR) who are generally familiar with criticality safety technical requirements. This was evidenced by a review of the FR qualification card, which includes criticality safety material above and beyond what is required in DOE-STD-1151-2010, *Facility Representative Functional Area Qualification Standard*. Additionally, an interview of the FR responsible for chemical processing indicated that their walk-downs of processes include a criticality safety emphasis, and issues are discussed readily with criticality safety staff.

The criterion was met.

**3. The Site Contractor has prepared and submitted a CSP description document that has been approved by the Field office Manager or designee. The CSP description document is current and consistent with the commitments in the applicable documented safety analysis (DSA) (DOE O 422.1; NA-1 SD 411.1-1C).**

The contractor submitted a Criticality Safety Program Description Document as chapter 6 of the Y/FSD-17, Rev. 7 *Y-12 National Security Complex Safety Analysis Report*. This is the site-wide Documented Safety Analysis (DSA), and approval of the DSA includes approval of the criticality safety program description. The DOE Safety Evaluation Report is the documented approval of the site DSA, and includes input from NPO senior criticality staff.

The criterion was met.

**4. Field office procedures and mechanisms ensure that the Site Contractor has conducted periodic assessments that provide confidence that the CSP is effectively implemented in all nuclear facilities (DOE O 226.1B; NA-1 SD 226.1A; DOE O 420.1C).**

Procedure NPO-3.4.1.1.2, *Nuclear Criticality Safety Engineering Oversight* specifies multiple mechanisms to assure the contractor's assessment systems provide sufficient information to assure the CSP is effectively implemented. In addition, the oversight of the contractor assurance system checks this oversight mechanism, and either verifies proper function, or directs additional actions. Quarterly assessments of subject areas from DOE-STD-1158 are reviewed, with a schedule to support review of all subject areas on a three year schedule. These assessments are provided to the field office, and the field office shadows some of these reviews. Contract direction is provided as deemed

necessary by the field office, sometimes as part of the quarterly issues management and contractor assurance overview process.

The criterion was met.

**5. NNSA Field office oversight ensures an effective contractor NCS program (DOE P 226.1B).**

NPO-3.4.1.1.2 specifies a process for an effective oversight program. The program is similar to what has been in use for several years, and its effectiveness has varied. The oversight program is currently judged to be adequate.

One issue subject to field level oversight, and identified by the contractor, is a decrease in the numbers of contractor criticality safety staff, and relatively high staff turnover. With current turnover rates, the average staff experience will decrease exponentially to an average of less than 5 years in about 5 years. B&W management is aware of the situation, and looking for causes and remedies.

The criterion was met.

**6. The NNSA Field office acquires and maintains sufficient knowledge of program activities in order to make informed decisions on criticality safety resources for these activities.**

Both the FO criticality safety SME for Y-12 and the facility representatives (FR) maintain a substantial presence in the operating areas. Both the contractor's operators and criticality safety specialists keep the FR's and the FO SME informed in a timely manner on relevant issues in the facilities. See comments on criterion 7, below.

The criterion was met.

**7. The NNSA Field office maintains operational awareness of contractor work activities, typically through NNSA line managers and staff such as Facility Representatives and criticality safety subject matter experts.**

A best practice was identified, in that the NPO principal NCS engineer is co-located with the facility representatives (FR) for the main chemical processing facility (building 9212). This contributes to enhanced oversight of both operations and criticality safety (**Best Practice CS.O-2**). Interviews with the facility representatives indicated a high level of mutual assistance between the FR staff and the NCS staff. The facility representatives indicated that more frequent formal training in nuclear criticality safety would be useful. Such training is available for travel costs only from the DOE NCSP as a one-week class for managers (recommended for facility representatives) and a two-week class for criticality safety practitioners. Registration and schedule information for these classes is available at <http://ncsp.llnl.gov/classMain.html>. Short courses are also offered by the University of New Mexico and the University of Tennessee. It is recommended

that NPO consider sending the facility representatives to the DOE criticality safety hands-on training class for managers or other appropriate training classes. This should be repeated every few years commensurate with the criticality risk in the areas the FRs support (**Recommendation CS.O-1**). This will assist the FRs in maintaining qualification and competency in the elements of criticality safety identified by the NPO FR Qualification Standard. It was judged by the assessment team that these elements of criticality safety are appropriate to the job tasks.

It was also found in interviews that the contractor NCS staff frequently briefs the FRs and NPO NCS staff regarding the situation, actions taken, and technical aspects of the situation when potential criticality safety infractions or deviations occur (**Best Practice CS.O-3**). This is recognized as a best practice.

This criterion was met.

**8. The NNSA Field office reviews performance against formally established criticality safety performance measures, performance indicators, and contractor self-assessments.**

The metrics for contractor criticality safety performance are diagnostic (i.e. include leading indicators), and judged by the reviewers as one of the two best in the DOE complex. A subset of the current metrics is listed below. The metrics are periodically changed as needed (**Best Practice CS.O-4**). This is recognized as a best practice. This set of a dozen metrics is one of the two most comprehensive in the DOE complex, and is focused on the areas of the criticality safety program of most concern to management and the B&W Y12 Criticality Safety Committee. Field office input is also considered in revising the metrics. Livermore has a similarly comprehensive set of metrics, although the metrics are different, as they should be. The B&W Y-12 metrics set is tailored to site conditions; focused on potential weaknesses; provides measureable data on improvement items; and can be used for trending and forecasting.

The B&W Y-12 metrics provided a range of data to enable both contractor and government management to critique the performance of the NCS program. Examples include:

- Time to close NCS related issues provides information on commitment to solve problems and adequacy of staffing.
- Whether NCS issues were internally identified or identified by oversight personnel provides information the contractor's safety culture
- Whether deficiencies are repeat occurrences provides information of effectiveness of corrective actions
- Categorization of "field issues" by facility, cause code, and category enables focus on specifics
- Tracking "unplanned activities" provides information on effectiveness of conduct of operations.
- Tracking "seminars" provides a measure of staff professionalism.

Tracking NCS staff time in the field provides a measure of staff understanding of operational conditions and operational support.

The criterion was met.

**9. Issues identified during previous reviews (e.g. CDNS Biennial Reviews, HSS reviews, self-assessments) have been appropriately resolved, corrective actions have been completed and are adequate, or a clear path to completion is indicated.**

The current NPO Issues tracking systems were queried for open items related to Nuclear Safety and Engineering. Some of the open items found were related to criticality safety. These were all listed as observations, not deficiencies. All Federal Deficiencies were marked as verified closed. There were several Federal Observations open, but none related to criticality safety.

When issues are identified, the NPO Criticality Safety SME reviews the Corrective Action Plan for each identified issue and tracks each action item relevant to criticality safety.

The criterion was met.

**10. The NNSA Field office staff is organized, and assigned personnel have adequate technical competence, to oversee the performance of the contractor's NCS program (*Functions, Responsibilities, and Authorities (FRA) Document for Safety Management, NNSA SD 450.2*).**

The Senior Nuclear Criticality Safety (NCS) SME has technical competence to oversee the contractor's criticality safety program, as documented by TQP qualification completion. Further, several members of this and former assessment teams have documented the Senior NCS SME's competence over the years. A junior NCS SME is nearing completion of his qualification. His qualification oral board was chaired by a member of this assessment team, and it was the consensus judgment of the board that this junior engineer will be able to contribute significantly to NNSA criticality safety oversight.

There was fundamental and valid disagreement among the team about whether the current Field Office staffing is adequate. With such a dichotomy, a solid recommendation to increase staff immediately cannot be made. However, the team was in full agreement that more staff will be needed in the near future. The senior NPO criticality SME is eligible for retirement. There is a possibility that the junior NPO criticality safety SME could discover more attractive job opportunities in the next few years. To maintain continuity, NPO should consider bringing additional NCS staff on board soon. Given that initial qualification in criticality safety takes over a year, even for experienced personnel from other disciplines, a 2-year horizon may be too long to support continuity. A recommendation is placed in element 4 of this assessment that the

next staffing analyses have a task and resource requirement basis with consideration for succession planning.

The current NPO staffing plan (February, 2013) calls for 2.25 FTEs. The workload was exacerbated with the recent loss of subcontractor SME support due to budget constraints. The NCS support is now one SME plus a federal staff trainee who is near completion of his qualifications. The areas identified by NPO staff where NCS oversight may be insufficient include:

- Review of contractor criticality safety evaluations
- Review of Authorization Bases impact
- Administrative support to NPO processes
- Emergent issue responses
- Support of criticality safety when conflict with other mission priorities arises.

It is noted that the Savannah River Field Element has four Criticality Safety federal staff to monitor the contractor's performance. LANL, the NNSA site with similar complexity to Y-12, has one Criticality Safety Federal staff, and one in training.

The criterion was met.

Conclusion: The Objective was met.

The documented NCS oversight program meets all expectations. Implementation appears to be effective, but would be less effective without the contractor's stated objective, and apparent effort toward being excellent rather than compliant. NPO should continue its efforts to foster a collaborative relationship with the contractor NCS organization, in accordance with standard DEAR contract requirements for the contractor. The level of NPO staffing for the oversight of criticality safety deserves additional review.

## **ISSUES**

### Findings & Performance Problems:

- None

### Recommendations:

- NPO should consider sending the facility representatives to the DOE criticality safety managers' hands-on training class. This should be repeated every few years commensurate with the criticality risk in the areas the FRs support. Note: The NPO FR Qualification Standard includes elements of criticality safety appropriate to the job tasks. **(Recommendation CS.O-1)**

Best Practices:

- The field office criticality safety oversight procedure implements the guidance of the DOE Nuclear Criticality Safety Program, and uses the de facto NNSA standard criteria and lines of inquiry, developed from a workshop hosted by the DOE Nuclear Criticality Safety Program Manager in 1999, as the field offices self-assessment benchmark. **(Best Practice CS.O-1)**
- Co-location of the NPO principal NCS engineer with the facility representatives (FR) for the main chemical processing facility (building 9212) contributes to enhanced oversight of both operations and criticality safety. **(Best Practice CS.O-2)**
- The B&W criticality safety staff frequently briefs the FRs and the NPO criticality safety staff after the response to potential infractions. **(Best Practice CS.O-3)**
- The metrics for contractor criticality safety performance are diagnostic (i.e. include leading indicators), and one of the two best in the DOE complex. The metrics are periodically changed as needed. **(Best Practice CS.O-4)**

Element Team Members: Kevin Hahn Jerry Hicks Robert Wilson	Approved by:  David Erickson, CSSG Team Leader
---	--

**Attachment 1**  
**Copy of Approved CSSG Tasking 2013-04**

## **CSSG TASKING 2013-04**

Date Issued: June 25, 2013

### **Task Title: *CSSG Assessment of Y-12 NCS Operational Review and Evaluation Implementation Process***

#### **Task Statement:**

The CSSG is directed to support a NPO assessment of the current state of the Y-12 NCS Operational Review Process (e.g., ANSI/ANS-8.19-2005 §7.7 and 7.8 or other appropriate sections) and identify recommended improvements to reduce infraction events, the contractor's process for implementing evaluations, and the initiatives the NCS program is focusing on per the NCS Improvement Plan to ensure they are the most pressing.

The CSSG shall provide assessment results/findings/recommendations for use by NA-00-NPO-10 to ensure the contractor is building/maintaining a compliant NCS program.

This assessment shall also include a review of the NA-00-NPO-10 line oversight program and its capability to continue to ensure these elements of the contractor's criticality safety program provide the function intended by the Standards to preclude a criticality accident and prevent recurrence of infractions.

The conduct of the review will be according to protocols and procedures established by NA-00-NPO-10. Lines of inquiry and specific review topics shall be jointly developed by the team. The DOE NCSP Manager shall concur on the review plan and the assigned NA-00-NPO manager shall approve the review plan.

#### **Period of Performance:**

The on-site assessment and review is scheduled for the week of July 22, 2013. The team will perform reviews as available prior to the onsite portion of the assessment and report writing after. An outbrief with draft results will be provided to NA-00-NPO-10 management prior to site departure (July 26, 2013).

#### **Resources:**

The Team Leader will be the NA-00-NPO-10 Assistant Manager for Nuclear Safety and Engineering.

Contractor CSSG members of the team will use their FY13 NCSP CSSG support funding as appropriate; DOE CSSG members of the team will utilize support from their site offices.

CSSG Tasking 2013-04 Review Team Members:

- David Erickson (SRNS, CSSG Team Lead)

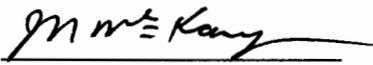
- Bob Wilson (DOE-EM)
- David Hayes (LANL)
- Jerry Hicks (NA-SH Representative)
- Ken Ivey, Team Leader, NA-00-NPO-10
- Trey Kauerz, Deputy Team Leader, NA-00-NPO-10

The assessment team will visit the Oak Ridge Y-12 site and conduct reviews, interviews and walkdowns as necessary to understand the state of the contractor NCS program and effectiveness of their assessment and evaluation implementation programs. When a draft is ready for review, the entire CSSG will be provided an opportunity to review the draft and provide comments to the CSSG Team Lead, who will address/resolve the comments and forward the resulting response to CSSG Chair for transmittal to the NCSP Manager.

**Task Deliverables:**

1. CSSG Subgroup on-site July 22, 2013
2. CSSG Subgroup in-brief with NA-00-NPO management
3. CSSG Subgroup exit briefing to NA-00-NPO July 26, 2013
4. CSSG subgroup draft report and provide to CSSG for comments by August 15, 2013
5. CSSG to provide comments on the draft response to the CSSG Team Lead by August 22, 2013
6. CSSG Subgroup Team Lead to consolidate/resolve comments and provide revised draft to the CSSG for concurrence, and NA-00-NPO-10 for factual accuracy review, by August 30, 2013
7. Y-12 to provide factual accuracy comments by September 16, 2013
8. CSSG provides concurrence by September 19, 2013
9. CSSG Chair transmits the CSSG response to NCSP Manager by September 25, 2013
10. The NCSP Manager transmits the approved CSSG report to NA-00-NPO by September 30, 2013

**Task Due Date: September 30, 2013**

Signed:  6/25/13  
**Jerry N. McKamy, Manager US DOE NCSP**

**Attachment 2**  
**Copy of Approved Operations-Level Review Plan**

**Office of Infrastructure and Operations (NA-00)  
Operations-Level Review Plan**

<b>Site/Location:</b> Y-12 National Security Complex	<b>Review Team Members:</b> Trey Kauerz, NPO-10, Deputy Team Lead David Erikson, SRNS, CSSG Team Lead Bob Wilson, DOE-EM David Hayes, LANL Jerry Hicks, NA-SH Kevin Hahn, NA-SH Roger Liddle, NA-00 (Observer)
<b>Review Team Lead:</b> Ken Ivey, NA-00-NPO-10	
<b>Review Period:</b> July 22, 2013 through July 26, 2013	
<b>Functional Areas:</b> Nuclear Criticality Safety Line Management Oversight	<b>Sub-Functional Areas:</b> Operational Reviews Controls Implementation Improvement Plan Federal oversight
<b>Purpose:</b>  The purpose of this review is to conduct an NNSA Office of Infrastructure and Operations (NA-00) Operations-Level Oversight Performance Review of Nuclear Criticality Safety (NCS) at the Y-12 National Security Complex (Y-12). This review plan was developed in accordance with the June 30, 2013, memorandum from James J. McConnell, Acting Associate Administrator for Infrastructure and Operations, to Distribution, "Subject: Operations-Level Line Management Oversight." The review team will evaluate selected elements of the Y-12 NCS program based on a request from the NNSA Production Office (NPO), including the operational review process; implementation of criticality safety evaluation (CSE) controls; and the effectiveness of the NCS improvement plan (Y/DD-1379, <i>Nuclear Criticality Safety Program Strategic Vision for the Y-12 National Security Complex</i> , dated July 2011). The NCS review criteria were based on the criteria in DOE-STD-1158, <i>Self-Assessment Standard for DOE Contractor Criticality Safety Programs</i> . The team will also evaluate the established NPO oversight processes through the evaluation of their oversight of the Y-12 NCS program.  This review is performed for and the results will be provided to the NPO Manager. The NPO Manager will take any actions necessary based on the issues identified during the review.	

## Office of Infrastructure and Operations (NA-00) Operations-Level Review Plan

### Scope:

The scope of this review includes the following elements:

1. **The Operational Review Process.** Comprehensive review of the processes by which NCS controls are reviewed for compliance with the applicable Criticality Safety Evaluation (CSE), as required by *Nuclear Criticality Safety Operational Review Program*, Y70-68-002.
2. **Implementation of NCS Controls.** This covers the process of creating and executing NCS implementation plans for fissile processes. This will also include any major efforts to revise existing implementation plans such as in the *Nuclear Criticality Safety Implementation Review Action Plan*, RP-YAREA-F-0212.
3. **NCS Improvement Plan.** The team will evaluate the effectiveness of tasks completed as part of the *Nuclear Criticality Safety Program Strategic Vision for the Y-12 National Security Complex*, Y/DD-1379, Rev 1.
4. **NPO Oversight Process.** The team will assess how the NNSA Production Office plans and performs its oversight mission as implemented through the oversight of NCS. This is documented in procedures such as *NPO Oversight Process*, NPO-3.4.1.1.
5. **NCS Oversight Program.** The team will assess the NPO NCS engineering oversight program which is documented in *Nuclear Criticality Safety Engineering Oversight*, NPO-3.4.1.1.2. This procedure governs NCS oversight at both the Y-12 NSC and the Pantex Plant.

This activity will not only assess compliance with requirements, but find opportunities for improvement and strengths to share with the enterprise.

**Office of Infrastructure and Operations (NA-00)**  
**Operations-Level Review Plan**

**Methodology:**

This review will involve interviews and briefings with NCS and operations staff, document reviews, and observation of fissile material operations. This will include the observation of at least two operations reviews in the field. The team will use the ANSI/ANS 8 Standards, DOE Orders (e.g. 420.1C and 226.1B) and plant procedures for guidance.

Team members are assigned to the following scope:

**Nuclear Criticality Safety (Elements 1 – 3)**

Trey Kauerz  
David Erikson  
David Hayes

**Federal oversight (Elements 4 and 5)**

Jerry Hicks  
Bob Wilson  
Kevin Hahn

Each sub team will use the Criteria, Review and Approach Documents (CRADs) below to assess their respective elements. NPO will provide office space, computer access, and meetings rooms to accommodate the team. The contractor will coordinate meetings with their staff and facility walk downs, and provide documents and information as requested.

The team will conduct an in-briefing with NPO and contractor senior management on 7/22/13 and an out-briefing on 7/26/13. Daily briefings will be conducted by the team leader with site senior management to provide any identified issues.

Findings, Performance Problems and Recommendations resulting from this review will be provided to the NA-00- NPO Manager in a formal assessment report. The issues will be identified and resolved in accordance with the NPO issues management process defined in NPO-3.4.1.1, *NPO Oversight Process*.

Lessons learned and best practices identified with this review process and as a result of the federal oversight elements of this review will be shared with NA-00 to enhance enterprise-wide knowledge.

## **Scope Element 1: The Operational Review Process**

*Criteria (CRADS) from ANSI/ANS-8.19-2005 and DOE-STD-1158-2010*

### Section 6: Nuclear Criticality Safety Staff Responsibilities

6.6 The staff shall conduct or participate in audits of nuclear criticality safety practices and compliance with procedures as directed by management

- Has management defined audit expectations for the NCS Staff? (e.g., audits of operations, procedures, configuration control systems, and emergency response, number, frequency, and depth of audits and walkthroughs)
- Does the NCS Staff participate in periodic audits of operations and procedures?
- Are the results of audits shared among the NCS Staff?
- Are the results of audits reported to appropriate management?
- Are corrective actions developed for deficiencies?
- Are corrective actions taken in an expeditious manner?

### Section 7: Operating Procedures

7.7 Deviations from operating procedures and unforeseen alterations in process conditions that affect nuclear criticality safety shall be reported to management, investigated promptly, corrected as appropriate, and documented. Action shall be taken to prevent recurrence.

- How are infractions graded?
- Does the nonconformance reporting system encourage discovery and reporting by operations staff rather than safety or oversight personnel?
- Are the contingencies and barriers for a given operation readily available to the NCS Staff investigating potential infractions?
- How does the NCS Staff determine the safety of immediate corrective actions for a violation condition?
- How does the NCS staff determine the remaining controls and controlled parameters when an infraction, violation, or deviation condition is discovered?
- Do procedures exist to upgrade and to properly characterize the assigned severity level of infractions due to adverse trends?
- Do procedures exist to upgrade and to properly characterize the assigned severity level of infractions due to the magnitude of the decrease in the margin of subcriticality?
- What is the required response when a potential infraction is identified? How is this communicated to operations and supervision?
- Does the NCS Staff respond to the scene of a potential infraction?
- Are the responsibilities defined for responding to a potential infraction?
- Does the NCS Staff participate in management critiques of infractions, assigning levels of infraction, and developing corrective actions?
- Are infractions resolved promptly and normal operations restarted?

- When the NCS Staff recommends immediate corrective actions to recover from an infraction, are these recommendations made in writing, peer reviewed, and approved by management?
- Are corrective actions stemming from criticality infractions entered into a tracking database and monitored until closure?
- Are minor criticality infractions tracked and trended?
- Are root causes determined where trends or patterns are identified?
- Are root causes of nonconformances determined and documented?
- When Formal Root Cause Determinations are not done how are recurrence prevention actions determined? Are approved methodologies (e.g., training, procedures, or skill-of-the craft) used?
- Are all criticality infractions, regardless of severity, properly analyzed and dispositioned?

7.8 Operations shall be reviewed frequently (at least annually) to ascertain that procedures are being followed and that process conditions have not been altered so as to affect the nuclear criticality safety evaluation. These reviews shall be conducted, in consultation with operating personnel, b individuals who are knowledgeable in nuclear criticality safety and who, to the extent practicable, are not immediately responsible for the operation.

- Are all operations reviewed at least annually?
- How do annual reviews determine that procedures are being followed?
- Do audits and reviews monitor the configuration of the facility and processes which could adversely affect criticality safety, such as movements of criticality detectors, installation of new equipment, inoperable emergency enunciators, etc.?
- Do personnel with NCS experience and knowledge of the operations participate in the reviews?
- Do the reviews examine process evaluations for criticality safety to verify that changes to the process have not compromised criticality safety?
- Are the results of the review reported to senior management as well as other appropriate management?
- Are deficiencies and proposed corrective actions documented and tracked to closure?
- Are procedures in place that verify that changes to process equipment over time have not degraded compliance with criticality safety controls?
- Does the annual review of operations verify the vertical traceability of controls from floor level documents back to the parent process evaluation for criticality safety including verification that these chains are current and maintained properly?
- Do annual reviews of operations look at all the elements of the criticality safety program affecting operations?

**Scope Element 2: Implementation of NCS Controls**

*Criteria (CRADS) from ANSI/ANS-8.19-2005 and DOE-STD-1158-2010*

Section 4, Management Responsibilities

4.9 Management shall establish and maintain a configuration management system that identifies and controls changes to facility and process conditions important to nuclear criticality safety

- Are facility and process conditions important to criticality safety clearly identified in safety documents? (e.g. process evaluations for criticality safety, facility design documents, authorization basis documents as needed)
- Are these conditions communicated to operational and maintenance staff?
- Is there a reliable process documented to control changes to these conditions to assure proper consideration to criticality safety is provided?
- Are facility and process conditions important to criticality safety being managed in accordance with the defined configuration management program?

## Section 5, Supervisory Responsibilities

5.5 Supervisors shall verify compliance with nuclear criticality safety specifications for new or modified equipment before its use

- What is the process for ensuring that no new or modified operation is started until all applicable verification steps have been performed, including presence of approved process evaluations for criticality safety, postings, and procedures?
- Are appropriate surveillance frequencies established for engineered controls relied upon for criticality safety to ensure that the controls are performing their intended function?
- Are transfers from favorable to unfavorable geometry appropriately analyzed and adverse effects prevented or mitigated?"

## Section 6, Nuclear Criticality Safety Staff Responsibilities

6.4 The staff shall maintain familiarity with all operations within the organization requiring nuclear criticality safety controls

- Does the NCS staff observe fissionable material handling and processing operations for which they provide guidance?
- Are members of the NCS Staff knowledgeable and conversant with facility operators about credible abnormal process upsets applicable to facility operations?
- Does the NCS Staff attend operations planning meetings for new or restarted processes?
- Does the NCS Staff have access to and familiarity with fissionable material operating procedures?
- Does the NCS Staff attend pre-job briefs and plan-of-the-day meetings?
- Does the NCS Staff work with cognizant systems and process engineers to understand process operations and impacts of process changes and upsets?
- Does the NCS Staff maintain familiarity with reports of deviations from expected process conditions (e.g., procedural errors, equipment failures, spills, leaks) even if these deviations do not result in a criticality infraction?

## Section 7, Operating Procedures

7.2 Procedures shall include those controls and limits significant to the nuclear criticality safety of the operation. Procedures should be such that no single inadvertent departure from a procedure can cause a nuclear criticality accident

- Are criticality controls that the operator can influence included in operating procedures?
- Is there a clear, unambiguous, link between criticality controls in procedures and postings and their parent process evaluation for criticality safety?
- Does the Contractor have a formalized process for determining which controls are incorporated in procedures?
- Do pre-fire plans incorporate criticality safety controls?
- Are firefighters trained and familiar with applicable criticality safety controls and practices?
- Does the NCS staff review and provide specific input to safety assessments and evaluations of other hazards that may involve criticality safety concerns?
- Are criticality related instructions in pre-fire plans and firefighting procedures practical under actual conditions of responding to fires?

7.4 Active procedures shall be reviewed periodically by supervision

- Has management defined periodic review criteria, including what is meant by “periodic,” for the supervisory staff?
- Are procedures periodically reviewed?
- Does the NCS Staff periodically participate in reviews of active operating procedures?
- What mechanisms are in place to ensure that all procedures are reviewed as planned?

7.5 New or revised procedures that have an impact upon nuclear criticality safety shall be reviewed by the nuclear criticality safety staff

- Do new or revised procedures that have a potential impact on criticality safety receive review by the NCS Staff? How is the determination of potential impact made?
- Does the NCS staff periodically review and/or observe operations in progress?
- Is there a mechanism for resolving conflicting comments from the NCS Staff and the other reviewers?

**Scope Element 3: NCS Improvement Plan**

CRAD: Were the following objectives of the NCS Strategic Vision (Improvement Program) met? Were the enabling objectives, as defined in the plan, achieved and did they result in an effective and efficient NCS program?

**CRITERIA**

1. Safe, Efficient, and Reliable Operations

- Continue periodic interface meetings between YSO, DNFSB, and B&W Y-12 personnel.
- Continue support for the Nuclear Criticality Safety Advisory Council (NCSAC) and Plant NCS Committee to foster communication and program improvements.
- Assess the effectiveness of changes to Y70-159, *Fissile Material Activity Identification, Marking, and Requirements Posting*.

- Update the NCS improvements “Top 10” list and pursue funding and implementation.
  - Evaluate the NCS abnormal operations procedure, and increase scope if possible.
  - Complete risk-based assessments of processes.
  - Complete Value Stream Mapping actions associated with CSE implementation.
2. Effective, Efficient, and Timely Deliverables and Services
- Prepare and implement an internal NCS staff development plan.
  - Develop an annual recruiting and hiring plan for NCS staff.
  - Continue use of the SAP-based work management system and use the data to evaluate NCS CSE development cost and schedule performance.
  - Refine CSE writer’s guide and complete templates.
  - Prepare and process surveys to obtain input regarding customer satisfaction.
  - Evaluate lessons learned and the need to continue quality reviews of new CSEs.
  - Produce a separate Criticality Safety Program (CSP) document and revise Chapter 6 of the Y-12 Plant Safety Analysis Report (YSAR) to include only high-level discussions and references to the CSP. Remove duplication between the facility and plant Safety Analysis Reports.
  - Expand the use of electronic signatures to facilitate approval of NCS documents and reports.
  - Evaluate placement of selected NCS engineer offices in the facility they support.
  - Evaluate the need for an evaluation and approval process tailored specifically for D&D activities.
  - Evaluate revising plant processes for technical procedure development to allow CSOs to review operating procedures (in lieu of the NCS engineer) for implementation of NCS requirements.
  - Develop an objective methodology for evaluating the release of waste/discard materials from a nuclear facility.
3. Successful Learning Organization
- Continue to use performance measures to evaluate trends, develop corrective actions as needed, and disseminate lessons learned.
  - Reevaluate and modify as necessary the NCS metric suite.
  - Assess effectiveness of completed improvement actions from Y/DD-1379, revision 0.
  - Assess the effectiveness of the NCS Management Self-Assessment program as outlined in Y70-163, *Assessments of Nuclear Criticality Safety Program Activities*.
  - Use external NCS expertise to assess Y-12 NCSP activities.
  - Assess the effectiveness of the NCS annual review process and the revised CSE input process.
  - Conduct benchmark trips to DOE sites.
4. Forward-Looking Organization
- Work with Development to generate Directed Research, Development, and Demonstration Program (PDRD) proposals that enhance NCS.
  - Improve the interchange between the operating groups and the UPF design team.
  - Implement improvements to the NCS Engineer Qualification Training program.

- Work with B&W Business Development to pursue efforts to establish a subcritical measurement facility at Y-12.
- Begin implementing Intermediate Evacuation Zone (IEZ) methodology documented in Y/DD-1308, *Nuclear Criticality Accident Emergency Planning Evaluation Guidance for the Y-12 National Security Complex*.

5. Organization Recognized for Excellence

- Conduct a session at the Winter American Nuclear Society (ANS) meeting, *Recent Advances in Criticality Safety Activities at the Y-12 National Security Complex*.
- Look for opportunities for Y-12 to host visits from other sites.
- Assess the criteria for an “Excellent” rating from YSO and implement a strategy accordingly.

**Scope Element 4: NPO Oversight Process**

CRAD: NPO has established and implemented effective oversight processes to ensure that the contractor has implemented, and is maintaining, effective safety management programs (SMP).

CRITERIA

1. NPO uses a systematic and effective approach to line oversight, including output from the CAS, to monitor and evaluate contractor performance against Y-12 mission and contract requirements. (DOE O 226.1B, Section 4)
2. The NPO employs a risk-informed, performance based process to focus line oversight activities on contractor processes, systems and operations vital to ensuring the Y-12 mission is executed in a safe, secure and reliable manner. (DOE O 226.1B, Sec 4)
3. A systematic approach is used by the NPO to monitor and evaluate the implementation and effectiveness of the contractor’s assurance system. (DOE O 226.1B, Sec 4)
4. The NPO line oversight approach includes a structured issues management process, and corrective actions are correctly closed in a reasonable timeframe. (DOE O 226.1B, Sec 4)
5. The NPO staff is organized, and assigned personnel have adequate technical competence, to oversee the performance of the contractor’s SMPs (*NNSA Functions, Responsibilities, and Authorities Manual* (FRAM), DOE Order 5480.20A).

**Scope Element 5: NCS Oversight Program**

CRAD: The NNSA Field Office has established and implemented effective oversight processes to ensure that the contractor has implemented, and is maintaining, an effective NCS program.

## CRITERIA

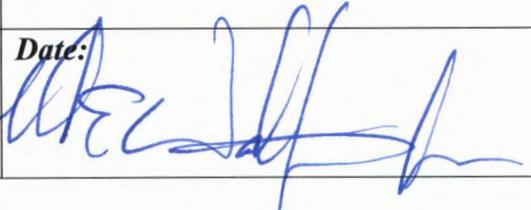
1. The NNSA Field Office Criticality Safety Oversight Program is documented. (DOE O 226.1B; *Functions, Responsibilities, and Authorities (FRA) Document for Safety Management*, NNSA SD 450.2)
2. NNSA Field office NCS oversight activities are conducted in an orderly and systematic manner by qualified and competent NNSA personnel (DOE P 226.1B).
3. The Site Contractor has prepared and submitted a CSP description document that has been approved by the Field office Manager or designee. The CSP description document is current and consistent with the commitments in the applicable documented safety analysis (DSA) (DOE O 422.1; NA-1 SD 411.1-1C).
4. Field office procedures and mechanisms ensure that the Site Contractor has conducted periodic assessments that provide confidence that the CSP is effectively implemented in all nuclear facilities (DOE O 226.1B; NA-1 SD 226.1A; DOE O 420.1C).
5. NNSA Field office oversight ensures an effective contractor NCS program (DOE P 226.1B).
6. The NNSA Field office acquires and maintains sufficient knowledge of program activities in order to make informed decisions on criticality safety resources for these activities
7. The NNSA Field office maintains operational awareness of contractor work activities, typically through NNSA line managers and staff such as Facility Representatives and criticality safety subject matter experts.
8. The NNSA Field office reviews performance against formally established criticality safety performance measures, performance indicators, and contractor self-assessments.
9. Issues identified during previous reviews (e.g. CDNS Biennial Reviews, HSS reviews, self-assessments) have been appropriately resolved, corrective actions have been completed and are adequate, or a clear path to completion is indicated.
10. The NNSA Field office staff is organized, and assigned personnel have adequate technical competence, to oversee the performance of the contractor's NCS program (*Functions, Responsibilities, and Authorities (FRA) Document for Safety Management*, NNSA SD 450.2).

**Data Call**

The following must be made available to the review team by the start of the review:

- Nuclear Criticality Safety documentation related to each of the two processes that are part of this review:
  - Criticality Safety Evaluations (CSE)
  - Criticality Safety Approvals or Requirements (CSA/CSR)
  - Operating Procedures
  - Implementations plan
  - Records associated with operations reviews including design drawings
  - Plant and organization-level procedures related to operations reviews and implementation plans
- Documentation, plans and progress reports related to the NCS Improvement Plan and related activities
- The contractor is requested to brief the team on the three NCS scope elements (operations reviews, implementation, and improvement activities) on Monday, July 22, 2013.
- The NPO Performance Assurance Manager is requested to brief the team on the NPO oversight planning and performance process
- The NPO Nuclear Criticality Safety Point of Contact is requested to brief the team on NPO NCS oversight activities, including recent changes as a result of the stand-up of NPO.

Additional documents and/or information may be requested during the review including briefings and interviews as necessary.

<p><b>Prepared By:</b> Ken Ivey, Team Leader NA-00-NPO-10, Assistant Manager for Nuclear Safety &amp; Engineering</p>	<p><i>Date:</i>  7/16/13</p>
<p><b>Approved By:</b> Dr. Jerry McKamy NA-00-10, Director, Environment, Safety &amp; Health</p>	<p><i>Date:</i> <i>Signature on File</i> July 17, 2013</p>
<p><b>Approved By:</b> Steven Erhart NA-00-NPO, NPO Manager</p>	<p><i>Date:</i> </p>