

Westinghouse Non-Proprietary Class 3

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Safety System Functional Assessment (SSFA)

Generic Assessment Plan

CEOG Resource Sharing Subcommittee Task 2031



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Westinghouse Proprietary Class 3

WCAP-15956-NP, Revision 0

**SAFETY SYSTEM FUNCTIONAL ASSESSMENT (SSFA)
GENERIC ASSESSMENT PLAN**

CEOG Task 2031

October 2002

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**Westinghouse Electric Company LLC
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CEOG SSFA GENERIC ASSESSMENT PLAN

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CEOG SSFA GENERIC ASSESSMENT PLAN

1. Introduction

The CEOG Executive Committee created an engineering resource sharing initiative for the primary purpose of, but not limited to, performing safety system functional assessments (SSFA). These SSFAs will be performed on various safety related systems at CEOG participant PWR plants. These SSFAs will be performed in part by peer engineering personnel from the various CEOG member utilities' PWR design plants. The use of peer engineering personnel will strengthen independence of assessment, promote the use of operating experience specific to Westinghouse-CE design plants and enhance the overall technical knowledge and skills of the assessment team members. The SSFA teams will benefit both technically and economically from peer resources whose knowledge and skills are based on very similar plant design. Westinghouse will work directly with the host utility SSFA manager to provide management assistance during the SSFA. Westinghouse oversight is intended to enforce consistency and rigor across the SSFA program. Westinghouse will be directly involved in the conduct of the SSFAs. Additionally, Westinghouse will support the utility participants at NRC interface meetings. This document revision has been developed to incorporate lessons learned from previous SSFA activities and the inspection focus in the NRC Revised Oversight Process (ROP).

SSFA Purpose

The purpose of an SSFA is to validate that a risk significant system in a nuclear power plant has been designed and maintained in a manner to ensure reliable operation in normal, abnormal, and/or emergency conditions and can perform its intended safety function. The host utility may use this process to assess the design and operational capability of non-risk significant systems. As plants age, their design bases may be lost and an important design feature may be altered or disabled during a modification. The plant risk assessment model assumes capability of safety systems to perform its intended safety function successfully. The purpose of an SSFA is to verify aspects of the NRC ROP Mitigating Systems and Barrier Integrity cornerstones for which there are no indicators to measure performance.

In a broad sense, the SSFA is conducted on a selective basis to perform an in-depth review of design related activities, testing, operations, maintenance and corrective actions of safety

systems. The SSFA will address regulatory compliance, good practices and peer information.

SSFAs are a proactive approach that will self-identify problems and provide for continual assessment of the overall health of plant equipment, systems and programs and are part of the utility's self-assessment program. The SSFAs will identify system and process related problems. Observations will be documented and addressed in accordance with the host utility's site specific Corrective Actions Program. The SSFA report will document the observations of the assessment. The SSFAs are intended to be performed rigorously and thoroughly while focusing on nuclear safety and plant reliability and availability. SSFAs will reveal potential vulnerabilities within plant systems and programs.

Generic Assessment Plan Purpose

The purpose of this Generic Assessment Plan (GAP) is to provide generic guidance for performing SSFAs in order to improve overall performance and self regulation. The GAP recommends specific SSFA content, team composition, sharing of lessons learned and provides general expectations for the SSFA host utility, Westinghouse and peer participants. The GAP will also serve as guidance for the host utility when communicating with peer utility SSFA team members and/or the NRC.

This revision of the GAP reflects additional guidance on the conduct of an SSFA based on the NRC's Revised Oversight Process. The NRC Revised Oversight Process (ROP) identifies seven cornerstones of safety. The NRC evaluates plant performance by evaluating two distinct inputs: inspection observations resulting from the NRC's inspection program and performance indicators (PIs) reported by the utility. NRC inspection guidance for Safety System Design and Performance Capability (Attachment 71111.21) provides insight on the criteria and methodology that will be used during NRC inspections.

The NRC is evaluating the use of Licensee Self Assessments (LSA) as part of the NRC ROP. It is the intent of the CEOG utilities to perform SSFAs that could be recognized by the NRC as supporting the LSA initiative.

2. Scope

The primary objective of an SSFA is to assess the operational performance capability of selected safety systems, through a selective review to verify that the selected systems are

capable of performing their intended safety functions. The SSFA will be performed not only to demonstrate compliance with NRC inspection requirements but also to capture best practices, operational improvements and knowledge sharing between utility peers. The SSFAs will use NRC Inspection Procedure 71111.21 Safety System Design and Performance Capability as a basis for the conduct of the SSFA.

Overview

NRC IP 71111.21 provides guidance on the selection of systems and components for the SSFA. In general it is recommended that the SSFA should select a risk significant system used for mitigating an accident or maintaining barrier integrity. Selection of 2 or more significant components is recommended for in-depth inspection.

System Selection

It is recommended that the following guidance be utilized in selection of the system:



Component Selection

It is recommended that the following guidance be utilized in selection of the important components:



[]

Scope considerations for site specific SSFAs may include, but are not limited to:

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The scope of the site specific SSFA may also create the opportunity to determine program related root cause(s) for any identified performance deficiencies and analyze the implications of these deficiencies on plant programs and processes.

The site specific SSFA plan will consider, whenever feasible, industry operating experience. The site specific SSFA plan may also consider reviewing other selected industry system inspection reports for the purpose of identifying additional areas of assessment and to apply lessons learned, (i.e. NRC IN 98-22 "Deficiencies identified during NRC Design Inspections," other plant INPO/NRC inspection reports). The site specific SSFA plan may consider attributes from other NRC Inspection Manual procedures. Other NRC Inspection Procedures that may be considered are:

- IP 71111 "Reactor Safety-Initiating Events, Mitigating Systems, Barrier Integrity"
- IP 71111.01 "Adverse Weather Protection"
- IP 71111.02 "Evaluation of Changes, Tests, or Experiments"
- IP 71111.04 "Equipment Alignment"
- IP 71111.05 "Fire Protection"
- IP 71111.07 "Heat Sink Performance"
- IP 71111.08 "In-service Inspection Activities"
- IP 71111.11 "Licensed Operator Re-qualification Program"
- IP 71111.12 "Maintenance Rule Implementation"

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- IP 71111.13 "Maintenance Risk Assessments and Emergent Work Evolutions:
 - IP 71111.14 "Personnel Performance During Non-routine Plant Evolutions"
 - IP 71111.15 "Operability Evaluations"
 - IP 71111.16 "Operator Workarounds"
 - IP 71111.17 "Permanent Plant Modifications"
 - IP 71111.19 "Post Maintenance Testing"
 - IP 71111.20 "Refueling and Outage Activities"
 - IP 71111.22 "Surveillance Testing"
 - IP 71111.23 "Temporary Plant Modifications"
 - IP 71152 "Corrective Action Programs"

The host utility will determine safety system selection. Each plant specific SSFA plan will be generated to the host plant specific program requirements.

The assessment is conducted as a selective review of the system. By the nature of a selective review, the utility will develop an assessment plan to provide guidance to the assessment team. IP 71111.21 shall be reviewed and used as a basis for the assessment plan.

Issues with the potential for generic implications will be properly documented but not necessarily evaluated as part of the SSFA. It will be the host utility's responsibility to determine the appropriateness and means to notify the industry, specifically other CE plant design plant owners, of potential generic problem implications.

The Resource Sharing Subcommittee participant utilities will determine the periodicity of these SSFAs.

3. Conduct of Assessment

The site specific SSFA will be conducted utilizing best practice or proven techniques, such as those outlined in NRC Inspection Procedure 71111.21, Inspection Manual Procedures 93801 and 93809 and those used by INPO. It is recommended that the team utilize the following "good practices":

- Team members should read and familiarize themselves with the scope of the assessment prior to the start of the assessment.

-
- Team members should be familiarized with techniques for daily debriefs and how to write field observations as addressed in INPO training material.
 - Any team observation should be treated as preliminary until sufficient documentation and facts are obtained to substantiate it. All observations should be thoroughly investigated and challenged by the team prior to classification as a Recommendation, Adverse Condition or Strength.
 - Review the NRC documents "Diagnostic Evaluation Team Manager's Handbook" and "Guidelines for Diagnostic Evaluations"¹ for assessment techniques and audit areas.
 - Daily team debriefs are encouraged to enable the team to challenge observations and supporting information, share information and look for commonalities in potential strengths and weaknesses. Review specific items on debriefings in Lessons Learned Summary.
 - Plant management shall be involved in the routine debriefings.
 - All personnel interviews should be documented and treated as confidential and sensitive information. Every effort should be made to distinguish facts from speculation and/or opinion.
 - The SSFA shall always be conducted utilizing site specific program requirements.
 - Field walk-downs of the associated systems will strengthen the assessment. Thoroughly review the configuration documentation prior to the walk-downs to gain facts and pre-identify issues.
 - Prior to initiation of the SSFA, the team leader in consultation with the team members should ensure that all functional areas of the plan (Engineering Design and Configuration Control, Operations, Maintenance, Surveillance and Testing, and Quality Assurance and Corrective Actions) have been adequately and appropriately assigned to each of the team members.

¹ Copy provided to the CEOG RSSC members via CEOG Project Office letter March 1999, CEOG 99-076.

SSFA Prerequisites

1. Safety systems are selected
2. Corrective action documentation search is completed
3. Team composition is finalized
4. Identify team work assignments
5. Match team skills to SSFA work scope
6. Team members have received copies of:

7. Response Team Key Contacts are identified. Note: Host utility shall establish a SSFA response team. This team provides contacts within the normal plant organization who will respond and/or coordinate SSFA team member interviews, question responses, data gathering, etc. It is recommended that the response team include members from the Design Engineering, Systems Engineering, Maintenance and Operations organizations.
8. Tracking process for information requests and open items is available
9. Relevant information/documentation is identified and available:





10. Dedicate adequate work space for the duration of the SSFA. Note: Work area for SSFA should allow for the team to engage in private and open dialog when attempting to validate observations.
11. Clerical/Technician support is available and confirmed for the duration of the SSFA. Utility personnel should be made available to perform database queries and searches.
12. Support personnel, such as subject matter experts, records management staff should be made available as-needed for timely support to the assessment.
13. Establish protocols for SSFA related briefings and communications.
14. Obtain adequate computer hardware and software to support SSFA team productivity. Access/passwords should be prearranged to ensure access to office productivity software.

Team Composition

The conduct of the SSFA requires a significant commitment of resources to ensure a quality initiative and viable results. [

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Selected team members should possess the skills, knowledge, and/or expertise, as appropriate, to provide a fully functional team and be able to adequately address the planned scope of the site specific SSFA. Team members shall be indoctrinated in inspection techniques. Team members should also have self-assessment experience. If not, access to training material on techniques for self assessment should be provided by the member's utility.

Skills, knowledge and expertise for consideration are:

- **Assessment leadership**
- **Mechanical engineering**
- **Electrical engineering**
- **Civil/Structural engineering**
- **Licensing**
- **Safety analysis**
- **Operations**
- **Maintenance**
- **System engineering**
- **Surveillance and testing**
- **I&C/setpoint & loop uncertainty engineering**
- **Equipment qualification**
- **Fire protection**
- **Reactor engineering**
- **QA audit experience**
- **Radiological analysis**
- **Component level knowledge**
- **Configuration management knowledge**

Ideally individual team members with multiple areas of expertise should be utilized to reduce the total number of resources required to perform the SSFA and to enhance the team's overall skill and knowledge. Peer team member selection is intended to enhance or augment the available host SSFA team membership. It is a benefit to the SSFA team and the quality of the SSFA results if some team members have sufficient CE operating plant and industry operating experience.

Selection of the team leader is one that will set the expectation of the assessment. The leader needs to demonstrate and promote ownership, tenacity and thoroughness for investigating issues, to establish if there is a real issue or not. The leader needs to be an authority as opposed to one that is simply helpful to the team.

Recommended Sequence of Events

A large, empty rounded rectangular box with a thin black border, intended for a recommended sequence of events. The box is vertically oriented and occupies most of the page's content area.

Reports

The site specific SSFA self assessment plans and the subsequent final self assessment report shall be distributed to all CEOG plants members supporting the CEOG SSFA resource sharing effort whether or not they actively participated in the associated specific SSFA.

The final SSFA report will be developed using the generic format (Attachment B). The report shall document the conduct and observations of the assessment. The report shall document the basis and selection process associated with the specific SSC (system, structure or component) that was the subject of the assessment.

The final report will be generated as a CEOG document. Final reports may contain host plant sensitive information. Therefore, all reports will be marked as a Westinghouse Proprietary Class 2 to control external distribution.

4. Lessons Learned

It is an important part of resource sharing and the success of the SSFAs conducted that lessons learned be developed and shared with all CEOG participant plants. It is essential to always remain self critical of the process and to provide feedback on both things that worked well and areas that need improvement. Continuous improvement will lead to an optimum process and an efficient use of resources yielding high quality products.

It is intended that the CEOG RSSC and specified SSFA participants to gather and record lessons learned from the SSFA. Host SSFA leaders or the corresponding CEOG RSSC members should present feedback from their recent assessment at scheduled RSSC meetings or conference calls. Lessons Learned will be compiled in one document for use by the RSSC.

5. Expectations

Host Plant

- Provides SSFA team leader.

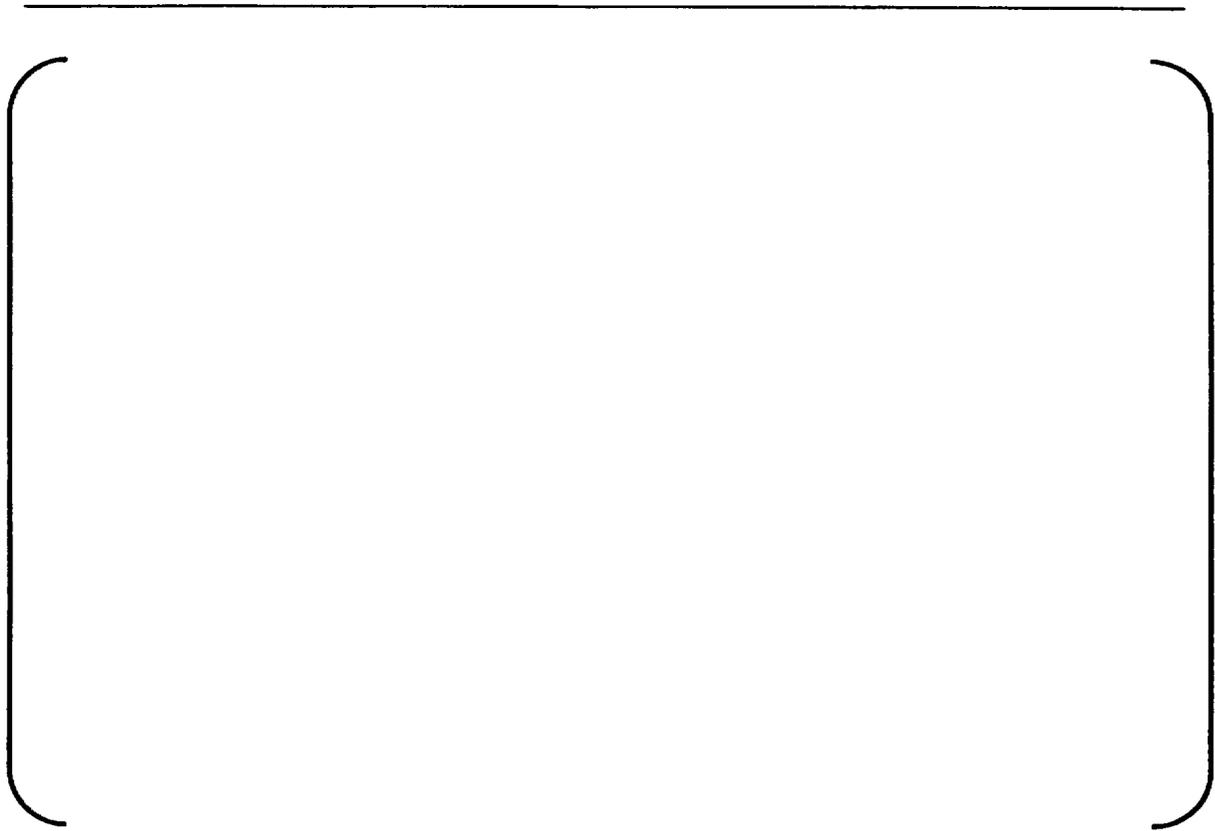
-
- Provide early notification to all team members of SSFA work scopes and deliverables.
 - Provides administrative and computer support.
 - Responsible for NRC interface and communications.
 - Owns SSFA observations and corrective actions.
 - Establishes SSFA Information requests and open item tracking.
 - Determines how corrective actions will be implemented.
 - Provides timely notification to SSFA schedule change to Peers.
 - Responsible to setup and coordinate on-site interviews during SSFA.
 - Financially responsible for all contract support to SSFA.
 - Facilitate notification to CEOG members when organizing SSFA / forming SSFA team.

Peer Participation

- Arrive the evening before the assessment and leave after the exit meeting.
- Ideally commits to audit for 2 weeks but not less than 1 week.
- Provide SSFA Leader with all field notes and Observations before leaving site at end of SSFA.
- Ideally complete final report input prior to leaving site at end of SSFA.
- Return all proprietary and sensitive documentation to SSFA leader.
- Prepares for SSFA prior to arrival on site.
- Supplies host access/escort information as necessary to support SSFA.
- Responsible for all travel and subsistence costs associated with their support to the host SSFA.

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ATTACHMENTS

Attachment A: Team Observation Format..... 16

Attachment B: SSFA Report Format 17

Attachment C: Recommended SSFA Plan 19

Attachment D: SSFA Feedback Form 27

Attachment A: Team Observation Format

Team Observations:

Observation No: _____

TEAM MEMBER: _____

Date of Observation: _____

Description: (Provide a 2 sentence description of Observation.)

Check One:

Recommendation Adverse Condition Strength

Area of inspection (Refer to Inspection Plan Section 4):

Documents reviewed (Include revision and/or date issued):

Personnel contacted (Name, position and date of meeting):

Issue / Strength: (Provide sufficient detail to allow an independent party to reach your conclusion. Provide criteria, procedure or practice on which the observation was based.)

Team Member's Conclusion:

Condition Report Issued (Y/N): _____ CR Number: _____

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1.0 EXECUTIVE SUMMARYX

2.0 ASSESSMENT SCOPE / PROGRAM DESCRIPTION.....X

3.0 ASSESSORS.....X

4.0 ASSESSMENT OBJECTIVES.....X

5.0 PERFORMANCE STANDARDSX

6.0 CONCLUSIONSX

7.0 OBSERVATION BRIEFSX

8.0 ACTION REQUESTSX

9.0 KEY PERSONNEL CONTACTED.....X

10.0 DOCUMENTS REFERENCEDX

APPENDIX A - DETAILED OBSERVATIONS A-1

APPENDIX B – ASSESSOR SUMMARIES B-1

[Other attachments as necessary by choice of Utility.]

Note that the format and content of this sample Report is provided as guidance for developing the plant specific assessment report. Existing utility guidance may exist that also provides this information and can, in instances, take president over the following suggested format and content. However, it is highly suggested that this example report be followed as much as possible since the CEOG Resource Sharing Subcommittee intent is to maintain consistency in these assessments.

Assessment Number [xxx]

Safety System Functional Assessment [System Name]

*Note: Italicized text is to be
replaced as appropriate.*

For

*[Utility Name]
[Plant Name]*

[Date]

Team Leader

Responsible Functional Manager

[Other Approval as necessary by Utility requirements]

Table of Contents

1. System to be Inspected	X
2. Scope	X
3. Team Members.....	X
4. Conduct of the Inspection	X
5. Definitions.....	X
6. Conduct during the Inspection	X
7. References	X
 Attachment 1 Documentation of Observations.....	 X
 <i>[Other attachments as necessary by choice of Utility.]</i>	

Note that the format and content of this sample Plan is provided as guidance for developing the plant specific assessment plan. Existing utility guidance may exist that also provides this information and can, in instances, take precedent over the following suggested format and content. However, it is highly suggested that this example Plan be followed as much as possible since the CEOG Resource Sharing Subcommittee intent is to maintain consistency in these assessments.

Attachment C: Recommended SSFA Plan

1. SYSTEM TO BE ASSESSED

[Describe the system to be assessed. Provide sufficient detail to define the physical boundaries.]

2. ASSESSMENT SCOPE

[Edit this section as appropriate.]

The scope of the Safety System Functional Assessment (SSFA) is to assess *[the plant's]* engineering effectiveness through an in-depth review of calculations, analyses and other engineering documents used to support system performance during normal and accident or abnormal conditions. The assessment will determine the quality of safety evaluations performed in support of engineering modifications on the system.

The assessment will follow the CEOG Resource Sharing Subcommittee Generic Assessment Plan (Reference 1) and *[Utility specific procedure for engineering assessments]* (Reference 2) and *[cover recent cycles]* of plant operation.

3. ASSESSMENT TEAM MEMBERS

[Empty section for Assessment Team Members]

4. CONDUCT OF THE ASSESSMENT

[Edit this section and subsections as appropriate.]

The assessment will be conducted in accordance with the CEOG Resource Sharing Subcommittee Generic Assessment Plan (Reference 1) and *[Utility specific procedure for engineering assessments]* (Reference 2). Prior to initiating the assessment, the Team Leader will review the applicable Lessons Learned from CEOG Reference 3 with the assessment team members.

[The areas identified in this section are intended to be inclusive of those topics available for inspection. Based on the time allowed for the assessment a sampling of these areas may be considered to be acceptable as determined by the team.]

Attachment C: Recommended SSFA Plan

4.1 []

[]

4.2 []

[]

4.3 []

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Attachment C: Recommended SSFA Plan

4.4

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4.5

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Attachment C: Recommended SSFA Plan

4.6

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4.7

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4.8

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4.9

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[]

4.10 [

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5. CLASSIFICATION OF OBSERVATIONS

During the course of each reviewer's assessment of the subject system, Observations will be made. Observations are a problem or concern developed from reviews performed for this assessment. Observations may consist of strengths, weaknesses, adverse conditions, recommendations, areas not meeting expectations or areas of improvement. The following definitions will be used to classify each Observation for categorizing and summarizing the results of the assessment.

Attachment C: Recommended SSFA Plan

6. CONDUCT DURING THE INSPECTION

[Edit this section as appropriate.]

- 6.0 Each Team Member shall adhere to the [*Host Utility's*] policies and [*Standing Orders*].
- 6.1 During the performance of observations, should any Team Member see any acts that may create an immediate safety concern or poor radiological work practice, the activity shall be stopped and appropriate person(s) corrected on the spot. Personnel safety will always be a primary concern.
- 6.2 Each reviewer should develop an informal inspection plan consisting of areas of review, documents to be reviewed and personnel to be contacted. This plan should be communicated to the team leaders in order to provide access to documents and plant personnel
- 6.3 All Recommendation and Adverse Condition observations shall have a [*Condition Report*] written in accordance with [*host utility procedure*]

[]
- 6.5 Observations will be documented in a standard format on copies of Attachment 1, Reference 1. All observations will be submitted for inclusion in the final report that will be in the format of Attachment 2 of Reference 1.
- 6.6 If an area of work is currently in process to support an area of review, the reviewer should review the manner in which the work is being conducted.
- 6.7 When an observation has been made, determine if a broader overall issue exists and, to the extent practical, determine if deficiencies are performance based. In addition, focus on causes or barriers that contribute to identified problems (strive to answer the question – WHY?).

7. REFERENCES:

- 1. CEOG Resource Sharing Subcommittee Generic Assessment Plan, [*Latest Revision*].
- 2. [*Utility specific procedure for engineering assessments*].
- 3. CEOG Safety System Functional Assessment, Lessons Learned, [*Latest Revision*].

[List other References as necessary]

Attachment D: CEOG Peer Assessor Feedback Form

Following each assessment, the CEOG Project Manager will issue this form to each participating Peer to collect constructive feedback on the conduct of the SSFA.

**CEOG RSSC SSFA
Peer Reviewer Feedback Form**

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