



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

March 29, 2012

Mr. Joseph W. Shea
Manager, Corp. Nuclear Licensing Programs
Tennessee Valley Authority
1101 Market Street, LP 4B-C
Chattanooga, TN 37402-2801

**SUBJECT: SEQUOYAH NUCLEAR PLANT – NRC SUPPLEMENTAL INSPECTION
REPORT 05000327/2012007 AND NRC ASSESSMENT FOLLOW-UP LETTER**

Dear Mr. Shea:

On March 9, 2012 the U. S. Nuclear Regulatory Commission (NRC) completed a supplemental inspection pursuant to Inspection Procedure 95001, "Supplemental Inspection for One or Two White Inputs in a Strategic Performance Area," at the Tennessee Valley Authority (TVA) Sequoyah Nuclear Plant, Unit 1. The enclosed inspection report documents the inspection results, which were discussed with Mr. J.T. Carlin and other members of the staff during the exit and regulatory performance meetings on March 9, 2012

As required by the NRC Reactor Oversight Process Action Matrix, the NRC preformed a supplemental inspection because of an identified White Performance Indicator resulting from Unit 1 exceeding three reactor scrams per 7000 critical hours. The NRC previously documented this issue in the Third Quarter Assessment Letter dated November 10, 2011. In a letter dated February 8, 2012, TVA informed the NRC of their staff's readiness for this inspection.

The objectives of the supplemental inspection were to provide assurance that: (1) the root causes and contributing causes of risk-significant performance issues are understood; (2) the extent of condition and extent of cause of risk-significant performance issues are identified; and (3) the licensee's corrective actions for risk-significant performance issues are sufficient to address the root and contributing causes and prevent recurrence. The inspection consisted of examination of activities conducted under TVA's license as they related to safety, compliance with the Commission's rules and regulations, and the conditions of TVA's operating license.

Based on the results of the inspection, no significant weaknesses were identified. The inspectors determined that, in general, TVA's problem identification, root cause analysis, and corrective actions were adequate. As stated in TVA's evaluation, the identified primary root cause for the issue was an inadequate identification and mitigation of balance of plant system vulnerabilities. The inspector identified one self-revealing finding of very low safety significance (Green); this finding does not involve a violation of NRC requirements. Because of the very low safety significance of this issue and because it was entered into the corrective action program, the NRC is treating this as a finding consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If TVA wishes to contest this finding, TVA should provide a response, with the basis for the denial, within 30 days of the date of this inspection report to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Sequoyah Nuclear Plant.

Additionally, if TVA disagrees with the characterization of any finding in this report, TVA should provide a response within 30 days of the date of this inspection report, with the basis for the disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector at the Sequoyah Nuclear Plant. The information provided will be considered in accordance with Inspection Manual Chapter 0305.

Because the PI for trips in 7000 critical hours has reverted to Green and the 95001 Inspection has been completed successfully, in accordance with the guidance in Inspection Manual Chapter (IMC) 0305, "Operating Reactor Assessment Program", the NRC will no longer consider the White PI in assessing the plant performance. In addition, the NRC considers that Unit 1 will transition to Column 1 of the NRC's Action Matrix as of the date of this assessment followup letter. The NRC will however, review the implementation and effectiveness of the licensee's corrective actions during future inspections.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and TVA's response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Scott M. Shaeffer, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Docket Nos. 50-327
License Nos. DPR-77

Enclosure: Inspection Report 05000327/2012007 and
NRC Assessment Follow-up Letter
w/Attachment: Supplemental Information

cc w/ encl. (See next page)

TVA

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cc w/encl:
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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-327

License No.: DPR-77

Report No: 05000327/2012007

Licensee: Tennessee Valley Authority (TVA)

Facility: Sequoyah Nuclear Plant, Unit 1

Location: Sequoyah Access Road
Soddy-Daisy, TN 37379

Dates: March 5-9, 2012

Inspectors: R. Clagg, Resident Inspector, North Anna Power Station (lead)
C. Young, Senior Resident Inspector, Sequoyah Nuclear Plant

Approved by: Scott M. Shaeffer, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

Inspection Report 05000327/2012007; 3/5/2012 – 3/9/2012; Sequoyah Nuclear Plant, Unit 1; Supplemental Inspection for One or Two White Inputs in a Strategic Performance Area, Event Followup

NUREG-1649, "Reactor Oversight Process," (ROP) Revision 4, dated December 2006 describes the NRC's program for overseeing the safe operation of commercial nuclear power reactors. As required by the NRC's ROP Action Matrix, a NRC Senior Resident Inspector and Resident Inspector performed a supplemental inspection to assess the licensee's evaluation associated with a White Performance Indicator in the Initiating Events cornerstone associated with greater than three reactor trips in 7000 critical hours. The inspectors performed the inspection in accordance with Inspection Procedure (IP) 95001, "Supplemental Inspection for One or Two Inputs in a Strategic Performance Area." The inspectors identified one Green finding, which did not involve a violation of NRC requirements. The significance of most findings is identified by a corresponding color (Green, White, Yellow, or Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP); the cross-cutting aspect is determined using IMC 0310, "Components Within the Cross-Cutting Areas." Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review.

Based on the results of this inspection, no significant weaknesses were identified. The inspectors concluded that, in general, the licensee properly determined: who and under what conditions issues were identified, how long issues existed and prior opportunities for identification, the plant risk specific consequences as applicable, and compliance concerns associated with issues. The inspectors also concluded that, in general, the licensee properly: evaluated issues using a systematic methodology to identify the root and contributing cause, conducted root cause evaluations to a level of detail commensurate with the significance of the problem, considered prior occurrences of the problem and of prior operating experience in root cause evaluations, addressed the extent of condition and extent of cause of the problem in root cause evaluations, and considered the safety culture components as described in IMC 0305 in root cause, extent of condition, and extent of cause evaluations. The inspectors also concluded that, in general, the licensee properly: specified appropriate corrective actions for each root and contributing cause or properly evaluated why no corrective actions are necessary, prioritized corrective actions with consideration of the risk significance and regulatory compliance, established a schedule for implementing and completing the corrective actions, and developed quantitative or qualitative measures of success in determining the effectiveness of the corrective actions to prevent recurrence.

One observation was noted regarding the lack of a programmatic review involving the implementation of preventive maintenance (PM) activities given that three of the reviewed root cause evaluations included corrective actions involving the development of PMs. The inspectors did consider that the licensee's ongoing PM optimization program should address this area.

Because the PI for trips in 7000 critical hours has reverted to Green and the 95001 Inspection has been completed successfully, in accordance with the guidance in Inspection Manual Chapter (IMC) 0305, "Operating Reactor Assessment Program," the NRC will no longer consider the White PI in assessing the plant performance. The NRC will however, review the implementation and effectiveness of the licensee's corrective actions during future inspections.

Enclosure

A. NRC Identified and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. A self-revealing finding was identified for the licensee's failure to properly implement work procedures during the performance of a preventive maintenance (PM) activity associated with the Unit 1 Preferred Inverter. The improper performance of selected steps with the system in an inappropriate configuration to support the activity caused an electrical transient and loss of the preferred power board which resulted in a turbine trip and automatic reactor trip. The licensee entered this issue into their corrective action program as PER 405141 and implemented corrective actions to include guidance for operations supervisory review of work documents prior to returning equipment to service.

The inspectors reviewed IMC 0612, Appendix B and determined that the finding was more than minor because it adversely impacted the human performance attribute of the initiating events cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, it resulted in sudden closure of all main turbine governor valves from 100% power, which ultimately led to an automatic reactor trip. The inspectors reviewed IMC 0609, Attachment 4 and determined that the finding was of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigating systems would not be available.

This finding was determined to have a cross-cutting aspect in the area of human performance, the component of work control, and the aspect of work activity coordination, H.3(b), due to the failure to appropriately coordinate this work activity consistent with nuclear safety. Specifically, the necessary interdepartmental communication and coordination between operations and maintenance work groups was inadequate to assure proper performance and accomplishment of the work activity in accordance with the procedure, including establishing proper plant conditions to support the work activity as well as understanding the potential operational impact of the proposed maintenance. (Section 4OA3.2)

B. Licensee Identified Violations

None

REPORT DETAILS

4. OTHER ACTIVITIES

4OA3 Event Followup

.1 (Closed) Licensee Event Report (LER) 05000327/2011-003-00 and -01: Unit 1 Reactor Trip As a Result of Turbine Control Card Failure

On June 26, 2011, Unit 1 reactor was automatically tripped when main turbine governor and throttle valves closed as a result of the failure of a turbine analog electro-hydraulic (AEH) signal conditioning card. The inspectors evaluated plant status, mitigating actions, and the licensee's classification of the event. The event was reported to the NRC as event notification (EN) 46991 and documented in the licensee corrective action program as PER 393838, which included a root cause evaluation.

The inspectors discussed the event with operations, maintenance, engineering, and licensee management personnel to gain an understanding of the conditions leading up to the event and assess licensee actions taken following the event. Additionally, the inspectors reviewed the root cause evaluation report to assess the thoroughness of the evaluation and the adequacy of the proposed corrective actions. The licensee's root cause evaluation identified that the failure of the turbine AEH card was due to a resistor failure on the card. The root and contributing causes were determined to be: a failure to identify and mitigate single point vulnerabilities (SPVs) in the AEH system (specifically printed circuit boards (PCBs)), a lack of preventive maintenance activities and/or testing to identify/mitigate degradation of this component, and a failure to implement a 1996 reliability study recommendation to replace the AEH system. The inspectors concluded that the licensee's corrective actions to this event were appropriate, including implementation of a PCB life cycle management program, implementation of a SPV mitigation program, pro-active review of the AEH system replacement project, and increased accountability of system engineer assignments and responsibilities.

The inspectors also verified that timely notifications were made in accordance with 10 CFR 50.72, that licensee staff properly implemented the appropriate plant procedures, and that available plant equipment performed as required during the event. One exception noted was that plant operators placed the rod control system in the manual mode of operation approximately 8 seconds after automatic inward rod motion commenced (upon turbine load reduction). This action stopped control rod motion. Rod control was returned to automatic operation after the error was recognized approximately 10 seconds later, just before the automatic reactor trip occurred when turbine throttle valves reached their full closed positions. This action was not in accordance with plant operating procedures, but did not significantly contribute to or complicate the event. The licensee entered this issue into their CAP as PER 420079. The inspectors reviewed the cause evaluation and corrective actions for this PER as well. These LERs are closed.

Enclosure

.2 (Closed) Licensee Event Report (LER) 05000327/2011-004-00 and -01: Reactor Trip As a Result of a Loss of Preferred Inverter

a. Inspection Scope

On July 20, 2011, Unit 1 reactor was automatically tripped when a loss of power to the preferred power board #1 resulted in turbine governor valve closure. The inspectors evaluated plant status, mitigating actions, and the licensee's classification of the event. The event was reported to the NRC as EN 47081 and documented in the licensee corrective action program as PER 405141, which included a root cause evaluation.

The inspectors discussed the event with operations, maintenance, engineering, and licensee management personnel to gain an understanding of the conditions leading up to the event and assess licensee actions taken following the event. Additionally, the inspectors reviewed the root cause evaluation report to assess the thoroughness of the evaluation and the adequacy of the proposed corrective actions. The licensee's root cause evaluation identified that the loss of power was due to improper performance of a maintenance activity on the preferred inverter #1. The identified root and contributing causes included: improper performance of the PM steps for frequency checks, inadequate procedural guidance to require operations supervisory review of completed work documents prior to returning equipment to service, inadequate pre-job brief for the activity, and failure to establish the appropriate equipment configuration to support the proposed maintenance. The inspectors concluded that the licensee's corrective actions to this event were appropriate, including: implement guidance for operations supervisory review of work documents prior to returning equipment to service, establish further maintenance supervisory engagement and oversight during backshift periods to include interfacing with operations supervision regarding control of work activities, revise procedures to clarify actions required when procedure steps are not performed correctly or missed, and implement revisions and improvements to the PM procedure for this activity.

The inspectors also verified that timely notifications were made in accordance with 10 CFR 50.72, that licensee staff properly implemented the appropriate plant procedures, and that available plant equipment performed as required during the event. One finding was identified as discussed below. These LERs are closed.

b. Findings

Introduction. A Green self-revealing finding was identified for the licensee's failure to properly implement work procedures during the performance of a preventive maintenance (PM) activity associated with the Unit 1 Preferred Inverter. The improper performance of selected steps with the system in an inappropriate configuration to support the activity caused an electrical transient and loss of the preferred power board. This resulted in a turbine trip and reactor trip of Unit 1.

Description. On July 20, 2011, a PM activity was scheduled to be performed on the Unit 1 preferred inverter under work order (WO) 111787573 using preventive maintenance

(PM) procedure 059601002, "Inspect and clean Rotoups preferred inverter #1 and check belt tension," Revision 1, which required coordination between the electrical maintenance group and operations personnel. One portion of this PM procedure required operations personnel to establish conditions to support voltage and frequency measurements to be taken by maintenance personnel. This involved starting up the preferred inverter, but not tying it to the preferred power board. Once this configuration was achieved, maintenance personnel obtained the required voltage measurements, but inadvertently overlooked and omitted the steps to obtain frequency measurements. The inverter was then restored to an in-service configuration, supplying power to the preferred power board, in accordance with the remaining steps in the procedure.

After the above activities had been completed, maintenance personnel discovered that the procedure steps to obtain frequency measurements had been inadvertently missed during the performance of that section of the procedure. The maintenance foreman then obtained permission from the operations work control supervisor to perform the missed steps with the equipment in the current configuration. The maintenance foreman then obtained a type of frequency meter that had not been previously used for this activity. When the meter was attempted to be connected to the inverter, it was connected incorrectly and induced an electrical transient that resulted in a blown fuse in the inverter and a loss of power output. Because the inverter was aligned to the preferred power board supplying power, the power loss resulted in the sudden closure of all main turbine governor valves. This constituted a 100% load reject similar to a turbine trip, except with no concurrent automatic reactor trip. Five seconds later, both pressurizer power operated relief valves opened to relieve the resulting increase in reactor coolant system pressure. After a total of eight seconds had elapsed, an automatic reactor trip occurred due to the negative neutron flux rate sensed as a result of automatic control rod insertion and RCS heatup.

The licensee entered this issue into their corrective action program (CAP) as PER 405141. The licensee performed a root cause evaluation, which determined that the root and contributing causes of the event included: improper performance of the PM steps for frequency checks, inadequate procedural guidance to require operations supervisory review of completed work documents prior to returning equipment to service, inadequate pre-job brief for the activity, and failure to establish the appropriate equipment configuration to support the proposed maintenance. Corrective actions included: implement guidance for operations supervisory review of work documents prior to returning equipment to service, establish further maintenance supervisory engagement and oversight during backshift periods to include interfacing with operations supervision regarding control of work activities, revise procedures to clarify actions required when procedure steps are not performed correctly or missed, and implement revisions and improvements to the PM procedure for this activity.

The inspectors concluded that the failure to properly perform the preferred inverter maintenance activity in accordance with the applicable PM procedure constituted a failure to meet the site standards for conduct of maintenance and procedure use and adherence contained in MMDP-1, "Maintenance Management System," Revision 21, and NPG-SPP-01.2, "Administration of Site Technical Procedures," Revision 2.

Enclosure

Analysis. The inspectors determined that the licensee's failure to properly perform the Preferred Inverter #1 preventive maintenance activity in accordance with WO 111787573 and PM procedure 059601002 was a performance deficiency. The inspectors reviewed IMC 0612, Appendix B and determined that the finding was more than minor because it adversely impacted the human performance attribute of the initiating events cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, it resulted in sudden closure of all main turbine governor valves from 100% power, which ultimately led to an automatic reactor trip. The inspectors reviewed IMC 0609, Attachment 4 and determined that the finding was of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigating systems will not be available.

This finding was determined to have a cross-cutting aspect in the area of human performance, the component of work control, and the aspect of work activity coordination, H.3(b), due to the failure to appropriately coordinate this work activity consistent with nuclear safety. Specifically, the necessary interdepartmental communication and coordination between operations and maintenance work groups was inadequate to assure proper performance and accomplishment of the work activity in accordance with the procedure, including establishing proper plant conditions to support the work activity as well as understanding the potential operational impact of the proposed maintenance.

Enforcement. Enforcement action does not apply because the performance deficiency did not involve a violation of regulatory requirements. No violation of NRC requirements was identified since the subject preferred inverter was not a safety-related component. Because this finding does not involve a violation of regulatory requirements, is of very low safety significance (Green), and has been entered into the licensee's CAP as PER 405141, it is being treated as FIN 05000327/2012007-01, Reactor Trip due to Improper Preferred Inverter Maintenance.

.3 (Closed) Licensee Event Report (LER) 05000327/2011-005-00 and -01: Reactor Trip As a Result of Reactor Coolant Pump Undervoltage

On August 18, 2011, Unit 1 reactor was automatically tripped when a transfer of the 1A Start Bus to its alternate power supply caused a momentary undervoltage condition to be sensed on two reactor coolant pump power supplies. The inspectors evaluated plant status, mitigating actions, and the licensee's classification of the event. The event was reported to the NRC as EN 47169 and documented in the licensee corrective action program as PER 419705, which included a root cause evaluation.

The inspectors discussed the event with operations, maintenance, engineering, and licensee management personnel to gain an understanding of the conditions leading up to the event and assess licensee actions taken following the event. Additionally, the inspectors reviewed the root cause evaluation report to assess the thoroughness of the evaluation and the adequacy of the proposed corrective actions. The licensee's root cause evaluation identified that the start bus transfer was due to the failure of a

secondary side potential transformer fuse within the start bus protective relay circuit. The root and contributing causes were determined to be: the lack of preventive maintenance (PM) activities/program to address periodic replacement of these type of fuses, as well as the lack of implementation of a single point vulnerability (SPV) program for the site. The inspectors concluded that the licensee's corrective actions to this event were appropriate, including: the establishment of PMs to address fuse replacement, replacement of this type of fuse in applications throughout the plant, and implementation of a SPV program for the site.

The inspectors also verified that timely notifications were made in accordance with 10 CFR 50.72, that licensee staff properly implemented the appropriate plant procedures, and that available plant equipment performed as required during the event. These LERs are closed.

40A4 Supplemental Inspections

.1 Inspection Scope

The supplemental inspection was performed in accordance with IP 95001 to assess the licensee's evaluation of a White PI, which affected the Initiating Events cornerstone objective in the Reactor Safety strategic performance area. The White PI is associated with having greater than three reactor trips in 7000 critical hours. On July 20, 2011, the indicator transitioned from Green to White when Unit 1 had an automatic reactor trip due to a human performance error while conducting maintenance on the preferred inverter. Subsequent to this reactor trip, Unit 1 experienced another automatic reactor trip after the failure of a start bus fuse. The licensee notified the NRC in February 2012 that they were ready for this supplemental inspection. The inspection objectives were to:

- Provide assurance that the root and contributing causes of risk-significant performance issues are understood.
- Provide assurance that the extent of condition and extent of cause of risk-significant performance issues are identified.
- Provide assurance that the licensee's corrective actions for risk-significant performance issues are sufficient to address the root and contributing causes and prevent recurrence.

The inspectors reviewed problem evaluation report (PER) 407356, which documented the root cause evaluation (RCE) for Excessive Unplanned Scrams per 7000 hours for Unit 1, and its constituent PERs. PER407356 evaluated the RCEs conducted under the following PERs:

- PER290069, regarding a moisture separator reheater relief valve which was an identified vulnerability and whose failure resulted in a turbine trip. The inspectors also reviewed related PER285349 which documented a manual reactor trip due to failure of feedwater control to maintain steam generator water levels following the turbine trip described in PER290069.

- PER299269, regarding a fire in the main generator neutral bushing which was not an identified vulnerability and whose failure resulted in a scram event.
- PER393838, regarding the failure of an AEH card which was an identified vulnerability and whose failure resulted in a scram event.
- PER405141, regarding a trip of the preferred inverter trip, due to a human performance error, which resulted in a scram event.
- PER419705, regarding the failure of a start bus fuse which was an identified vulnerability and whose failure resulted in a scram event.

PER407356 evaluated these RCEs in the aggregate to determine the collective root cause of the scram events, any collective contributing causes, and the corrective actions required to improve performance and prevent recurrence. The inspectors reviewed station procedures, corrective actions documents, and interviewed licensee personnel in order to accomplish the above stated inspection objectives.

.2 Evaluation of the Inspection Requirements

.01 Problem Identification

- a. Determine that the evaluation documented who identified the issue (i.e., licensee-identified, self-revealing, or NRC-identified) and under what conditions the issue was identified.

The inspectors concluded that the licensee's RCEs were generally effective in determining who identified the issues and under what conditions it was identified.

- b. Determine that the evaluation documented how long the issue existed and prior opportunities for identification.

The inspectors concluded that the licensee's RCEs were generally effective in documenting how long issues existed and prior opportunities for identification. PER407356 is cumulative in nature and thus does not specifically address how long the issue existed or if there were prior opportunities for identification. However, the licensee performed a repeat event review to determine if the identified deficiency was a recurring event.

- c. Determine that the evaluation documented the plant-specific risk consequences, as applicable, and compliance concerns associated with the issue.

The inspectors concluded that the licensee's RCEs were generally effective in documenting the plant specific risk consequences, as applicable, and compliance concerns associated with the issue.

.02 Root Cause, Extent of Condition, and Extent of Cause Evaluation

- a. Determine that the problem was evaluated using a systematic methodology to identify the root and contributing causes.

The inspectors concluded that the licensee's RCEs were generally effective in evaluating problems using a systematic methodology to identify root and contributing causes. The inspectors noted that the licensee used varying methodologies in the RCEs that were reviewed for the inspection.

- b. Determine that the root cause evaluation was conducted to a level of detail commensurate with the significance of the problem.

The inspectors concluded that the licensee was generally effective in evaluating problems to a level of detail that was commensurate with its significance. The inspectors identified a weakness in that there was a lack of critical evaluation of organizational performance in root cause evaluations. The inspectors noted that the licensee has corrective actions in progress to address this issue.

- c. Determine that the root cause evaluation included a consideration of prior occurrences of the problem and knowledge of prior operating experience.

The inspectors concluded that the licensee's RCEs were generally effective in including consideration of prior occurrences of the problem and knowledge of prior operating experience.

- d. Determine that the root cause evaluation addressed the extent of condition and the extent of cause of the problem.

The inspectors concluded that the licensee's RCEs were generally effective in addressing the extent of condition and the extent of cause of problems.

- e. Determine that the root cause, extent of condition, and extent of cause evaluations appropriately considered the safety culture components as described in IMC 0305.

The inspectors concluded that the licensee's RCEs were generally effective in considering the safety culture components in root causes, extent of condition, and extent of cause. The inspectors noted that the licensee's evaluation process considers the applicability of each safety culture aspect and then addresses those that are determined to be applicable.

.03 Corrective Actions

- a. Determine that appropriate corrective actions are specified for each root and contributing cause or that the licensee has an adequate evaluation for why no corrective actions are necessary.

The inspectors concluded that the licensee's RCEs were generally effective in specifying appropriate corrective actions for each root cause and contributing cause or adequately evaluating why no corrective actions were necessary.

However, the inspectors identified that three of the reviewed RCEs included corrective actions to prevent recurrence (CAPR) that involved the implementation of preventative maintenance (PM) activities. The inspectors identified that there were no corrective actions in place to address a programmatic review of the licensee preventative maintenance program. In addition, the inspectors identified that the licensee did not evaluate the multiple occurrences of this CAPR in PER407356 or other activities undertaken in preparation for this inspection. The inspectors did note that the licensee has efforts underway regarding the optimization of their PM program. In addition, the licensee initiated a corrective action to evaluate the need for a CAPR regarding their PM program as documented in PER519536.

- b. Determine that corrective actions have been prioritized with consideration of risk significance and regulatory compliance.

The inspectors concluded that the licensee's RCEs were generally effective in prioritizing corrective actions taking into consideration risk significance and regulatory compliance.

- c. Determine that a schedule has been established for implementing and completing the corrective actions.

The inspectors concluded that the licensee's RCEs were generally effective in establishing a schedule for implementing and completing corrective actions.

- d. Determine that quantitative or qualitative measures of success have been developed for determining the effectiveness of the corrective actions to prevent recurrence.

The inspectors concluded that the licensee's RCEs were generally effective in developing quantitative or qualitative measures of success for determining the effectiveness of the corrective actions to prevent recurrence. The inspectors identified an implementation weakness in the ability to achieve desired results of the licensee's effectiveness reviews. Specifically, the licensee would rely on the absence of event recurrence as a major input to the evaluation of CAPR effectiveness. The inspectors noted that the licensee has corrective actions in progress to address this issue and to apply more robust effectiveness criteria to future reviews.

- e. Determine that the corrective actions planned or taken adequately address a Notice of Violation (NOV) that was the basis for the supplemental inspection, if applicable.

The inspectors concluded that a NOV was not part of the basis for this supplemental inspection.

4OA6 Meetings, Including Exit

.1 Exit Meeting Summary

On March 9, 2012, the inspectors presented the inspection results to Mr. J.T. Carlin and other members of the licensee's staff. The inspectors asked whether the licensee considered any of the material examined during the inspection proprietary; none was identified.

.2 Regulatory Performance Meeting

On March 9, 2012, a Regulatory Performance Meeting was held with Mr. J.T. Carlin and other members of the licensee's staff. The licensee staff discussed implementation of corrective actions. NRC staff reviewed the Reactor Oversight Process timeline for closing corrective actions and related inspection findings.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:

J. Carlin, Site Vice President
S. Connors, Operations Manager
G. Cook, Acting Director, Safety and Licensing
J. Cross, Chemistry Manager
A. Day, Radiation Protection Manager
C. Dieckmann, Manager, Maintenance
Z. Kitts, Licensing Engineer
W. Lee, Corporate Emergency Preparedness Manager
A. Little, Site Security Manager
J. Miller, Performance Improvement Manager
S. McCamy, Quality Assurance Manager
P. Noe, Site Engineering Director
J. Parshall, Corporate Emergency Preparedness
W. Peggram, Emergency Preparedness Specialist
P. Pratt, Work Control Manager
J. Proffitt, Acting Site Licensing Manager
J. Reidy, Operations Superintendent
P. Simmons, Plant Manager
D. Sutton, Licensing Engineer
N. Thomas, Licensing Engineer
C. Ware, Training Director
K. Wilkes, Operations Support Superintendent

NRC personnel:

W. Deschaine, Resident Inspector – Sequoyah Nuclear Plant

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

None

Opened and Closed

05000327/2012007-01	FIN	Reactor Trip due to Improper Preferred Inverter Maintenance (Section 4OA3.2)
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Closed

05000327/2011-003-00,-01	LER	Unit 1 Reactor Trip As a Result of Turbine Control Card Failure (Section 4OA3.1)
05000327/2011-014-00,-01	LER	Reactor Trip As a Result of a Loss of Preferred Inverter (Section 4OA3.2)
05000327/2011-005-00,-01	LER	Reactor Trip As a Result of Reactor Coolant Pump Undervoltage (Section 4OA3.3)

LIST OF DOCUMENTS REVIEWED

Procedures

NPG-SPP-09.18.1, "System Vulnerability Review Process", Revision 3
NPG-SPP-09.18.7, "Single Point Vulnerability Review Process", Revision 1
NPG-SPP-03.1.4, "Corrective Action Program Screening and Oversight", Revision 3
NPG-SPP-03.1.5, "Apparent Cause Evaluations", Revision 2
NPG-SPP-03.1.6, "Root Cause Analysis", Revision 2
NPG-SPP-03.1.6, "Root Cause Analysis", Revision 3
NPG-SPP-03.1.7, "PER Actions", Revision 2
NPG-SPP-03.1.9, "PER Closure", Revision 2
NPG-SPP-03.1.10, "PER Effectiveness Reviews", Revision 3
NPG-SPP-01.2, "Administration of Site Technical Procedures", Revision 2
0-TI-QXX-000-001.0, "Event Critique, Post Trip Report, and Equipment Root Cause," Revision 11
MMDP-1, "Maintenance Management System," Revision 21
MMDP-15, "Conduct of Maintenance – Expectations and Standards," Revision 3
Operations Directive Manual Appendix O, "Operations Guide to Daily Work Control and Schedule Review," Revision 6
TI-4, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting – 10CFR50.65," Revision 23

Work Orders

111787573
112396996
112589517

Miscellaneous

Health Threat Listing

Talisman International, LLC. Report, "Sequoyah Nuclear Plant Assessment, Unit 1 Scram Performance Indicator 95001 Inspection Readiness Assessment", dtd February 18, 2012
NRC Information Notice 2006-05, "Possible Defect in Bussmann KWN-R and KTN-R Fuses"

LIST OF ACRONYMS

ADAMS	Agencywide Document Access and Management System
CAPR	Corrective Action Prevent Recurrence
IMC	Inspection Manual Chapter
IP	Inspection Procedure
NAPS	North Anna Power Station
NRC	Nuclear Regulatory Commission
PI	Performance Indicator
RCE	Root Cause Evaluation