



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

August 6, 2013

Mr. Joseph W. Shea  
Vice President, Nuclear Licensing  
Tennessee Valley Authority  
3R Lookout Place  
1101 Market Street  
Chattanooga, TN 37402-2801

**SUBJECT: SEQUOYAH NUCLEAR PLANT – NRC PROBLEM IDENTIFICATION AND  
RESOLUTION INSPECTION REPORT 05000327/2013008, 05000328/2013008**

Dear Mr. Shea:

On June 27, 2013, the U. S. Nuclear Regulatory Commission (NRC) completed a Problem Identification and Resolution inspection at your Sequoyah Nuclear Power Plant, Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on June 27, 2013, with Mr. J.T. Carlin and other members of your staff.

The inspection was an examination of activities conducted under your license as they relate to the identification and resolution of problems, and compliance with the Commission's rules and regulations and with the conditions of your operating license. Within these areas, the inspection involved examination of selected procedures and representative records, observations of plant equipment and activities, and interviews with personnel.

Based on the inspection sample, the inspection team concluded that the implementation of the corrective action program and overall performance related to identifying, evaluating, and resolving problems at Sequoyah Nuclear Power Plant Units 1 and 2 was adequate. Licensee identified problems were entered into the corrective action program at a low threshold. Problems were generally prioritized and evaluated commensurate with the safety significance of the problems. Corrective actions were generally implemented in a timely manner commensurate with their importance to safety and addressed the identified causes of problems. Lessons learned from the industry operating experience were generally reviewed and applied when appropriate. Audits and self-assessments were effectively used to identify problems and appropriate actions.

No findings were identified during this inspection.

J. Shea

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Sincerely,

***/RA/***

Manuel Crespo, Acting Chief  
Reactor Projects Branch 7  
Division of Reactor Projects

Docket Nos. 50-327, 50-328  
License Nos. DPR-77, DPR-79

Enclosure: Inspection Report 05000327/2013008, 05000328/2013008  
w/Attachment: Supplemental Information

cc w/encl. (see page 3)

J. Shea

2

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J. Shea

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J. T. Carlin  
Site Vice President  
Sequoyah Nuclear Plant  
Tennessee Valley Authority  
Electronic Mail Distribution

P. R. Simmons  
Plant Manager  
Sequoyah Nuclear Plant  
Tennessee Valley Authority  
Electronic Mail Distribution

J. W. Proffitt  
Manager, Site Licensing  
Sequoyah Nuclear Plant  
Tennessee Valley Authority  
Electronic Mail Distribution

C. D. Mackaman  
Program Manager, Corporate Licensing  
Tennessee Valley Authority  
Electronic Mail Distribution

Edward J. Vigluicci  
Associate General Counsel, Nuclear  
Tennessee Valley Authority  
Electronic Mail Distribution

County Mayor  
Sequoyah  
208 Courthouse  
625 Georgia Avenue  
Chattanooga, TN 37402-2801

Tennessee Department of Environment & Conservation  
Division of Radiological Health  
401 Church Street  
Nashville, TN 37243

Senior Resident Inspector  
U.S. Nuclear Regulatory Commission  
Sequoyah Nuclear Plant  
2600 Igou Ferry Road  
Soddy Daisy, TN 37379-3624

Ann Harris  
341 Swing Loop  
Rockwood, TN 37854

J. Shea

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Letter to Joseph Shea from Manuel Crespo dated August 6, 2013

SUBJECT: SEQUOYAH NUCLEAR PLANT – NRC PROBLEM IDENTIFICATION AND  
RESOLUTION INSPECTION REPORT 05000327/2013008, 05000328/2013008

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos.: 50-327, 50-328

License Nos.: NPF-77, NPF-79

Report Nos.: 05000327/2013008, 05000328/2013008

Licensee: Tennessee Valley Authority (TVA)

Facility: Sequoyah Nuclear Plant, Units 1 and 2

Location: Sequoyah Access Road  
Soddy-Daisy, TN 37379

Dates: June 10 – 14, 2013  
June 24 – 27, 2013

Inspectors: N. Staples, Senior Project Inspector, Team Leader  
R. Taylor, Senior Project Inspector  
M. Coursey, Reactor Inspector  
J. Dymek, Reactor Inspector

Approved by: M. Crespo, Acting Chief  
Reactor Projects Branch 7  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000327/2013008, 05000328/2013008; 06/10/2013 – 06/27/2013; Sequoyah Nuclear Plant, Units 1 and 2; biennial inspection of the identification and resolution of problems.

The inspection was conducted by two senior project inspectors and two reactor inspectors. No findings were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Rev. 4.

### Identification and Resolution of Problems

The inspectors concluded that, in general, problems were properly identified, evaluated, prioritized, and corrected. The licensee was effective at identifying problems and entering them into the corrective action program (CAP) for resolution, as evidenced by the relatively few number of deficiencies identified by external organizations (including the NRC) that had not been previously identified by the licensee, during the review period. Generally, prioritization and evaluation of issues were adequate, formal root cause evaluations for significant problems were adequate, and corrective actions specified for problems were acceptable. Overall, corrective actions developed and implemented for issues were generally effective and implemented in a timely manner.

The inspectors determined that overall, audits and self-assessments were adequate in identifying deficiencies and areas for improvement in the CAP, and appropriate corrective actions were developed to address the issues identified. Operating experience usage was found to be generally acceptable and integrated into the licensee's processes for performing and managing work, and plant operations.

Based on discussions and interviews conducted with plant employees from various departments, the inspectors determined that personnel at the site felt free to raise safety concerns to management and use the CAP to resolve those concerns.

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## REPORT DETAILS

### 4. OTHER ACTIVITIES

#### 4OA2 Problem Identification and Resolution

##### a. Assessment of the Corrective Action Program

##### (1) Inspection Scope

The inspectors reviewed the licensee's corrective action program (CAP) procedures which described the administrative process for initiating and resolving problems primarily through the use of problem evaluation reports (PERs). To verify that problems were properly identified, appropriately characterized and entered into the CAP, the inspectors reviewed PERs that were issued between August 2011 and May 2013, including a detailed review of selected PERs associated with the following risk-significant systems: Reactor Coolant, Auxiliary Feedwater and Component Cooling. Where possible, the inspectors independently verified that the corrective actions were implemented. The inspectors also reviewed selected common causes and generic concerns associated with root cause evaluations to determine if they had been appropriately addressed. To help ensure that samples were reviewed across all cornerstones of safety identified in the NRC's Reactor Oversight Process, the inspectors selected a representative number of PERs that were identified and assigned to the major plant departments, including operations, maintenance, engineering, health physics, chemistry, and security. The inspectors reviewed selected PERs, verified corrective actions were implemented, and attended meetings where PERs were screened for significance to determine whether the licensee was identifying, accurately characterizing, and entering problems into the CAP at an appropriate threshold.

The inspectors conducted plant walkdowns of equipment to assess the material condition and to identify any deficiencies that had not been previously entered into the CAP. The inspectors reviewed PERs, maintenance history, completed work orders for the systems, and reviewed associated system health reports. These reviews were performed to verify that problems were being properly identified, appropriately characterized, and entered into the CAP. Items reviewed generally covered a two-year period; however, in accordance with the inspection procedure, a five-year review was performed for selected systems for age-dependent issues.

Control room reviews were also performed to assess the Main Control Room deficiency list and to ascertain if deficiencies were entered into the CAP. The inspectors reviewed Operator Workarounds and Operator Burden screenings and verified compensatory measures were implemented for deficient equipment.

The inspectors conducted a detailed review of selected PERs to assess the adequacy of the root-cause and apparent-cause evaluations of the problems identified. The inspectors reviewed these evaluations against the descriptions of the problem described in the PERs and the guidance in licensee procedures NPG-SPP-03.1, Corrective Action

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Program, NPG-SPP-03.1.5, Apparent Cause Evaluations, and NPG-SPP-03.1.6, Root Cause Analysis. The inspectors assessed if the licensee had adequately determined the causes of identified problems, and had adequately addressed operability, reportability, common cause, generic concerns, extent-of-condition, and extent-of-cause. The review also assessed if the licensee had appropriately identified and prioritized corrective actions to prevent recurrence for significant conditions adverse to quality.

The inspectors attended various plant meetings to observe management oversight functions of the corrective action process. These included PER screening meetings and Corrective Action Review Board.

Documents reviewed are listed in the Attachment.

(2) Assessment

Identification of Issues

The inspectors determined that the licensee was generally effective in identifying problems and entering them into the CAP and there was a low threshold for entering issues into the CAP. Site management was actively involved in the CAP and focused appropriate attention on significant plant issues.

In the area of trending, the inspection team made several observations. The inspection team noted that fleet procedure NPG-SPP-02.7, PER Trending, did not give specific thresholds for the identification of negative trends. In addition, CAP trend codes were not applied and utilized at the equipment level. The team also noted that out of approximately 500+ trending codes, only a small fraction of codes were utilized, with codes being utilized differently amongst departments. The licensee issued PER 747130 to address these observations.

Prioritization and Evaluation of Issues

Based on the review of PERs sampled by the inspection team during the onsite period, the inspectors concluded that problems were generally prioritized and evaluated in accordance with the licensee's CAP procedures. Each PER was assigned a significance level by certified members during the PER Screening Committee meeting.

The inspectors determined that station personnel had conducted root cause and apparent cause analyses in compliance with the licensee's CAP procedures. The assigned cause determinations were appropriate and considered the significance of the issues being evaluated. A variety of formal causal-analysis techniques were used depending on the type and complexity of the issue consistent with NPG-SPP-03.1, Corrective Action Program.

### Effectiveness of Corrective Actions

The inspectors determined that, overall, corrective actions were timely, commensurate with the safety significance of the issues, and effective in that conditions adverse to quality were corrected and non-recurring. For significant conditions adverse to quality, the corrective actions directly addressed the cause and effectively prevented recurrence. Effectiveness reviews for corrective actions to prevent recurrence were sufficient to ensure corrective actions were properly implemented and were effective.

(3) Findings

No findings were identified.

b. Assessment of the Use of Operating Experience (OE)

(1) Inspection Scope

The inspectors examined licensee program for reviewing industry OE, reviewed licensee procedure NPG-SPP-02.3, Operating Experience Program, and reviewed the licensee's OE database to assess the effectiveness of how external and internal OE data was handled at the plant. In addition, the inspectors selected operating experience documents (e.g., NRC generic communications, 10 CFR Part 21 reports, licensee event reports, vendor notifications, and plant internal OE items, etc.) issued since August 2011, to verify if the licensee had appropriately evaluated each notification for applicability and if issues identified through these reviews were entered into the CAP. Documents reviewed are listed in the Attachment.

(2) Assessment

The inspectors determined that the licensee was generally effective in screening operating experience for applicability to the plant. Industry OE was evaluated by plant OE Coordinators and relevant information was then forwarded to the applicable department for further action or informational purposes. OE issues requiring action were entered into the CAP for tracking and closure. In addition, OE was included in all root cause evaluations in accordance with licensee procedures.

(3) Findings

No findings were identified.

c. Assessment of Self-Assessments and Audits

(1) Inspection Scope

The inspectors reviewed audit reports and self-assessment reports, including those which focused on problem identification and resolution, to assess the thoroughness and self-criticism of the licensee's audits and self assessments, and to verify that problems

identified through those activities were appropriately prioritized and entered into the CAP for resolution in accordance with licensee procedure NPG-SPP-02.1, NPG Self-Assessment and Benchmarking Program.

(2) Assessment

The inspectors determined that the scopes of assessments and audits were adequate. Self-assessments were generally detailed and critical. The inspectors verified that PERs were created to document all areas for improvement and findings resulting from the self-assessments, and verified that actions had been completed consistent with those recommendations. Generally, the licensee performed evaluations that were technically accurate.

(3) Findings

No findings were identified.

c. Assessment of Safety-Conscious Work Environment

(1) Inspection Scope

The inspectors randomly interviewed several on-site workers regarding their knowledge of the CAP and their willingness to write PERs or raise safety concerns. During technical discussions with members of the plant staff, the inspectors also conducted interviews to develop a general perspective of the safety-conscious work environment. The interviews were also conducted to determine if any conditions existed that would cause employees to be reluctant to raise safety concerns. The inspectors reviewed the licensee's Employee Concerns Program (ECP) and interviewed the ECP manager. Additionally, the inspectors reviewed a sample of ECP issues to verify that concerns were properly reviewed and identified deficiencies were resolved and entered into the CAP when appropriate.

(2) Assessment

The inspectors determined that licensee management emphasized the need for all employees to identify and report problems using the appropriate methods established within the administrative programs, including the CAP and ECP. These methods were readily accessible to all employees. The inspectors determined that employees felt free to raise issues, and that management encouraged employees to place issues into the CAP for resolution.

The inspectors did not identify any reluctance on the part of the licensee staff to report safety concerns.

(3) Findings

No findings were identified.

4OA6 Meetings, Including Exit

On June 27, 2013, the inspectors presented the inspection results to Mr. Carlin and other members of the site staff. The inspectors confirmed that all proprietary information examined during the inspection had been returned to the licensee.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee personnel:

G. Franceschi, Performance Improvement Manager  
J. McCamy, Quality Assurance Manager  
J. Cross, Chemistry Manager  
G. Yelliot, Employee Concerns Manager  
M. Baker-Lindsay, QA Sr. Program Manager  
S. Tuthill, QA Program Manager  
M. McBrearty, Licensing Manager  
M. Tipton, Performance Improvement  
M. Woods, Performance Improvement

#### NRC personnel:

S. Shaeffer Chief, Branch 6, Division of Reactor Projects

### **LIST OF ITEMS OPEN, CLOSED AND DISCUSSED**

#### Open

None

#### Closed

None

#### Discussed

None

### **LIST OF DOCUMENTS REVIEWED**

#### Procedures

NPG-SPP-01.7.1, Employee Concerns Program, Rev. 0  
NPG-SPP-01.14, Service Request Initiation, Rev. 3  
NPG-SPP-02.1, NPG Self-Assessment and Benchmarking Program, Rev. 1  
NPG-SPP-02.3, Operating Experience Program, Rev. 5  
NPG-SPP-03.1, Corrective Action Program, Rev. 6  
NPG-SPP-03.1.4, Corrective Action Program Screening and Oversight, Rev. 13  
NPG-SPP-03.1.5, Apparent Cause Evaluations, Rev.8  
NPG-SPP-03.1.6, Root Cause Analysis, Rev.7  
NPG-SPP-03.1.7, PER Analysis, Actions, Closures and Approvals, Rev. 12  
NPG-SPP-03.1.10, PER Effectiveness Reviews, Rev.4  
NPG-SPP-09.16.1, System, Component and Program Health, Rev.2  
TVA-SPP-11.8.4, Expressing Concerns and Differing Views, Rev. 7

Problem Evaluation Report (PERs)

324757	678982	603442	626982
439874	681589	604614	668367
485817	682505	636215	677901
495846	685760	648588	684348
500134	687344	648645	685293
513378	688379	665633	687986
519536	689299	676735	692691
529757	696397	687984	705557
530366	413708	696410	713646
542926	423008	699690	481696
549327	424030	708758	592377
558302	485870	423161	565884
558421	501291	429823	712676
562450	519502	449695	435347
566987	519506	465177	585066
567131	586764	471349	562473
576921	589670	476739	560211
589672	596687	501210	559037
589674	568242	512798	569843
609594	568248	520311	551613
617910	162189	527246	501256
631348	479074	529759	499166
637101	503163	542657	490146
655628	527875	553044	535471
687981	687959	581660	505811
687982	470310	586627	506103
706750	596978	446418	723603
706883	652681	602174	526631
716741	666536	630028	585045
432510	686710	713825	604936
445212	415324	419705	465168
448086	433743	437068	712018
471856	473286	470310	617492
498255	475051	479080	419705
512736	490835	424434	637942
517889	505606	426628	619283
527850	511690	431972	617263
538996	516499	461767	599711
555163	516840	466317	583576
585094	518647	474311	567131
624871	556013	504875	561188
630078	559037	506338	722403
635934	562957	514780	718771
635937	569844	573707	264267
649975	571505	585329	262955
652672	577556	597135	233938
653890	585970	622595	466320

### Root Cause Analysis Reports

Root Cause Analysis Report (RCAR) for PER 470310, Turbine Driven Auxiliary Feedwater Pump Inoperable Due To Overspeed Trip, dated February 3, 2012  
 RCAR for PER 596978, Failure of Unit 2 RCP 4 50G Relay, dated 09/25/12  
 RCAR for PER 652681, Inadvertent RCS Water Movement Due to Inadequate Hold Order, dated 01/14/13  
 RCAR for PER 666536, Materials Left In Unit 2 Containment Without Proper Documentation, dated 2/20/13  
 RCAR for PER 686710, Unit 2 Manual Trip for Failed Condenser B Pressure Indicator, dated 04/11/2013

### Apparent Cause Evaluations

Apparent Cause Evaluation (ACE) Report for PER 415324, Incorrect Connection of Test Equipment Causes a Short in 125 VDC Circuit, not dated  
 ACE for PER 433743, Automatic Scram due to Failure of EHC to Switch to Alternate Power Supply During Transient, dated October 26, 2011  
 ACE for PER 434730, 6.9 kV Shutdown Control Board Failures, not dated  
 ACE for PER 505606, Testing Frequency for FCV-63-47 Did Not Conform to ASME OM Code Requirement, dated March 14, 2012  
 ACE for PER 511690, Adverse Carbon Brush Wear on CCW Pump Motors, dated 3/24/2012  
 ACE for PER 516499, Investigation of Degraded Motors, dated 04/25/2012  
 ACE for PER 516840, Investigation of Missing Motor Pinion Key in 1-FCV-074-0021-B, dated 03/29/2012  
 ACE for PER 518647, Failure of Trip Logic on Main Turbine, dated April 12, 2012  
 ACE for PER 556013, Unplanned Unit 1 Outage to Repair Seal Oil Cooler Leak dated 05/21/2012  
 ACE for PER 562957, 6.9 kV Shutdown Board Room Chiller Pump Thermal Overload Undersized, dated 7/10/2012  
 ACE for PER 569844, Governor Valve LVDT Rod Assembly, dated 08/08/12  
 ACE for PER 571505, 1A CCP Room Cooler Leak, dated 7/23/2012  
 ACE for PER 577556, Repeat Failure of Motor Contactor on 2B Incore Instrument Room Chiller, dated 08/09/12  
 ACE for PER 585086, Unqualified Engineering Personnel Performing Tasks, dated 09/20/12  
 ACE for PER 586970, Emergency Diesel Generator 1A-A Voltage Control Rheostat Failure, dated 8/28/12  
 ACE for PER 603442, Coating Inspection Results Not Evaluated by Engineering per G-55 (SSA 1209), dated 01/31/2013  
 ACE for PER 604614, Cable Bags in Containment Unit 2, dated 10/04/12  
 ACE for PER 636215, Potential Green NCV identified during the U2R18 ISI Inspection, dated 12/13/2012  
 ACE for PER 648588, Radiation Area Not Posted on U2 Dome, dated 1/3/13  
 ACE for PER 640236, Gaps in FME Control SR 640236, dated 12/12/12  
 ACE for PER 665633, Implementation of SQN Plant Freeze Protection, dated 02/08/2013  
 ACE for PER 676735, Adverse Trend with FME Level 2 System Breaches, dated 02/04/13  
 ACE for PER 696410, Deficiencies with Containers of Radioactive Material, dated March 15, 2013

ACE for PER 699690, High Leak Rates for Containment Electrical Penetration Assemblies, dated 4/18/13

ACE for PER 708758, Vital Battery Charger I Breaker Tripped, dated 05/09/13

PERS Written As a Result Of This Inspection

747212, High number of PERs are trended using the event code DC-OT

739544, NRC identified that the date in the CAP for PER 581660 read 23-13-2013

746542, NRC PI&R Inspection identified GAP between Program Health Report and Procedure

747130, PER Trending does not provide guidance for establishing threshold driven actions

747196, SCWE Training for Staff

Work Orders Reviewed

WO 112623771

WO 112636762

WO 113169052

WO 113736864

WO 113422443

System / Program Health Reports

Program Health Report, Appendix "R", 7/1/12 – 12/31/12

System Health Report, System No. 13-Fire Detection, 10/31/12 – 1/31/13

System Health Report, System No. 26-High Pressure Fire Protection, 10/31/12 – 1/31/13

System Health Report, System No. 39-CO2, 10/31/12 – 1/31/13

System Health Report, System No. 70-Component Cooling, 10/31/12 – 1/31/13

System Health Report, Essential Raw Cooling Water System, dated 10/1/2011 – 01/31/2012

Assessment Reports Reviewed

Sequoyah Quality Assurance (QA) Fire Operations Assessment, QA-SQ12-010

TVA Quality Assurance Nuclear Power Group (NPG) Sequoyah Nuclear Plant, Fire Protection, Audit Report SSA1214

Drawings Reviewed

Mechanical Flow Diagram Component Cooling System, 1,2-47W859-1, Rev. 54

Other

Cause Evaluation Handbook, Rev. 4

Safety Conscious Work Environment -The Practical Guide for Leaders, 2009

Safety Conscious Work Environment -Practical Pointers for the Individual Contributor, 2009

Level Escalation Letter, Response to Corporate Oversight, "NFPA Sprinkler Upgrade" from T.

Noe to S. Harvey, 3/12/13

Significant Issue Gap Analysis Report for PERs 687984 and 636215, not dated

Unit 2 Reactor Trip Report for PER 686710, Event Date 2/24/2013

1A CCS HX Fouling History Graph, 1999-2013

1B CCS HX Fouling History Graph, 1999-2013

2A CCS HX Fouling History Graph, 1999-2013