Tennessee Valley Authority, Post Office Box 2000, Soddy Daisy, Tennessee 37384-2000

January 25, 2010

10 CFR 50.73

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Sequoyah Nuclear Plant, Unit 2
Facility Operating License No. DPR-79
NRC Docket No. 50-328

Subject: **Licensee Event Report 328/2009-002, "Manual Reactor Trip Because of Degrading Main Feedwater Pump Turbine Condenser Vacuum"**

The enclosed licensee event report provides details concerning a manual reactor trip and automatic engineered safety feature actuation of the auxiliary feedwater system. The manual reactor trip was initiated because of degrading main feedwater pump turbine condenser vacuum. This report is being submitted in accordance with 10 CFR 50.73(a)(2)(iv)(A), a condition that resulted in an manual actuation of the reactor protection system.

Respectfully,

Christopher R. Church
Site Vice President
Sequoyah Nuclear Plant

Enclosure:

cc: NRC Regional Administrator – Region II
NRC Senior Resident Inspector – Sequoyah Nuclear Plant

IE22
NRR

NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 08/31/2010
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)	Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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4. TITLE: Manual Reactor Trip because of Degrading Main Feedwater Pump Turbine Condenser Vacuum

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	26	2009	2009	- 002 -	00	01	25	2010	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE: 1

10. POWER LEVEL: 30

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A
☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
Donald Sutton	423-843-6539

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO				

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On November 26, 2009, at 0242 Eastern standard time (EST), SQN Unit 2 reactor was manually tripped following indication of degrading main feedwater pump turbine (MFPT) condenser vacuum. At approximately 0239 EST, the shift manager was notified of a degrading vacuum in the 2A MFPT condenser. Operations manually tripped the reactor and entered the applicable emergency procedures. The cause of this event was determined to be the closure of two isolation valves for a level switch on the gland seal steam system that trapped water in the level switch and indicated a high gland steam level. With the level switch actuated, two associated gland seal steam drain valves failed open and allowed gland seal steam to be directly routed to the drain lines of the MFPT condenser. This allowed steam to be injected into the drain flow from the 2A MFPT and created a restricted flow condition because of the steam bound environment and subsequently challenged the drain capability of the 2A MFPT condenser. The root cause of this event was determined to be a deficiency in enforcing proper standards for status control during work development and execution. Corrective actions include revising the work control process procedure to strengthen status control requirements and additional training regarding status control for selected plant personnel.

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17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

I. PLANT CONDITION(S)

Unit 2 was operating at approximately 30 percent power during power ascension following the Unit 2 Cycle 16 refueling outage.

II. DESCRIPTION OF EVENT

A. Event:

On November 26, 2009, at 0242 Eastern standard time (EST), SQN Unit 2 reactor was manually tripped following an indication of degrading main feedwater pump turbine (MFPT) condenser [EIIS Code SG] vacuum. At approximately 0239 EST, the shift manager was notified of indications of a degrading vacuum in the 2A MFPT condenser. At approximately 0242, the 2A MFPT condenser indicated positive pressure with a corresponding condensate saturation temperature. Based on indications of positive pressure in the 2A MFPT condenser and degrading vacuum in the 2B MFPT condenser, a reactor trip was directed by the shift manager. Operations personnel entered the applicable emergency procedures.

B. Inoperable Structures, Components, or Systems that Contributed to the Event:

None.

C. Dates and Approximate Times of Major Occurrences:

Date	Description
November 26, 2009, at 0239 EST	The Operations shift manager was notified of indications of degrading vacuum in the 2A MFPT condenser. This condition was followed by indications of a degrading vacuum in the 2B MFPT condenser.
November 26, 2009, at 0242 EST	Operations initiated a manual reactor trip and entered emergency operation procedures.

D. Other Systems or Secondary Functions Affected:

No other systems or secondary functions were affected by this event.

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17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

E. Method of Discovery:

On November 26, 2009, at approximately 0239 EST, the Operations unit supervisor notified the shift manager of degrading vacuum in the 2A MFPT condenser.

F. Operator Actions:

Based on a positive pressure in the 2A MFPT condenser and a degrading vacuum in the 2B MFPT condenser, a reactor trip was directed by the shift manager.

G. Safety System Responses:

The safety systems performed as designed for the reactor trip. Auxiliary feedwater [EIIS Code BA] automatically initiated following the reactor trip. At approximately seven minutes after the trip, flow was reduced to mitigate the decrease in reactor coolant system average temperature and recover steam generator levels. All safety systems remained within technical specifications (TS) and Updated Final Safety Analysis Report (UFSAR) limits.

III. CAUSE OF THE EVENT

A. Immediate Cause:

The immediate cause of this event was failure to properly implement procedure use and adherence. This resulted in an incorrect valve configuration for the gland seal steam level switch.

B. Root Cause:

The root cause of this event was determined to be a deficiency in enforcing proper standards for status control during work package development and execution. A technically inaccurate preventative maintenance procedure caused a valve configuration control problem with the associated work package. If proper standards concerning status control had been understood and executed during work package development and execution, the procedure would have been corrected and the event would not have occurred.

C. Contributing Factor:

Plant personnel failed to utilize proper procedure use and adherence fundamentals.

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17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

IV. ANALYSIS OF THE EVENT

Unit 2 was operating in Mode 1 at approximately 30 percent power during power ascension following the Unit 2 Cycle 16 refueling outage. Prior to the event, the reactor coolant system (RCS) [EIIS Code AB] pressure was approximately 2235 pounds per square inch gauge (psig). Following the reactor trip, RCS pressure rapidly decreased because of the decreasing RCS average temperature and the associated shrinking of coolant volume. The minimum RCS pressure following the trip was approximately 2168 psig, which is well above the pressure that would have initiated a safety injection signal. The RCS temperature following the trip remained within TS limits. The minimum pressurizer level following the reactor trip was approximately 19 percent, above the level of the pressurizer heaters. The plant response was expected because of the low initial power level and low decay heat as the plant was in power ascension from a refueling outage. No TS limits were exceeded and the UFSAR analysis of this event remained bounding.

V. ASSESSMENT OF SAFETY CONSEQUENCES

Based on the above "Analysis of The Event," this event did not adversely affect the health and safety of plant personnel or the general public.

VI. CORRECTIVE ACTIONS

A. Immediate Corrective Actions:

Corrective actions included opening the two closed isolation valves for the level switch on the gland seal steam system and performing an extent of condition walkdown of valves on selected systems to verify proper valve positioning.

B. Corrective Actions to Prevent Recurrence: The corrective actions are being managed by the Sequoyah Nuclear Plant Corrective Action Program.

Revise the procedure that governs status control to strengthen requirements such that planning and the review process assures that status control is adhered to in work packages. Develop and implement additional personnel training for procedures that govern work package development and expectations regarding status control.

LICENSEE EVENT REPORT (LER)

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17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

VII. ADDITIONAL INFORMATION

A. Failed Components:

None.

B. Previous LERs on Similar Events:

A review of previous reportable events within the last three years did not identify any previous similar events.

C. Additional Information:

None.

D. Safety System Functional Failure:

This event did not result in a safety system functional failure in accordance with 10 CFR 50.73(a)(2)(v).

E. Unplanned Scram with Complications:

This condition did not result in an unplanned scram with complications.

VIII. COMMITMENTS

None.