



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

December 24, 2009

10 CFR 50.73

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

Sequoyah Nuclear Plant, Units 1 and 2
Facility Operating License Nos. DPR-77 and DPR-79
NRC Docket Nos. 50-327 and 50-328

Subject: **Licensee Event Report 327 and 328/2009-008, "Fuel assemblies in Spent Fuel Pool not stored in conformance with Technical Specifications"**

The enclosed LER provides details concerning an event where Sequoyah Nuclear Plant arranged fuel assemblies in the spent fuel pool in a configuration that was not allowed by the design features specified in technical specifications. This report is being submitted in accordance with 10 CFR 50.73(a)(2)(i)(B), as an event that was prohibited by the plant's technical specification requirements.

TVA is currently completing the root cause evaluation. Once the evaluation is completed, TVA will supplement this report by January 28, 2010.

Respectfully,

Christopher R. Church
Site Vice President
Sequoyah Nuclear Plant

Enclosure:

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

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BAW:JWP:NRT:SKD

Enclosure

bcc (Enclosure):

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LICENSEE EVENT REPORT (LER)

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Sequoyah Nuclear Plant (SQN) Unit 1	05000327	YEAR	SEQUENTIAL NUMBER	REVISION	2 OF 6
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17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

I. PLANT CONDITION(S)

Units 1 and 2 was operating at 100 percent power.

II. DESCRIPTION OF EVENT

A. Event:

On October 28, 2009, at 1708 Eastern daylight time (EDT), while reviewing the spent fuel pool (SFP) (EIS code ND) configuration in preparation for Unit 2 Cycle 16 (U2C16) core offload, SQN determined that four fuel assemblies were in locations not in conformance with the criticality control requirements of Technical Specifications (TS) 5.6.1.1.c. The TS 5.6.1.1.c requirements ensure an arrangement of fuel in the SFP that maintains criticality within an acceptable and analyzed range. These fuel assemblies had been placed in this improper configuration during fuel moves on October 1 and October 7, 2009. Fuel movements are planned and performed to arrange the SFP fuel assemblies in a configuration that disperses the thermal energy in the SFP to minimize the potential impacts of specific events at a nuclear power plant. The October 2009 fuel assembly arrangement design should have incorporated both event-related configuration requirements and the TS 5.6.1.1.c configuration requirements. However, four fuel assemblies were incorrectly placed adjacent to fresh fuel assemblies, which was not in compliance with TS 5.6.1.1.c requirements. Following the discovery of the mis-configuration on October 28, 2009, the SFP boron concentration was verified to be within limits. The SFP boron concentration was verified at least once per 72 hours until the assemblies were moved to comply with TS 5.6.1.1.c in accordance with Surveillance Requirement (SR) 4.7.13.2. In addition, the configuration of the SFP with the four discrepant assembly locations was evaluated for safety significance. An analysis of the SFP array determined that significant margin to criticality existed and that the incorrect configuration was bounded by the limiting accident analysis. A revised SFP fuel assembly design was initiated and the required fuel moves were performed in order to return the SFP to an allowable configuration on October 31, 2009.

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

None.

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C. Dates and Approximate Times of Major Occurrences:

Date	Description
September 22 - 29, 2009	The fuel assembly transfer forms (FATFs) prepared for SFP reconfiguration did not correctly incorporate the TS 5.6.1.1.c criticality requirements for four fuel assemblies.
October 1, 2009, at 0919, 1106, 1150 EDT	Three fuel assemblies were moved to locations that were not in compliance with TS 5.6.1.1.c.
October 7, 2009, at 0900 EDT	One fuel assembly was moved to a location that was not in compliance with TS 5.6.1.1.c.
October 28, 2009, at 1708 EDT	During preparation of offload FATFs for the U2C16 outage, it was discovered that four assemblies in the SFP were not in compliance with TS 5.6.1.1.c.
October 28, 2009, at 1730 EDT	In order to comply with SR 4.7.13.2, the SFP boron concentration was verified to be greater than 2000 parts per million (ppm) and within limits at least once per 72 hours until the assemblies were moved to comply with TS 5.6.1.1.c.
October 31, 2009, at 0254 EDT	The four fuel bundles in question were relocated to appropriate storage locations on October 31, 2009.

D. Other Systems or Secondary Functions Affected:

No other systems or secondary functions were affected.

E. Method of Discovery:

On October 28, 2009, at 1708 EDT, while preparing the fuel offload SFP design arrangement for the U2C16 core offload, four fuel assemblies were found not in their correct configuration to meet the criticality requirements of TS 5.6.1.1.c.

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F. Operator Actions:

Following the discovery of the mis-configuration on October 28, 2009, the SFP boron concentration was verified to be greater than 2000 ppm and within limits at least once per 72 hours in accordance with SR 4.7.13.2.

G. Safety System Responses:

No safety system response was required.

III. CAUSE OF THE EVENT

A. Immediate Cause:

The cause of the event was the inadequate criticality review of the SFP fuel assembly design arrangement.

B. Root Cause:

The root cause of this event is being evaluated and will be provided in the supplement to this LER.

C. Contributing Factor:

The contributing factor is being evaluated and will be provided in the supplement to this LER.

IV. ANALYSIS OF THE EVENT

Unit 1 and Unit 2 were operating in mode 1 at 100 percent power when the mis-configuration of the four fuel assemblies occurred. Once the mis-configuration was discovered, the SFP boron concentration was verified to be 2274 ppm, which is greater than the 2000 ppm required by TS 3.7.13. The SFP was verified greater than 2000 ppm at least once per 72 hours to comply with SR 4.7.13.2. An analysis of the SFP arrangement determined that significant margin to criticality existed and that the incorrect configuration was bounded by the limiting accident analysis. During the period of time the four fuel assemblies were mis-configured, the SFP boron concentration was greater than 2000 ppm, which is significantly higher than the analysis requirements of greater than 700 ppm. A revised SFP fuel assembly design was initiated and the required fuel moves were performed in order to return the SFP arrangement to compliance with TS 5.6.1.1.c.

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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 revising the SFP fuel assembly design and performing the required fuel assembly moves in order to return the SFP arrangement to compliance with TS 5.6.1.1.c.

B. Corrective Actions to Prevent Recurrence:

Corrective actions to prevent recurrence are being developed to address the root cause and will be provided in the supplement to this LER.

VII. ADDITIONAL INFORMATION

A. Failed Components:

None.

B. Previous LERs on Similar Events:

A review of previous reportable events for the past 10 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.

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VIII. COMMITMENTS

None.