Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

May 16, 2013

10 CFR 50.54(f)

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
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: **Sequoyah Nuclear Plant, Units 1 and 2 - Path Forward for Resolution of Generic Safety Issue (GSI)-191**

References:

1. Nuclear Energy Institute (NEI) letter to NRC, Office of Nuclear Reactor Regulation, Director, Division of Safety Systems, "GSI-191 - Current Status and Recommended Actions for Closure," dated May 4, 2012
2. NEI letter to NRC, Office of Nuclear Reactor Regulation, Director, Division of Safety Systems, "GSI-191 – Revised Schedule for Licensee Submittal of Resolution Path," dated November 15, 2012.
3. SECY-12-0093, "Closure Options for Generic Safety Issue - 191, Assessment of Debris Accumulation on Pressurized-Water Reactor Sump Performance," dated July 9, 2012.
4. Pressurized Water Reactor Owners Group (PWROG), Topical Report (TR) WCAP-16793-NP, Revision 2, "Evaluation of Long-Term Core Cooling Considering Particulate Fibrous and Chemical Debris in the Recirculating Fluid," dated October 12, 2011.
5. NRC Staff Requirements – SECY-12-0093, "Closure Options for Generic Safety Issue - 191, Assessment of Debris Accumulation on Pressurized-Water Reactor Sump Performance," dated December 14, 2012.
6. NRC Final Safety Evaluation for Pressurized Water Reactor Owners Group Topical Report WCAP-16793-NP, Revision 2, "Evaluation of Long-Term Cooling Considering Particulate Fibrous and Chemical Debris in the Recirculating Fluid," dated April 8, 2013.

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7. NRC letter to NEI, ""NRC Review of Nuclear Energy Institute Clean Plant Acceptance Criteria for Emergency Core Cooling Systems," dated May 2, 2012.

In a letter dated May 4, 2012 (Reference 1), the Nuclear Energy Institute (NEI) described the status of industry efforts to resolve Generic Safety Issue (GSI)-191, "PWR Sump Performance" and recommended actions to close the issue. NEI's Reference 1 recommendations were based on licensees providing a docketed submittal to NRC by December 31, 2012 that would outline a GSI-191 resolution path.

In a subsequent letter dated November 15, 2012 (Reference 2), NEI recommended to the NRC that licensees delay submittal of GSI-191 resolution path and schedule until January 31, 2013, or 30 days following both the Commission response to SECY 12-0093 (Reference 3) and the final NRC safety evaluation (SE) on WCAP-16793 (Reference 4) being made publicly available. This schedule was requested to allow time for licensees to appropriately address Commission direction contained in the Staff Requirements Memorandum (SRM) on SECY 12-0093 and staff decisions contained in the SE on WCAP-16793 .

In its SRM on SECY 12-0093 (Reference 5), the Commission approved the staff's recommendation to allow licensees the flexibility to choose any of the three options discussed in the paper to resolve GSI-191. Subsequently, on April 16, 2013, the SE for WCAP-16793 was made publicly available (Reference 6).

TVA's approach to resolving GSI-191 is to use the Option 1 with "clean-plant" criteria approach described in SECY-12-0093 (i.e.; Compliance with 10 CFR 50.46 Based on Approved Models) and NRC letter to NEI dated May 2, 2012 (Reference 7). Enclosure 1 to this letter includes information regarding TVA's planned approach for Sequoyah Nuclear Plant, Units 1 and 2, including resolution path forward and schedule for resolution, summary of actions completed for GL 2004-02, and defense-in-depth and mitigation measures which have been established and will be maintained throughout the resolution period.

Enclosure 2 provides a list of commitments made in this submittal.

If you have any questions concerning this submittal, please contact Russell Thompson at (423) 751-2567.

I declare under penalty of perjury that the foregoing is true and accurate. Executed on this 16th day of May, 2013.

Respectfully,

J. W. Shea
Vice President, Nuclear Licensing

Enclosures
cc: See Page 3

Enclosures

1. GSI-191 Path Forward, Sequoyah Nuclear Plant, Units 1 and 2
2. List of Commitments

cc (Enclosures):
NRC Regional Administrator – Region II

Enclosure 1

GSI-191 Path Forward

Sequoyah Nuclear Plant, Units 1 and 2

Enclosure 1
GSI-191 Path Forward
Sequoyah Nuclear Plant, Units 1 and 2

Introduction

The purpose of this Enclosure is to describe the Tennessee Valley Authority's (TVA) plans to complete the remaining action associated with the evaluation of the potential for debris entrained in the circulated containment pool, following a loss-of-coolant accident, to block restrictions within the Emergency Core Cooling System (ECCS) recirculation flow path, including blockage within the reactor fuel assemblies, as requested by Generic Letter (GL) 2004-02 for Sequoyah Nuclear Plant (SQN), Units 1 and 2.

To complete the required action, TVA will demonstrate compliance with 10 CFR 50.46 through the use of approved models for analyses, strainer head loss testing, and in-vessel effects. TVA's plan uses Option 1 with "clean-plant" criteria for completion of Generic Safety Issue -191 as described in SECY-12- 0093, "Closure Options for Generic Safety Issue - 191, Assessment of Debris Accumulation on Pressurized-Water Reactor Sump Performance," dated July 9, 2012 and NRC letter to NEI, "NRC Review of Nuclear Energy Institute Clean Plant Acceptance Criteria for Emergency Core Cooling Systems," dated May 2, 2012.

Current Resolution Status

On September 13, 2004, the NRC issued GL 2004-02. GL 2004-02 requested that each plant perform an evaluation of the ECCS and Containment Spray System (CS) recirculation functions based on the information provided in the Generic Letter, and, if appropriate, take additional actions to ensure system function.

TVA submitted its initial response to the GL for SQN, Units 1 and 2 by letter dated March 7, 2005. TVA's latest response for SQN, Units 1 and 2, regarding GL 2004-02 was submitted on June 2, 2011. Additional correspondence for SQN, Units 1 and 2 was submitted on July 21, 2005, September 1 and September 30, 2005, April 11, 2006, December 21, 2006, November 28, 2007, February 29, 2008, February 23, 2009 and April 1, 2010.

As discussed in one or more of these submittals, TVA has completed the following GL 2004-02 actions, analyses and modifications for SQN, Units 1 and 2:

- Latent debris walkdowns and analysis;
  - (Described as completed in letter from TVA to NRC dated February 29, 2008)
- Debris generation analysis;
  - (Described as completed in letter from TVA to NRC dated February 29, 2008)
- Debris transport analysis;
  - (Described as completed in letter from TVA to NRC dated February 29, 2008)
- Hydraulic analysis of the ECCS and CS systems (taking suction from the containment recirculation sump);
  - (Described as completed in letter from TVA to NRC dated February 29, 2008)
- Net positive suction head analysis for CS and Residual Heat Removal (RHR) pumps (taking suction from the containment recirculation sump);
  - (Described as completed in letter from TVA to NRC dated February 29, 2008)

- Head loss testing for containment recirculation sump strainers;
    - (Described in letters from TVA to NRC dated February 29, 2008, February 23, 2009, and June 2, 2011)
- Wear and blockage analysis for components downstream of containment recirculation sump strainer;
    - (Described as completed in letter from TVA to NRC dated February 29, 2008)
- Structural analysis of containment recirculation sump strainers; and
    - (Described in letters from TVA to NRC dated February 29, 2008 and February 23, 2009)
- Installation of new containment recirculation sump strainers.
    - (Described as completed in letter from TVA to NRC dated February 29, 2008)

With regard to the evaluation of in-vessel, downstream effects, by letter dated February 23, 2009, TVA committed to complete the SQN in-vessel downstream effects evaluation following issuance of the final NRC Safety Evaluation Report (SER) for Topical Report No. WCAP-16793-NP, "Evaluation of Long-Term Cooling Considering Particulate, Fibrous, and Chemical Debris in the Recirculating Fluid."

The NRC issued its final Safety Evaluation on WCAP-16793-NP, Revision 2, "Evaluation of Long-Term Cooling Considering Particulate, Fibrous, and Chemical Debris in the Recirculating Fluid" on April 8, 2013. Consequently, to appropriately address downstream in-vessel effects, SQN plans to use the criteria established by WCAP-16793 Revision 2, including any limitations associated with the use of the WCAP based on the NRC final Safety Evaluation Report. TVA will review the Safety Evaluation Report and document adherence to the Limitations and Conditions contained in Section 4.0 in the appropriate SQN and Corporate calculations and design documents.

As described in TVA's letter dated February 29, 2008, SQN has only Reflective Metallic Insulation within the polar crane walls. As a result, any fibrous material potentially transported in recirculating fluid is considered to be from latent debris quantity inside containment. The fibrous debris quantity is documented in the latent debris walkdown and debris generation analyses discussed in the February 29, 2008 letter. TVA does not foresee any issues in complying with the 15 gram/fuel assembly criterion.

Based on the SQN core design of 193 fuel assemblies, application of the 15 gram/fuel assembly would limit SQN to a total fiber of approximately 14 lbs in containment, assuming a 45% strainer bypass value. The existing latent fiber (estimated to be less than 1 lb) plus fiber debris imbedded in the ice condenser (estimated to be 1 lb) will be less than the 14 lbs allowed.

As discussed in the February 29, 2008 TVA letter, design and administrative controls are in place at SQN to ensure that potential quantities of post-accident debris are maintained within the bounds of the analyses and design bases that support ECCS and CS recirculation functions. A summary follows:

a. Surveillance Instruction 1-SI-SIN-063-009.0 and 2-SI-SIN-063-009.0, "Containment Sump Inspection" - This procedure provides detailed steps for the inspection of the RHR/containment sump. A visual inspection of the RHR/containment sump is performed once every 18 months in order to verify the suction valve inlets are not restricted by debris.

b. SQN Calculation No. SQN-SQS2-0240, "Evaluation of Debris Inside Containment" - This calculation documents the evaluation and acceptability of loose debris in the ice condenser.

c. NPG-SPP-09.17 and 0-TI-DXX-000-013.0 "Temporary Equipment Control" - These procedures delineate controls for housekeeping, material condition, and temporary equipment at TVA nuclear sites. This encompasses housekeeping responsibilities for all workers to preserve the quality of the work environment and the material condition of the plant.

d. MMDP-15, "Conduct of Maintenance - Expectations and Standards" - This maintenance and modification process ensures that conduct of maintenance activities and the physical implementation of design changes support safe operation of the station.

e. NPG-SPP-09.3, "Plant Modifications and Engineering Change Control" - This procedure establishes a uniform process of administrative controls and regulatory/quality requirements for plant modifications and changes to engineering documents. It includes consideration of materials introduced into the containment that could contribute to sump strainer blockage.

f. NPG-SPP-09.5, "Temporary Modifications" - This procedure provides the requirements for controlling temporary alterations to systems, structures, and components (SSCs) of TVA's 10 CFR 50 and 10 CFR 72 facilities in a manner which ensures operator awareness, conformance with design basis and operability requirements, and preservation of plan safety and reliability.

g. Surveillance Instruction 0-PI-OPS-000-011.0, "Containment Access Control - Modes 1-4" - This surveillance instruction provides documentation of containment entry/exit and cleanliness (housekeeping) requirement when the plant is in Modes 1 through 4. Performance ensures no loose debris (rags, trash, clothing, failed protective coatings, tools, etc.) is present in containment, specifically debris that could impact RHR, CSS, and ECCS operability due to adverse impact on the containment sump.

h. Surveillance Instruction 0-PI-OPS-000-187.0, "Containment Inspection" - This surveillance instruction provides the overall containment close-out prior to entry into Mode 4 during startup, including demonstrating good housekeeping in containment by ensuring no loose debris is present which could be transported to the containment sump and cause restriction to RHR and CSS pump suction.

i. General Engineering Specification G-55, "Technical and Programmatic Requirement for Protective Coating Program at TVA Nuclear Plant" - This engineering specification provides the technical and programmatic requirements for the protective coating programs at TVA nuclear plants.

j. Modification/Addition Instruction M&AI-5.3, "Application and Repair of Protective Coatings" - This procedure covers the technical and verification requirements to implement a protective coating program at Sequoyah which meets TVA's commitments as defined in Engineering Specification G-55.

k. Technical Instruction 0-TI-DXX-000-010.0, "Protective Coatings Program" - This technical instruction establishes organizational responsibilities and department interfaces required for implementation of the protective coating program at SQN, including requirements associated with controlling and tracking the inventory of unqualified coatings installed inside primary containment that could adversely impact containment sump operability.

Collectively, these documents provide the technical and programmatic controls necessary to ensure that design change, maintenance, and modification activities are conducted in a manner that assures operability of the containment sump with defense-in-depth and mitigation measures.

Resolution Schedule

There are no open issues related to the resolution of GSI-191, except for downstream in-vessel effects. TVA will complete the review of the Safety Evaluation Report and document adherence to the Limitations and Conditions contained in Section 4.0 in the appropriate TVA calculations and design documents and will submit the results of this effort to NRC by June 20, 2014.

The SQN Updated Final Safety Analysis Report will be updated with this information in accordance with 10CFR 50.71(e).

Enclosure 2

List of Commitments

Sequoyah Nuclear Plant, Units 1 and 2

List of Commitments

TVA will complete the review of the Safety Evaluation Report and document adherence to the Limitations and Conditions contained in Section 4.0 in the appropriate TVA calculations and design documents and will submit the results of this effort to NRC by June 20, 2014.