



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

CNL-19-119

November 19, 2019

10 CFR 50.90
10 CFR 50.91

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

Sequoyah Nuclear Plant, Unit 1
Renewed Facility Operating License No. DPR-77
NRC Docket No. 50-327

Subject: **Response to Request for Additional Information Regarding Sequoyah Nuclear Plant, Unit 1 Exigent License Amendment Request to Revise Technical Specification 4.2.2, "Control Rod Assemblies" (SQN-TS-19-05) (EPID L-2019-LLA-0239)**

- References:
1. TVA Letter to NRC, CNL-19-116, "Sequoyah Nuclear Plant Unit 1 – Exigent License Amendment Request to Revise Technical Specification 4.2.2, "Control Rod Assemblies" (SQN-TS-19-05)," dated November 16, 2019 (ML19320C333)
 2. NRC Electronic Email to TVA, "Request for Additional Information - SQN 1 Exigent CR H-08 Removal - EPID L-2019-LLA-0239," dated November 18, 2019 (ML19323D756)

In Reference 1, Tennessee Valley Authority (TVA) submitted a request for an amendment to Renewed Facility Operating License Nos. DPR-77 for Sequoyah Nuclear Plant, Unit 1 (SQN1). The proposed amendment would revise Technical Specification (TS) 4.2.2, "Control Rod Assemblies," to permit the SQN1 Cycle 24 (U1C24) core to contain 52 full length control rods with no full length control rod assembly in core location H-08 for one cycle.

In Reference 2, the Nuclear Regulatory Commission (NRC) transmitted a request for additional information (RAI) and requested a response by November 19, 2019. The enclosure to this letter provides the TVA response to the RAI.

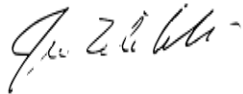
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The enclosure to this letter does not change the no significant hazards consideration or the environmental considerations contained in Reference 1. Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and the enclosure to the Tennessee Department of Environment and Conservation.

There are no new regulatory commitments associated with this submittal. Please address any questions regarding this request to Kimberly D. Hulvey at (423) 751-3275.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 19th day of November 2019.

Respectfully,

A handwritten signature in dark ink, appearing to read "James T. Polickoski".

James T. Polickoski
Director, Nuclear Regulatory Affairs

Enclosure:

Response to Request for Additional Information Regarding Sequoyah Nuclear Plant, Unit 1
Exigent License Amendment Request to Revise Technical Specification 4.2.2, "Control Rod
Assemblies"

cc (Enclosure):

NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Sequoyah Nuclear Plant
NRC Project Manager – Sequoyah Nuclear Plant
Director, Division of Radiological Health - Tennessee State Department of Environment
and Conservation

Enclosure

Response to Request for Additional Information Regarding Sequoyah Nuclear Plant, Unit 1
Exigent License Amendment Request to Revise Technical Specification 4.2.2, "Control Rod
Assemblies"

By letter number CNL-19-116 dated November 16, 2019 (Agencywide Documents and Access Management System (ADAMS) Accession No. ML19320C333), Tennessee Valley Authority (TVA) requested Nuclear Regulatory Commission (NRC) approval of an exigent License Amendment Request (LAR) for Sequoyah Nuclear Plant (SQN) Unit 1.

Pursuant to Title 10, Code of Federal Regulations, Part 50, 10 CFR 50.90, TVA requested approval of the exigent LAR to operate the SQN Unit 1 for one cycle (U1C24) with no full length control rod assembly in core location H-08. The EMIB branch requests the following additional information.

SQN1-EMIB-RAI-01:

- (a) *In sections 3.4, 3.5, and 4.3 of the LAR, it is mentioned that the H-08 control rod and drive shaft will be removed from service, and a flow restrictor will be installed in the H-08 control rod guide tube in the reactor vessel upper internals.*

Please clarify that the design and construction of the flow restrictor is adequately certified in accordance with the applicable code.

TVA Response to EMIB-RAI-01

The installed flow restrictor is a standard component used to hydraulically simulate the control rod drive mechanism (CRDM) drive shaft clearance with the guide tube housing opening. This will establish hydraulically equivalent flow conditions in the upper internals when the drive shaft is removed. A generic structural analysis of the restrictor plate/orifice assembly has been performed using a bounding pressure differential load for the faulted service condition (Loss of Coolant Accident (LOCA)). This analysis conservatively assumed no orifice holes in the assembly to maximize the differential pressure load. The analysis demonstrated that all membrane and bending, bearing, and shear stress intensities satisfy the requirements of the 1989 Edition of ASME Section III. Bolting preload adequate to resist assembly separation was also demonstrated for the maximum LOCA pressure loads. The generic analysis has been reviewed and confirmed to bound SQN plant-specific service conditions.

Materials for the flow restrictor assembly conform to the ASME Code, Section II, Part A. The restrictor assembly is manufactured from 304 stainless steel, which is the same material as the guide tube, and is compatible with fluid conditions in the reactor vessel upper internals. Because the restrictor assembly and the guide tube are both the same material, there will be no differential thermal expansion.

Installation of the restrictor is controlled to ensure that the required hex bolt preload is obtained, securely locking the flow restrictor in place at the top of the guide tube. A locking cup, which is tack welded to the flow restrictor, is crimped onto the hex bolt to prevent hex bolt rotation. The capture features of the flow restrictor (i.e., locking fingers, hex bolt cup,

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hex bolt preload) provide assurance that the flow restrictor is securely installed and will not result in the generation of loose parts.

The reactor internals at SQN are designed and analyzed to the requirements of Section 3.9.3 of the Updated Final Safety Analysis Report (UFSAR), "NSSS Components Not Covered by the ASME Code." The basis for the design stress and deflection criteria is summarized in Section 4.2.2.5 of the UFSAR. While the restrictor assembly does not perform a core support or safety function, it is classified as ANSI Safety Class 3. All of the calculated stresses are within the ASME Code allowables. The restrictor assembly materials, fabrication, and design analysis discussed above meet the intent of ASME Code Subsection NG consistent with the SQN design basis and UFSAR design summary.