



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 25, 2022

Mr. James Barstow
Vice President, Nuclear Regulatory Affairs
and Support Services
Tennessee Valley Authority
1101 Market Street, LP 4A-C
Chattanooga, TN 37402-2801

SUBJECT: SEQUOYAH NUCLEAR PLANT, UNIT 1 – SUMMARY OF VERBAL
AUTHORIZATION OF ALTERNATIVE REQUEST RP-12 FOR THE
1B-B CENTRIFUGAL CHARGING PUMP (EPID L-2022-LLR-0055)

Dear Mr. Barstow:

By letter dated July 20, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22201A556), as supplemented by letter dated July 21, 2022 (ADAMS Accession No. ML22202A508), the Tennessee Valley Authority (the licensee) proposed to the U.S. Nuclear Regulatory Commission (NRC) an alternative to specific requirements in the American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants*, Section IST, "Rules for Inservice Testing of Light-Water Reactor Power Plants" (OM Code), 2004 Edition through 2006 Addenda, for Sequoyah Nuclear Plant (Sequoyah) Unit 1, pursuant to Title 10 of the *Code of Federal Regulations*, Part 50, Section 55a (10 CFR 50.55a).

in lieu of specific provisions in Subsection ISTB, paragraph ISTB-3310, in the ASME OM Code and paragraph 16-3310 in ASME OM Code Case OMN-16, Revision 2, "Use of a Pump Curve for Testing," the licensee proposed to perform a Group A test of the 1B-B centrifugal charging pump (CCP) in accordance with ASME OM Code Case OMN-16, Revision 2, paragraph 16-3300, to establish the reference curve for the range of flow rates achievable with Sequoyah, Unit 1, in Mode 1. Further, the licensee proposed to perform the required ASME OM Code, paragraph ISTB-3300, "Effect of Pump Replacement, Repair, and Maintenance on Reference Values," comprehensive or preservice test of the 1B-B CCP with Sequoyah, Unit 1, in Mode 6 during the October 2022 refueling outage. In its alternative request under 10 CFR 50.55a(z)(2), the licensee asserted that compliance with ASME OM Code, paragraph ISTB-3310, and OM Code Case OMN-16, paragraph 16-3310, would cause a hardship or unusual difficulty without a compensating increase in the level of quality or safety.

The NRC reviewed the licensee's submittal, as supplemented, and determined that complying with specific requirements of ASME OM Code, paragraph ISTB-3310, and OM Code Case OMN-16, paragraph 16-3310, would result in hardship or unusual difficulty, without a compensating increase in the level of quality and safety, and that the licensee met the regulatory requirements in 10 CFR 50.55a(z)(2). Therefore, during a conference call with the licensee on July 21, 2022, the NRC staff verbally authorized the licensee's one-time use of Alternative Request RP-12 until the completion of the comprehensive or preservice test of the 1B-B CCP with Sequoyah, Unit 1, in Mode 6 during the October 2022 refueling outage. Enclosed are the script for the verbal authorization and a list of the participants on the July 21, 2022 telephone call.

This verbal authorization does not preclude the NRC staff from asking additional clarification questions regarding Alternative Request RP-12 while preparing the subsequent written safety evaluation. The NRC staff's goal is to issue the written safety evaluation within 150 days from the date of the verbal authorization. Please direct any inquiries to me at 301-415-0272 or Lucas.Haeg@nrc.gov.

Sincerely,

/RA/

Luke Haeg, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-327

Enclosures:

1. Verbal Authorization Script
2. List of Attendees

cc: Listserv

VERBAL AUTHORIZATION BY THE NRC OFFICE OF NUCLEAR REACTOR REGULATION

ALTERNATIVE REQUEST RP-12 FOR CENTRIFUGAL CHARGING PUMP 1B-B

SEQUOYAH NUCLEAR PLANT, UNIT 1

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-327

Technical Evaluation read by Stewart Bailey, Chief, Mechanical Engineering and Inservice Testing Branch, Division of Engineering and External Hazards, NRC Office of Nuclear Reactor Regulation

This call is for the NRC to verbally authorize the Tennessee Valley Authority to use an alternative to the requirements of the ASME Operation and Maintenance Code. The request is designated RP-12. TVA submitted RP-12 on July 20, 2022, and provided supplemental information on July 21, 2022. The ADAMS accession numbers are ML22201A556 and ML22202A508, respectively. Title 10 of the *Code of Federal Regulations*, Section 50.55a, permits the staff to verbally authorize alternatives in circumstances where the licensee has docketed all pertinent information, the NRC staff has completed its review, and there is not enough time for the NRC to issue its safety evaluation before the alternative is needed. That is the case here.

The alternative would allow TVA to defer some of the ASME-required testing of the centrifugal charging pump 1B-B at the Sequoyah Nuclear Plant, Unit 1, on the basis that conducting the testing would represent a hardship without a compensating increase in the level of quality and safety. Charging pump 1B-B was declared inoperable on July 18, 2022, when it was found to not meet its flow requirements. TVA is repairing the pump, which includes a changeout of the flow element. This type of repair has the potential to affect the pump's flow characteristics. Under these circumstances, the ASME Code for Inservice Testing requires that the pump undergo what is referred to as a preservice test or a comprehensive test. This type of test includes establishing the head-flow characteristics of the pump by taking at least five measurements from essentially minimum flow to design basis flow rates. The Code of Record for Sequoyah Unit 1 is the 2004 Edition through 2006 Addenda of the ASME OM Code.

However, the licensee stated that this flow testing is only conducted in Mode 6 with the reactor vessel head removed, because the system does not have a full flow test loop. Sequoyah Unit 1 is currently in Mode 1 at 100% power. Bringing the unit to Mode 6 with the head removed and returning the unit to Mode 1 represents a hardship without a compensating increase in the level of quality and safety – which is the criteria in 10 CFR 50.55a(z)(2). Further, due to weather conditions, there is a high demand on the electrical grid. TVA stated that a loss of electricity from a Sequoyah unit would further stress the grid.

The proposed alternative is to defer the comprehensive pump test until the next practical opportunity, which is the next refueling outage scheduled for October of 2022. Instead of conducting the comprehensive test after the maintenance, the licensee will perform what is referred to as a Group A test, which is a test at a lower flow rate intended to identify degradation of a pump. TVA stated that they would establish a reference flow curve for the range of flows achievable in Mode 1 and use these to evaluate the pump performance, but TVA will not be able to establish the range of flows needed for the comprehensive test.

In discussing the post-maintenance testing, the licensee stated that any significant abnormalities in pump performance should be detectable by a deviation from the expected hydraulic performance. The licensee also plans to monitor the pump's performance during plant operation. The licensee stated that the pump has performance parameters that can detect degradation or eminent failure when the pump is in normal service.

During the October 2022 refueling outage (U1R25), the licensee will conduct the comprehensive or preservice test as required by ASME OM Code. The licensee stated that, in the event of an unplanned outage before U1R25, an evaluation will be made of whether plant conditions would be favorable to performing the required comprehensive or preservice test. This evaluation would include consideration of the removal of the reactor vessel head to conduct the testing.

In its July 21, 2022 supplement, TVA stated that, based on its current determination, the cause of the failure of the CCP 1B-B is wear of the rotating element after 21 years (100,000 hours) of high head and low flow operation. Therefore, TVA plans to replace the entire rotating element within the pump casing. TVA also stated that the pump motor was tested using Baker diagnostic equipment under flow conditions, and the pump motor data showed consistent performance with increasing flow and no adverse impact on motor operation. Further, the licensee determined that no concern currently exists for a similar failure of the other charging pump, 1A-A, because it has experienced only one-tenth of the operating hours of 1B-B.

Based on the information provided by TVA, the NRC staff finds that a hardship exists without a compensating increase in the level of quality and safety, in accordance with 10 CFR 50.55a(z)(2), for the performance of a comprehensive or preservice test of charging pump 1B-B following the ongoing repair. With the compensating measures described in TVA's request, the NRC finds that the licensee's proposed alternative will provide reasonable assurance that charging pump 1B-B at Sequoyah, Unit 1, will be operationally ready to perform its safety function until the comprehensive or preservice test is performed during the October 2022 refueling outage. All other ASME OM Code requirements for which relief or an alternative was not specifically requested and granted or authorized as part of this alternative request remain applicable. If the licensee identifies a performance issue with the charging pump 1B-B, the licensee will be expected to take action to implement the requirements of its Technical Specifications. This Verbal Authorization is applicable to Alternative Request RP-12 until the October 2022 refueling outage at Sequoyah, Unit 1.

The NRC staff's detailed review of Alternative Request RP-12 will be provided through a separate safety evaluation.

**Authorization read by David Wrona, Chief of the Plant Licensing Branch II-2,
Office of Nuclear Reactor Regulation, Office of Nuclear Reactor Regulation**

As chief of Plant Licensing Branch II-2, Division of Operating Reactor Licensing, Office of Nuclear Reactor Regulation, I concur with the conclusions of the Mechanical Engineering and Inservice Testing Branch.

The NRC staff concludes that the proposed alternative justifies that performance of the specific ASME OM Code testing requirement for Centrifugal Charging Pump 1B-B following the ongoing maintenance would result in a hardship without a compensating increase in the level of quality and safety in accordance with 10 CFR 50.55a(z)(2). The submittal also provides reasonable assurance that the component is operationally ready. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(2). Therefore, as of July 21, 2022, the NRC authorizes the use of Request for

Alternative RP-12 until the ISTB-3100 and ISTB-3310 required preservice test is completed for the CCP 1B-B during outage U1R25.

All other ASME OM Code requirements for which an alternative was not specifically requested and approved remain applicable.

This verbal authorization does not preclude the NRC staff from asking additional clarification question(s) regarding the proposed alternative while preparing the subsequent written safety evaluation.

LIST OF ATTENDEES

JULY 21, 2022, TELECONFERENCE WITH TENNESSEE VALLEY AUTHORITY

REGARDING VERBAL AUTHORIZATION OF ALTERNATIVE REQUEST RP-12

FOR SEQUOYAH NUCLEAR PLANT, UNIT 1

Name	Organization
Stewart Bailey	U.S. Nuclear Regulatory Commission
Dave Hardage	U.S. Nuclear Regulatory Commission
Yuken Wong	U.S. Nuclear Regulatory Commission
Luke Haeg	U.S. Nuclear Regulatory Commission
David Wrona	U.S. Nuclear Regulatory Commission
Ian Tseng	U.S. Nuclear Regulatory Commission
James Baptist	U.S. Nuclear Regulatory Commission
Ed Miller	U.S. Nuclear Regulatory Commission
Harry Wagage	U.S. Nuclear Regulatory Commission
Geoffrey Ottenberg	U.S. Nuclear Regulatory Commission
Mark Franke	U.S. Nuclear Regulatory Commission
Laura Pearson	U.S. Nuclear Regulatory Commission
Lance Day	U.S. Nuclear Regulatory Commission
Duke Dang	Tennessee Valley Authority
Stuart Rymer	Tennessee Valley Authority
Jeffrey Sowa	Tennessee Valley Authority
Kevin Groom	Tennessee Valley Authority
Russell Wells	Tennessee Valley Authority
Luke Greene	Tennessee Valley Authority
Robert Smith	Tennessee Valley Authority
Gordon Williams	Tennessee Valley Authority
Darlene Delk	Tennessee Valley Authority

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JULY 25, 2022

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ADAMS Accession No.: ML22203A112

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NAME	DWrona	LHaeg	
DATE	07/22/2022	07/25/2022	

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