



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

December 4, 2015

Mr. Joseph W. Shea
Vice President, Nuclear Licensing
Tennessee Valley Authority
1101 Market Street, LP 3R-C
Chattanooga, TN 37402-2801

SUBJECT: SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2 – REQUEST FOR
RELIEF RP-07 FOR ALTERNATIVE INSERVICE PUMP TESTING AT
REFERENCE VALUES (CAC NOS. MF5585 AND MF5586)

Dear Mr. Shea:

By letter dated December 31, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14365A207), as supplemented by letter dated July 22, 2015 (ADAMS Accession No. ML15203B243), Tennessee Valley Authority (the licensee) requested relief from certain requirements of the American Society of Mechanical Engineers Code for Operation and Maintenance of Nuclear Power Plants (ASME OM Code) for the inservice testing (IST) program at the Sequoyah Nuclear Plant (SQN), Units 1 and 2, for the remainder of the third and for the entire fourth 10-year IST programs interval. The licensee submitted Request for Relief RP-07 as an alternative for ASME OM Code inservice pump testing.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(a)(3)(i), the licensee requested relief from the ASME OM Code on the basis that complying with the specified code would result in unusual difficulty due to system limitations in throttle valve adjustments, without a compensating increase in the level of quality and safety. Furthermore, the alternative alleviates difficulties due to system limitations, yet provides the intended assurance and monitoring of the original IST.

An inquiry was submitted to the ASME OM Code Committee to determine what alternatives may be used when it is impractical to operate a pump at a specified reference point for flow rate, differential pressure, or discharge pressure. In response to the inquiry, ASME OM Code Case OMN-21 (hereinafter "Code Case OMN-21") was developed to provide guidance on alternatives. Code Case OMN-21 was approved by the ASME Operation and Maintenance Standards Committee on April 20, 2012, with the U.S. Nuclear Regulatory Commission (NRC) representative voting in the affirmative. The language from Code Case OMN-21 has been included in ASME OM-2012. The NRC staff has proposed to include Code Case OMN-21 in the next revision of Regulatory Guide 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code." The licensee's Request for Relief RP-07 is an alternative to the ASME OM Code and is based upon operating associated pumps at, or as close as practical to, specified reference points within specified ranges as outlined in Code Case OMN-21.

The NRC staff reviewed the subject request and concludes, as set forth in the enclosed safety evaluation, that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.552(a)(3)(i). Therefore, the NRC staff authorizes the use of Request for

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Relief RP-07 at SQN, Units 1 and 2, for the remainder of the third 10-year IST program, which began on June 1, 2006, and is scheduled to end on May 31, 2016, and for the entire fourth 10-year IST program, which begins on June 1, 2016, and is scheduled to end on May 31, 2026.

All other ASME Code, Section XI, requirements for which relief was not specifically requested and authorized herein by the NRC staff remain applicable, including the third party review by the Authorized Nuclear Inservice Inspector.

If you have any questions, please contact the Project Manager, Andrew Hon, at 301-415-8480 or Andrew.Hon@nrc.gov.

Sincerely,



Benjamin G. Beasley, Branch Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-327 and 50-328

Enclosure:
Safety Evaluation

cc w/enclosure: Distribution via Listserv



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR RELIEF NO. RP-07

RELATED TO THE INSERVICE TESTING PROGRAM

FOR THE REMAINDER OF THE THIRD AND

FOR THE ENTIRE FOURTH 10-YEAR INTERVAL

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-327 AND 50-328

1.0 INTRODUCTION

By letter dated December 31, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14365A207), as supplemented by letter dated July 22, 2015 (ADAMS Accession No. ML15203B243), Tennessee Valley Authority (TVA, the licensee), submitted Request for Relief RP-07 to the U.S. Nuclear Regulatory Commission (NRC). The licensee proposed alternatives to certain inservice testing (IST) requirements of the American Society of Mechanical Engineers Code for Operation and Maintenance of Nuclear Power Plants (ASME OM Code) for the IST program at the Sequoyah Nuclear Plant (SQN), Units 1 and 2, for the remainder of the third and for the entire fourth 10-year IST programs interval. The third 10-year IST program began on June 1, 2006, and is scheduled to end on May 31, 2016. The fourth 10-year IST program begins June 1, 2016, and is scheduled to end on May 31, 2026.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(i), the licensee requested to use the proposed alternatives in Request for Relief RP-07 on the basis that the alternatives provide an acceptable level of quality and safety.

2.0 REGULATORY EVALUATION

It states, in part, in 10 CFR 50.55a(f), "Inservice testing requirements," that IST of certain ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with the specified ASME OM Code and applicable addenda incorporated by reference in the regulations.

By *Federal Register* notice 79 FR 65776, dated November 5, 2014, which became effective on December 5, 2014, the paragraph headings in 10 CFR 50.55a were revised. Accordingly, relief requests that had been previously covered by 10 CFR 50.55a(a)(3)(i) are now covered under the equivalent 10 CFR 50.55a(z)(1). Relief requests that had been previously covered by

Enclosure

10 CFR 50.55a(a)(3)(ii) are now covered under the equivalent 10 CFR 50.55a(z)(2). The regulation in 10 CFR 50.55a(z), "Alternatives to codes and standards requirements," states that alternatives to the requirements of paragraphs (b) through (h) of this section, or portions thereof, may be used when authorized by the Director, Office of Nuclear Reactor Regulation, or Director, Office of New Reactors, as appropriate. A proposed alternative must be submitted and authorized prior to implementation. The applicant or licensee must demonstrate:

- (1) Acceptable level of quality and safety. The proposed alternative would provide an acceptable level of quality and safety; or
- (2) Hardship without a compensating increase in quality and safety. Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in quality and safety.

Based on the above, and subject to the NRC's findings with respect to authorizing the proposed alternatives to the ASME OM Code given below, the NRC staff finds that regulatory authority exists for the licensee to request, and the Commission to authorize, the alternatives requested by the licensee.

3.0 TECHNICAL EVALUATION

3.1 Licensee's Alternative Request RP-07

ASME OM Code Requirements

The SQN, Units 1 and 2, third 10-year interval IST program, "Code of Record," is ASME OM Code, 2001 Edition through 2003 Addenda. The SQN, Units 1 and 2, fourth 10-year interval IST program "Code of Record," is the ASME OM Code, 2004 Edition through 2006 Addenda.

ISTB-5121, "Group A Test Procedure," (b) states, in part, that, "The resistance of the system shall be varied until the flow rate equals the reference point."

ISTB-5122, "Group B Test Procedure," (c) states, in part, that, "System resistance may be varied as necessary to achieve the reference point."

ISTB-5123, "Comprehensive Test Procedure," (b) states, in part, that, "For centrifugal and vertical line shaft pumps, the resistance of the system shall be varied until the flow rate equals the reference point."

ISTB-5221, "Group A Test Procedure," (b) states, in part, that, "The resistance of the system shall be varied until the flow rate equals the reference point."

ISTB-5222, "Group B Test Procedure," (c) states that, "System resistance may be varied as necessary to achieve the reference point."

ISTB-5223, "Comprehensive Test Procedure," (b) states, in part, that, "The resistance of the system shall be varied until the flow rate equals the reference point."

The licensee has requested an alternative to the pump testing reference value requirements of ISTB-5121, ISTB-5122, ISTB-5123, ISTB-5221, ISTB-5222, and ISTB-5223. The components affected by this alternative request are the pumps listed in the table below. By NRC letter dated May 15, 2015 (ADAMS Accession No. ML15134A002), a similar alternative request was authorized for Wolf Creek Generating Station.

Table 1: Pumps Affected by Request for Relief RP-07

Pump Number	Pump Description	Pump Type	ASME Code Class	ASME OM Code Category
0-PMP-67-432	Essential Raw Cooling Water Pumps	Centrifugal	3	Group A
0-PMP-67-436				
0-PMP-67-440				
0-PMP-67-444				
0-PMP-67-452				
0-PMP-67-456				
0-PMP-67-460				
0-PMP-67-464				
0-PMP-70-51	Component Cooling Water Pumps	Centrifugal	3	Group A
1-PMP-70-38				
1-PMP-70-46				
2-PMP-70-33				
2-PMP-70-59				
0-PMP-313-303	Shutdown Board Room Chilled Water Pumps	Centrifugal	3	Group A
0-PMP-313-338				
1-PMP-62-230	Boric Acid Transfer Pumps	Centrifugal	3	Group A
1-PMP-62-232				
2-PMP-62-230				
2-PMP-62-232				
1-PMP-63-10	Safety Injection Pumps	Centrifugal	2	Group B
1-PMP-63-15				
2-PMP-63-10				
2-PMP-63-15				
1-PMP-72-10	Containment Spray Pumps	Centrifugal	2	Group B
1-PMP-72-27				
2-PMP-72-10				
2-PMP-72-27				
1-PMP-3-118	Auxiliary Feedwater (Motor) Pumps	Centrifugal	3	Group A
1-PMP-3-128				
2-PMP-3-118				
2-PMP-3-128				

1-PMP-3-142	Auxiliary Feedwater (Steam) Pumps	Centrifugal	3	Group B
2-PMP-3-142				
1-PMP-62-104	Centrifugal Charging Pumps	Centrifugal	2	Group A
1-PMP-62-108				
2-PMP-62-104				
2-PMP-62-108				
1-PMP-74-10	Residual Heat Removal Pumps	Centrifugal	2	Group A
1-PMP-74-20				
2-PMP-74-10				
2-PMP-74-20				

Licensee’s Reason for Request

The licensee stated that for pump testing, there is difficulty adjusting system throttle valves with sufficient precision to achieve exact flow reference values during subsequent IST exams and that Section ISTB of the ASME OM Code does not allow for variance from a fixed reference value for pump testing. The licensee also noted that Section 5.3 of NUREG-1482, Revision 2, “Guidelines for Inservice Testing at Nuclear Power Plants,” October 2013 (ADAMS Accession No. ML13295A020), acknowledges that certain pump system designs do not allow for the licensee to set the flow at an exact value because of limitations in the instruments and controls for maintaining steady flow.

The licensee further stated that ASME OM Code Case OMN-21, “Alternate Requirements for Adjusting Hydraulic Parameters to Specified Reference Points” (hereinafter “Code Case OMN-21”), provides guidance for adjusting reference flow/ ΔP to within a specified tolerance during inservice testing. The Code Case states:

It is the opinion of the Committee that when it is impractical to operate a pump at a specified reference point and adjust the resistance of the system to a specified reference point for either flow rate, differential pressure or discharge pressure, the pump may be operated as close as practical to the specified reference point with the following requirements. The Owner shall adjust the system resistance to as close as practical to the specified reference point where the variance from the reference point does not exceed + 2% or – 1% of the reference point when the reference point is flow rate, or + 1% or – 2% of the reference point when the reference point is differential pressure or discharge pressure.

Licensee’s Proposed Alternative

The licensee proposes to perform future inservice pump testing at SQN, Units 1 and 2, in a manner consistent with the requirements as stated in Code Case OMN-21. Specifically, testing of pumps will be performed such that flow rate, or differential, is adjusted as close as practical to the reference value and within limits of +2 %/ - 1% for flow rate, or +1 %/ -2 % for differential pressure.

3.2 NRC Staff Evaluation of Relief Request RP-07

An inquiry was submitted to the ASME OM Code Committee to determine what alternatives may be used when it is impractical to operate a pump at a specified reference point for flow rate, differential pressure, or discharge pressure. In response to the inquiry, Code Case OMN-21 was developed to provide guidance on alternatives. The guidance in Code Case OMN-21 states that when it is impractical to operate a pump at a specified reference point for flow rate, differential pressure, or discharge pressure, the pump may be operated as close as practical to the specified reference point with the following requirements. Code Case OMN-21 specifies that the variance from the reference point shall not exceed +2 percent or - 1 percent of the reference point when the reference point is flow rate, or +1 percent or - 2 percent of the reference point when the reference point is differential pressure or discharge pressure.

Code Case OMN-21 was approved by the ASME Operation and Maintenance Standards Committee on April 20, 2012, with the NRC representative voting in the affirmative. The language from Code Case OMN-21 has been included in ASME OM-2012. The NRC staff has proposed to include Code Case OMN-21 in the next revision of RG 1.192.

The NRC staff notes that in certain situations, it is not possible to operate a pump at a precise reference point. The NRC staff has reviewed the alternatives proposed in Code Case OMN-21 and found that the proposed alternatives are reasonable and appropriate when a pump cannot be operated at a specified reference point. Operation within the tolerance bands specified in Code Case OMN-21 provides reasonable assurance that licensees will be able to utilize the data collected to detect degradation of the pumps. Based on the NRC staff's review of Code Case OMN-21 and the licensee's proposed alternative to use the bands specified in Code Case OMN-21 for flow rate, the NRC staff concludes that implementation of the alternatives contained in Code Case OMN-21 is acceptable for the pumps listed in the table above. Therefore, the NRC staff concludes that the licensee's proposed alternative provides an acceptable level of quality and safety.

4.0 CONCLUSION

As set forth above, the NRC staff has determined that the TVA-proposed alternative request RP-07 for SQN, Units 1 and 2, provides an acceptable level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(1). Therefore, the NRC staff authorizes alternative request RP-07 for SQN, Units 1 and 2, for the remainder of the third 10-year IST interval and for the entire fourth 10-year IST program interval, which begins on June 1, 2016, and is scheduled to end on May 31, 2026.

All other ASME OM Code requirements for which relief was not specifically requested and approved in the subject requests remain applicable.

Principal Contributor: G. Bedi

Dated: November 6, 2015

J. Shea

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Relief RP-07 at SQN, Units 1 and 2, for the remainder of the third 10-year IST program, which began on June 1, 2006, and is scheduled to end on May 31, 2016, and for the entire fourth 10-year IST program, which begins on June 1, 2016, and is scheduled to end on May 31, 2026.

All other ASME Code, Section XI, requirements for which relief was not specifically requested and authorized herein by the NRC staff remain applicable, including the third party review by the Authorized Nuclear Inservice Inspector.

If you have any questions, please contact the Project Manager, Andrew Hon, at 301-415-8480 or Andrew.Hon@nrc.gov.

Sincerely,

/RA/

Benjamin G. Beasley, Branch Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-327 and 50-328

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Safety Evaluation

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