



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

May 16, 2017

Mr. James J. Hutto
Regulatory Affairs Director
Southern Nuclear Operating Company, Inc.
P.O. Box 1295 / Bin 038
Birmingham, AL 35201-1295

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2 – INSERVICE
TESTING ALTERNATIVE FOR PUMPS PER CODE CASE OMN-21 (RR-PR-02)
(CAC NOS. MF9261, MF9262)

Dear Mr. Hutto:

By letter dated February 6, 2017, Southern Nuclear Operating Company Inc. (SNC or the licensee) submitted three relief requests for the Joseph M. Farley Nuclear Plant (FNP), Unit 1 and Unit 2. The three relief requests are:

RR-VR-01, Version 1: Establish 1st interval grace periods per Code Case OMN-20.

RR-PR-02, Version 1: Establish test flow reference ranges per Code Case OMN-21.

RR-PR-03, Version 1: Service Water Pumps and Transfer Pumps Pressure Accuracy.

This letter applies to the relief request RR-PR-02. Relief request RR-PR-03 was approved in U.S. Nuclear Regulation Commission (NRC) letter dated April 12, 2017. Relief request RR-VR-01 continues to be under NRC review.

The licensee is requesting to use the requirements in American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants (OM Code)* Case OMN-21 as an alternative to the inservice testing (IST) requirements of the 2004 Edition through 2006 Addenda of the ASME OM Code for the FNP IST program during the fifth 10-year interval, which will start on December 1, 2017, and end November 30, 2027.

The licensee submitted the request pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 50.55a(z)(1), on the basis that the alternative provides an acceptable level of quality and safety.

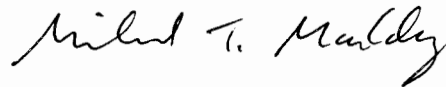
The NRC staff has reviewed the proposed alternative (RR-PR-02, Version 1) and concludes, as set forth in the enclosed safety evaluation, that the alternative provides an acceptable level of quality and safety. The NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(1).

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

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If you have any questions, please contact the Project Manager, Shawn Williams, at 301-415-1009 or by e-mail at Shawn.Williams@nrc.gov.

Sincerely,

A handwritten signature in black ink that reads "Michael T. Markley". The signature is written in a cursive style with a large, sweeping initial "M".

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-348, 50-364

Enclosure:
Safety Evaluation

cc w/enclosure: Distribution via Listserv



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION

OFFICE OF NUCLEAR REACTOR REGULATION

ALTERNATIVE REQUEST RR-PR-02, VERSION 1.0

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

INSERVICE TESTING PROGRAM FIFTH 10-YEAR INTERVAL

JOSEPH M. FARLEY NUCLEAR PLANT UNITS 1 AND 2

DOCKET NUMBERS 50-348 AND 50-364

1.0 INTRODUCTION

By letter dated February 6, 2017, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17037D324), Southern Nuclear Operating Company Inc. (SNC or the licensee) submitted three relief requests for the Joseph M. Farley Nuclear Plant (FNP), Unit 1 and Unit 2. The three relief requests are:

RR-VR-01, Version 1: Establish 1st interval grace periods per Code Case OMN-20.

RR-PR-02, Version 1: Establish test flow reference ranges per Code Case OMN-21.

RR-PR-03, Version 1: Service Water Pumps and Transfer Pumps Pressure Accuracy.

This safety evaluation addresses only RR-PR-02. Relief request RR-PR-03 was approved in U.S. Nuclear Regulation Commission's (NRC) letter dated April 12, 2017 (ADAMS Accession No. ML17093A692). Relief request RR-VR-01 continues to be under NRC review.

In Relief request RR-PR-02, the licensee is requesting to use the requirements in American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code) Case OMN-21 as an alternative to the inservice testing (IST) requirements of the 2004 Edition through 2006 Addenda of the ASME OM Code.

Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 50.55a(z)(1), the licensee requested to use the proposed relief request on the basis that the alternative provides an acceptable level of quality and safety.

Enclosure

2.0 REGULATORY EVALUATION

Paragraph 10 CFR 50.55a(f), "Inservice Testing Requirements," requires, in part, that IST of certain ASME Code Class 1, 2, and 3 components must meet the requirements of the ASME OM Code and applicable addenda, except where alternatives have been authorized pursuant to paragraphs 10 CFR 50.55a(z)(1) or 10 CFR 50.55a(z)(2).

In proposing alternatives, a licensee must demonstrate that the proposed alternatives provide an acceptable level of quality and safety (10 CFR 50.55a(z)(1)) or compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety (10 CFR 50.55a(z)(2)). In accordance with 10 CFR 50.55a(z)(1), SNC stated that alternative RR PR-02 would provide an acceptable level of quality and safety.

Based on the above, and subject to the following technical evaluation, the NRC staff finds that regulatory authority exists for the licensee to request and the Commission to authorize the alternative requested by the licensee.

3.0 TECHNICAL EVALUATION

3.1 Components Affected

Relief was requested for the following pumps:

Pump Groups (Unit 1)	Description	Pump Type	ASME Code Class	ASME OM Code Category
Q1E11P001A Q1E11P001B	Residual Heat Removal (RHR)	Centrifugal	2	Group A
Q1E13P001A Q1E13P001B	Containment Spray (CS)	Centrifugal	2	Group B
Q1E21P002A Q1E21P002B Q1E21P002C	Charging/High Head Safety Injection (HHSI)	Centrifugal	2	Group A
Q1E21P005A Q1E21P005B	Boric Acid Transfer (BAT)	Centrifugal	3	Group A
Q1N23P001A Q1N23P001B	Motor Driven Auxiliary Feedwater (AFW)	Centrifugal	3	Group A
Q1N23P002	Turbine Driven AFW	Centrifugal	3	Group B

Pump Groups (Unit 1)	Description	Pump Type	ASME Code Class	ASME OM Code Category
Q1P16P001A Q1P16P001B Q1P16P001C Q1P16P001D Q1P16P001E	Service Water	Vertical Line Shaft Centrifugal	3	Group A
Q1P17P001A Q1P17P001B Q1P17P001C	Component Cooling Water	Centrifugal	3	Group A

Pump Groups (Unit 2)	Description	Pump Type	ASME Code Class	ASME OM Code Category
Q2E11P001A Q2E11P001B	Residual Heat Removal (RHR)	Centrifugal	2	Group A
Q2E13P001A Q2E13P001B	Containment Spray (CS)	Centrifugal	2	Group B
Q2E21P002A Q2E21P002B Q2E21P002C	Charging/High Head Safety Injection (HHSI)	Centrifugal	2	Group A
Q2E21P005A Q2E21P005B	Boric Acid Transfer (BAT)	Centrifugal	3	Group A
Q2N23P001A Q2N23P001B	Motor Driven AFW	Centrifugal	3	Group A
Q2N23P002	Turbine Driven AFW	Centrifugal	3	Group B
Q2P16P001A Q2P16P001B Q2P16P001C Q2P16P001D Q2P16P001E	Service Water	Vertical Line Shaft Centrifugal	3	Group A
Q2P17P001A Q2P17P001B Q2P17P001C	Component Cooling Water	Centrifugal	3	Group A

3.2 Applicable ASME OM Code

ASME OM Code-2004 Edition with Addenda through OMB-2006.

The licensee requested relief from the following OM Code requirements:

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

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

ISTB-5123, Comprehensive Test Procedure, paragraph ISTB-5123(b) states, in part, that "The resistance of the system shall be varied until the flow rate equals the reference point. Alternatively, the flow rate shall be varied until the differential pressure equals the reference point."

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

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

ISTB-5223, Comprehensive Test Procedure, paragraph ISTB-5123(b) states, in part, that "The resistance of the system shall be varied until the flow rate equals the reference point. Alternatively, the flow rate shall be varied until the differential pressure equals the reference point."

3.3 Duration of the Proposed Alternative

Fifth 10-year IST program interval beginning December 1, 2017, and ending November 30, 2027.

3.4 Reason for Request

The licensee states, in part, that:

For pump testing, there is difficulty adjusting system throttle valves with sufficient precision to achieve exact flow reference values during subsequent IST tests. Section ISTB of the ASME OM Code does not allow for variance from a fixed reference value for pump testing. However, NUREG-1482, Revision 2, Section 5.3, 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.

ASME OM Code Case OMN-21, "Alternative Requirements for Adjusting Hydraulic Parameters to Specified Reference Points," provides guidance for adjusting reference flow, differential pressure (ΔP) to within a specified tolerance during pump inservice testing. The Code Case states that:

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.

3.5 Proposed Alternative

The application states, in part, that:

FNP seeks to perform future inservice pump testing in a manner consistent with the requirements as stated in ASME OM Code Case OMN-21. Specifically, testing of all pumps identified [above] will be performed such that the flow rate is adjusted as close as practical to the reference value and within proceduralized limits of +2% / -1 % of the reference flow rate when the reference point is flow rate and the differential pressure will be adjusted as close as practical to the reference value and within the proceduralized limits of +1 % / -2% of the reference differential pressure when the reference point is differential pressure.

FNP plant operators will continue to strive to achieve the exact test reference values (flow or differential pressure) during testing. Typical test guidance will be to adjust flow or differential pressure to the specific reference value with additional guidance that if the reference value cannot be achieved with reasonable effort, the test will be considered valid if the steady state flow rate is within the proceduralized limits of +2% / -1 % of the reference value or the steady state differential pressure is within the proceduralized limits of +1 % / -2% of the reference value.

3.6 Basis for 10 CFR 50.55a(z)(1)

The licensee stated that as an alternative to the specific ASME IST Requirements, IST for the pumps identified in Table RR-PR-02 will be performed consistent with ASME OM Code Case OMN-21, which ensures adequate indication of pump performance and thus provides an acceptable level of quality and safety per the requirements in 10 CFR 50.55a(z)(1).

3.7 NRC Staff Evaluation

Pursuant to 10 CFR 50.55a, "Codes and standards," paragraph (z)(1), the licensee proposed an alternative to the pump testing reference value requirements of the ASME OM Code on the basis that the proposed alternative would provide an acceptable level of quality and safety. The licensee requested that the alternative be applicable to inservice testing of all IST Program pumps for FNP, Units 1 and 2, as listed above for the duration of the fifth IST interval beginning December 1, 2017, ending November 30, 2027.

An inquiry was submitted to the ASME OM Code to determine what alternatives may be used when it is impractical to operate a pump at a specified reference point for either flow rate, differential pressure, or discharge pressure. ASME 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 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. 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 licensee proposes to adopt Code Case OMN-21. The applicability of Code Case OM-21 is the ASME OM Code 1995 Edition through the 2011 Addenda. The NRC staff notes that the language from Code Case OMN-21 has subsequently been included in the ASME OM Code, 2012 Edition.

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 ASME OM 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 ASME OM 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 above, the NRC staff concludes that the licensee's proposed implementation of the alternatives contained in ASME OM Code Case OMN-21 provides reasonable assurance of safety for the components listed in Section 3.1 of this safety evaluation. 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 finds that the proposed alternative provides an acceptable level of quality and safety for the pumps listed table RR-PR-02. 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) for alternative request RR-PR-02. Therefore, the NRC staff authorizes alternative request RR-PR-02, Version 1, for FNP Units 1 and 2 for the fifth 10-year IST program interval which is scheduled to begin on December 1, 2017, ending November 30, 2027.

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

Principal Contributor: John Billerbeck, NRR

Date: May 16, 2017

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2 – INSERVICE
TESTING ALTERNATIVE FOR PUMPS PER CODE CASE OMN-21 (RR-PR-02)
(CAC NOS. MF9261, MF9262) DATED MAY 16, 2017

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