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

December 22, 2015

Vice President, Operations
Entergy Nuclear Operations, Inc.
Palisades Nuclear Plant
27780 Blue Star Memorial Highway
Covert, MI 49043-9530

SUBJECT: PALISADES NUCLEAR PLANT – RELIEF REQUEST NUMBERS RR 5-2 AND 5-3, PROPOSED ALTERNATIVE TO THE REQUIREMENTS OF THE ASME OM CODE FOR THE FIFTH 10-YEAR INSERVICE TEST INTERVAL (CAC NO. MF6248)

Dear Sir:

By letter dated May 19, 2015 (Agencywide Documents and Access Management System (ADAMS) Accession No. ML15142A643), as supplemented by letter dated September 9, 2015 (ADAMS Accession No. ML15253A682), Entergy Nuclear Operations, Inc. (ENO, the licensee) submitted a request to the U.S. Nuclear Regulatory Commission (NRC) for an alternative test plan in lieu of certain inservice testing (IST) requirements of the 2004 Edition through 2006 Addenda of the American Society of Mechanical Engineers (ASME) Code for *Operation and Maintenance of Nuclear Power Plants* (OM Code) at the Palisades Nuclear Plant (PNP).

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 55a(z)(2), the licensee requested to use the proposed alternatives in RR 5-2 and RR 5-3 on the basis that complying with the current ASME OM Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The NRC staff has reviewed the subject request and concludes, as set forth in the enclosed safety evaluation (SE), there is reasonable assurance that the affected components are 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, the NRC staff authorizes the proposed alternatives in requests RR 5-2 and RR 5-3 for the fifth 10-year IST interval at PNP which is currently scheduled to begin on March 24, 2016, and conclude on March 23, 2026.

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

If you have any questions, please contact the Project Manager, Jennivine Rankin at 301-415-1530 or via e-mail at Jennivine.Rankin@nrc.gov.

Sincerely,

David L. Pelton, Chief
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-255

Enclosure:
Safety Evaluation

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UNITED STATES
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST NUMBERS RR 5-2 AND RR 5-3

RELATED TO THE FIFTH 10-YEAR INTERVAL INSERVICE TESTING PROGRAM

PALISADES NUCLEAR PLANT

ENTERGY NUCLEAR OPERATIONS, INC

DOCKET NUMBER 50-255

1.0 INTRODUCTION

By letter dated May 19, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15142A643) and supplemental letter dated September 9, 2015 (ADAMS Accession No. ML15253A682), Entergy Nuclear Operations, Inc. (ENO, the licensee), submitted alternative requests RR 5-2 and RR 5-3 to the U.S. Nuclear Regulatory Commission (NRC). The licensee requested an alternative test plan in lieu of certain inservice testing (IST) requirements of the 2004 Edition through 2006 Addenda of the American Society of Mechanical Engineers (ASME) Code for *Operation and Maintenance of Nuclear Power Plants* (OM Code) for the IST program at Palisades Nuclear Plant (PNP) during the fifth 10-year IST program interval, which is currently scheduled to begin on March 24, 2016, and conclude on March 23, 2026.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 50.55a(z)(2), the licensee requested to use proposed alternatives RR 5-2 and RR 5-3 on the basis that complying with the current ASME OM Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

2.0 REGULATORY EVALUATION

The regulation at 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)).

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. Licensee's Alternative Request RR 5-2

This request applies to the frequency specifications of the ASME OM Code. The frequencies for tests given in the ASME OM Code include the following but does not include a tolerance band:

ISTA-3120, "Inservice Test Interval," (a) states, "The frequency for inservice testing shall be in accordance with the requirements of Section IST."

ISTB-3400, "Frequency of Inservice Tests," states, "An inservice test shall be run on each pump as specified in Table ISTB-3400-1."

Table ISTB-3400-1, "Inservice Test Frequency," notes that Group A and Group B pump tests are to be conducted quarterly and comprehensive pump tests are to be conducted biennially.

ISTC-3510, "Exercising Test Frequency," states, "Active Category A, Category B, and Category C check valves shall be exercised nominally every 3 months, except as provided by ISTC-3520, ISTC-3540, ISTC-3550, ISTC-3570, ISTC-5221, and ISTC-5222. Power-operated valves shall be exercise tested once per fuel cycle."

ISTC-3540, "Manual Valves," states, "Manual valves shall be full-stroke exercised at least once every 2 years, except where adverse conditions may require the valve to be tested more frequently to ensure operational readiness. Any increased testing frequency shall be specified by the Owner. The valve shall exhibit the required change of obturator position."

ISTC- 3630, "Leakage Rate for Other Than Containment Isolation Valves," (a) "Frequency," states, "Tests shall be conducted at least once every 2 years."

ISTC-3700, "Position Verification Testing," states, in part, "Valves with remote position indicators shall be observed locally at least once every 2 years to verify that valve operation is accurately indicated."

ISTC-5221 "Valve Obturator Movement," (c)(3), states, "At least one valve from each group shall be disassembled and examined at each refueling outage; all valves in each group shall be disassembled and examined at least once every 8 years."

Mandatory Appendix I, "Inservice Testing of Pressure Relief Devices in Light-Water Reactor Nuclear Power Plants," I-1320, "Test Frequencies, Class 1 Pressure Relief Valves," (a), "5-Year Test Interval," states, in part, "Class 1 pressure relief valves shall be tested at least once every 5 years, starting with initial electric power generation."

Mandatory Appendix I, I-1330, "Test Frequency, Class 1 Nonreclosing Pressure Relief Devices," states, "Class 1 nonreclosing pressure relief devices shall be replaced every 5 years unless historical data indicates a requirement for more frequent replacement."

Mandatory Appendix I, I-1340, "Test Frequency, Class 1 Pressure Relief Valves That Are Used for Thermal Relief Application," states, 'Tests shall be performed in accordance with I-1320, Test Frequencies, Class 1 Pressure Relief Valves."

Mandatory Appendix I, I-1350, "Test Frequency, Classes 2 and 3 Pressure Relief Valves," (a), "10-Year Test Interval," states, in part, "Class 2 and 3 pressure relief valves, with the exception of PWR main steam safety valves, shall be tested every ten years, starting with initial electric power generation."

Mandatory Appendix I, I-1360, "Test Frequency, Classes 2 and 3 Nonreclosing Pressure Relief Devices," states, "Classes 2 and 3 nonreclosing pressure relief devices shall be replaced every 5 years, unless historical data indicates a requirement for more frequent replacement."

Mandatory Appendix I, I-1370, 'Test Frequency, Classes 2 and 3 Primary Containment Vacuum Relief Valves," states, "(a) Tests shall be performed on all Classes 2 and 3 containment vacuum relief valves at each refueling outage or every 2 years, whichever is sooner, unless historical data requires more frequent testing. (b) Leak tests shall be performed on all Classes 2 and 3 containment vacuum relief valves at a frequency designated by the Owner in accordance with Table ISTC-3500-1."

Mandatory Appendix I, I-1380, 'Test Frequency, Classes 2 and 3 Vacuum Relief Valves, Except for Primary Containment Vacuum Relief Valves," states, "All Classes 2 and 3 vacuum relief valves shall be tested every 2 years, unless performance data suggest the need for a more appropriate test interval."

Mandatory Appendix I, I-1390, "Test Frequency, Classes 2 and 3 Pressure Relief Devices That Are Used for Thermal Relief Application," states, "Tests shall be performed on all Classes 2 and 3 relief devices used in thermal relief application every 10 years, unless performance data indicate more frequent testing is necessary. In lieu of tests the Owner may replace the relief devices at a frequency of every 10 years, unless performance data indicate more frequent replacements are necessary."

Mandatory Appendix II, "Check Valve Condition Monitoring Program," II-4000, "Condition-Monitoring Activities," (a), "Performance Improvement Activities," (1), states, in part, "If sufficient information is not currently available to complete the analysis required in II-3000, or if this analysis is inconclusive, then the following activities shall be performed at sufficient intervals over an interim period of the next 5 years or two refueling outages, whichever is less, to determine the cause of failure or the maintenance patterns."

Mandatory Appendix II, II-4000, (b), "Optimization of Condition-Monitoring Activities," (1)(e), states, "Identify the interval of each activity. Interval extensions shall be limited to one fuel cycle per extension. Intervals shall not exceed the maximum intervals shown in Table II-4000-1. All valves in a group sampling plan must be tested or examined again, before the interval can be extended again, or until the maximum interval would be exceeded. The requirements of ISTA-3120, Inservice Test Interval, do not apply."

ASME OM Code Cases listed in Regulatory Guide 1.192 Revision 1, "Operation and Maintenance Code Case Acceptability, ASME OM Code"

The duration of the requested relief is for the fifth 10-year IST interval which will begin on March 24, 2016, and conclude on March 23, 2026.

Reason for Request

By letter dated May 19, 2015, the licensee describes the reason for the request for an alternative:

> Pursuant to 10 CFR 50.55a, *Codes and standards*, paragraph (z)(2), *Alternatives to codes and standards requirements, Hardship without a compensating increase in quality and safety*, relief is requested from the frequency specifications of the ASME OM Code. The basis for relief is that the ASME OM Code requirements present an undue hardship without a compensating increase in the level of quality or safety.
>
> ASME OM Code Section IST establishes the inservice test frequency for all components within the scope of the Code. The frequencies (e.g., quarterly) have historically been interpreted as "nominal" frequencies (generally as defined in the Table 3.2 of NUREG 1482, Revision 2) and Owners routinely applied the surveillance extension time period (i.e., grace period) contained in the plant Technical Specifications (TS) Surveillance Requirements (SR). The TS typically allow for a less than or equal to 25% extension of the surveillance test interval to accommodate plant conditions that may not be suitable for conducting the surveillance (SR 3.0.2). However, regulatory issues have been raised concerning the applicability of the TS "grace period" to ASME OM Code required inservice test frequencies irrespective of allowances provided under TS Administrative Controls (i.e., TS 5.5.7, "Inservice Testing Program," invokes SR for various ASME OM Code frequencies).
>
> The lack of a tolerance band on the ASME OM Code inservice test frequency restricts operational flexibility. For example, there may be a conflict in which a surveillance test could be required (i.e., its frequency could expire), but it is not possible or not desired that the test be performed until after a specific plant condition is reached or an associated Limiting Condition for Operation (LCO) is within its applicability.
>
> The Nuclear Regulatory Commission (NRC) recognized this potential issue in the TS by allowing a frequency tolerance as described in PNP's Renewed Facility Operating License TS SR 3.0.2 and Administrative Controls Section 5.5.7. The lack of a similar tolerance for ASME OM Code testing places an unusual hardship on the plant to adequately schedule work tasks without operational flexibility.
>
> Thus, just as with TS required surveillance testing, some tolerance is needed to allow adjusting ASME OM Code testing intervals to align with plant conditions and other maintenance and testing activities. This assures operational flexibility when scheduling surveillance tests in a manner that minimizes the conflicts between surveillance test frequency requirements and plant conditions.

Proposed Alternative

By letter dated May 19, 2015, the licensee describes the proposed alternative:

> Code Case OMN-20 is included in the ASME OM Code, 2009 Edition, and will be used as an alternative to the frequencies of the ASME OM Code. The requirements of Code Case OMN-20 are described below. Period extensions are not intended to be used repeatedly as a mere operational convenience to extend test intervals beyond those specified.
>
> ASME OM Code establishes component test frequencies that are based either on elapsed time periods (e.g., quarterly, two years, etc.) or on the occurrence of plant conditions or events (e.g., cold shutdown, refueling outage, upon detection of a sample failure, following maintenance, etc.).
>
> a. Components whose test frequencies are based on elapsed time periods shall be tested at the frequencies specified in ASME Code Section 1ST with a specified time period between tests as shown in the following table.

Frequency	Specified Time Period Between Tests
Quarterly (or every 3 months)	92 days
Semiannually (or every 6 months)	184 days
Annually (or every year)	366 days
x Years	x calendar years where "x" is a whole number of years ≥ 2

> b. The specified time period between tests may be extended as follows:
>
> i. For periods specified as less than two years, the period may be extended by up to 25% for any given test.
> ii. Period extensions may also be applied to accelerated test frequencies (e.g., pumps in Alert Range) and other less than two year test frequencies not specified in the table above.
> iii. For periods specified as greater than or equal to 2 years, the period may be extended by up to 6 months for any given test.
>
> c. Components whose test frequencies are based on the occurrence of plant conditions or events (e.g., cold shutdown, refueling outage, upon detection of a sample failure, following maintenance, etc.) may not have their period between tests extended except as allowed by the ASME OM Code.

By letter dated September 9, 2015, the licensee clarified their intent to apply OMN-20 to ASME OM Code Cases listed in Regulatory Guide 1.192 Revision 1, "Operation and Maintenance Code Case Acceptability, ASME OM Code."

3.2 NRC Staff Evaluation

Historically, licensees have applied and the NRC staff has accepted the standard TS definitions for IST intervals (including allowable interval extensions) to ASME OM Code-required testing (see Section 3.1.3 of NUREG-1482, Revision 2, "Guidelines for Inservice Testing at Nuclear Power Plants: Inservice Testing of Pumps and Valves and Inservice Examination and Testing of Dynamic Restraints (Snubbers) at Nuclear Power Plants," dated October 2013, ADAMS Accession No. ML13295A020). Recently, the NRC staff reconsidered the allowance of using TS testing intervals and interval extensions for IST not associated with TS SRs. As noted in Regulatory Issue Summary (RIS) 2012-10, "NRC Staff Position on Applying Surveillance Requirements 3.0.2 and 3.0.3 to Administrative Controls Program Tests," dated August 23, 2012 (ADAMS Accession No. ML12079A393), the NRC determined that programmatic test frequencies cannot be extended in accordance with the TS SR 3.0.2. This includes all IST described in the ASME OM Code not specifically required by the TS SRs.

Following this development, the NRC staff sponsored and co-authored an ASME OM Code inquiry and Code Case to modify the ASME OM Code to include TS like test interval definitions and interval extension criteria. The resultant Code Case OMN-20 was approved by the ASME Operation and Maintenance Standards Committee on February 15, 2012, with the NRC representative voting in the affirmative. Code Case OMN-20 was subsequently published in conjunction with the ASME OM Code, 2012 Edition. The licensee proposes to adopt Code Case OMN-20.

Requiring the licensee to meet the ASME OM Code requirements and applicable adopted ASME OM Code Cases, without an allowance for defined frequency and frequency extensions for IST of pumps and valves, results in a hardship without a compensating increase in the level of quality and safety. Based on the prior acceptance by the NRC staff of the similar TS test interval definitions and interval extension criteria, the staff concludes that implementation of the test interval definitions and interval extension criteria contained in ASME OM Code Case OMN-20 is acceptable. Allowing usage of Code Case OMN-20 provides reasonable assurance of operational readiness of pumps and valves subject to the ASME OM Code IST.

3.3 Licensee's Alternative Request RR 5-3

ASME OM Code Requirements:

ISTC-5131, "Valve Stroke Testing," (a), states, "Active valves shall have their stroke times measured when exercised in accordance with paragraph ISTC-3500."

Alternative testing is requested for the following valves:

Valve ID	System	Cat	Class
CV-0944	Component Cooling Water (CCW)	B	3
CV-0977B	CCW	B	3

The proposed alternative identified in this relief request shall be implemented during the fifth 10-year inservice test (IST) interval beginning March 24, 2016.

Reason for Request

By letter dated May 19, 2015, the licensee describes the reason for the request for an alternative:

> Pursuant to 10 CFR 50.55a, "Codes and standards," paragraph (z)(2), relief is requested from the stroke timing requirements of the ASME OM Code, Subsection ISTC, Paragraph ISTC-5131 since compliance with the code requirements is impractical. The basis of the relief request is that the Code requirement presents an undue hardship without a compensating increase in the level of quality and safety.
>
> CV-0944 and CV-0977B are normally open valves, which close on a safety injection signal (SIS). These valves have no remote or local control switch to perform stroke testing. These valves can only be actuated via an SIS. In addition, the valves have no control room indication, which is the location where the SIS actuation testing is initiated from. SIS actuation testing is performed on a quarterly frequency during technical specification surveillance activities. The valves fail closed on loss of instrument air which provides a "fail-safe" capability.
>
> Stroke time testing of these valves results in hardship or unusual difficulty without a compensating increase in the level of quality and safety, based on the following:
>
> 1. Surveillance testing of the SIS is manpower intensive, and involves blocking or bypassing several automatic actuations and must, therefore, be performed in as little time as possible, because, it places the plant in an abnormal operating condition.
>
> 2. The SIS is initiated from the control room, however, position indications for CV-0944 and CV-0977B are located at remote control panel C-105. Coordination between control room activities and C-105 would be difficult since a dedicated operator would need to be positioned at C-105 with a stopwatch. Starting the stopwatch would be based on a verbal command from the control room, which results in an additional reaction time error over and above that introduced by the control room operator. As a result, obtaining a consistent stroke time basis suitable for meaningful trending would be difficult. The information obtained would be of limited use, due to the anticipated wide range of scatter of the data.
>
> The portion of the component cooling water system isolated by these valves is a closed loop. If both valves fail to close, water cannot be isolated to the radioactive waste evaporators (RWEs) and waste gas compressor, C-54. If either valve closes, flow to the RWEs and waste gas compressor, C-54, is isolated.
>
> Compliance with the code requirements would require a modification to change the SIS actuating scheme for the subject valves by adding an open and closed type control switch in the control room or a modification to install control switches

and position indication at the valves locally. These modifications would be used in place of the current surveillance testing and would serve no other practical purpose beyond supporting the ability to perform stroke time testing.

Proposed Alternative

By letter dated May 19, 2015, the licensee describes the proposed alternative:

> CV-0944 and CV-0977B will be tested each quarter during performance of the current technical specification surveillance activities. These surveillance activities will verify that CV-0944 and CV-0977B have traveled to their safety position without measuring stroke time. The fail-safe capability of CV-0944 and CV-0977B will also be verified on a quarterly basis.
>
> This quarterly testing is considered adequate for the following reasons:
>
> 1. These valves are tested in the same manner in which they would be called upon to perform their accident mitigation function.
>
> 2. If either CV-0944 or CV-0977B closes, flow to the RWEs will be isolated.
>
> Based on statements 1 and 2 above, testing without obtaining stroke times is sufficient to assure the ability of these valves to close.
>
> The valves and air actuators for CV-0944 and CV-0977B are within the scope of the air operated valve program. Entergy Nuclear Engineering Programs procedure SEP-AOV-PLP-001, "Air Operated Valve Program," Attachment 1, has identified CV-0944 and CV-0977B as Category 2 air operated valves. The actuators for these valves are subjected to condition assessment following completion of maintenance activities. Should assessment results indicate the need for further valve or actuator maintenance, this maintenance will be planned, scheduled, and performed in accordance with administrative requirements. These program requirements will assure continued operability of these components.

3.4 NRC Staff Evaluation

Valves CV-0944 and CV-0977B are normally open valves, which close on a SIS. There is no position indication in the control room, which is the location from where the SIS activation test is initiated. Stroke time coordination of these valves would result in hardship or unusual difficulty. The portion of the CCW system isolated by these valves is a closed loop. If both of these valves fail to close, water cannot be isolated to the RWEs. If either of these valves close, flow to the RWEs is isolated.

Compliance with the Code requirements would require a modification to change the actuating scheme for the subject valves by adding open and close type control switches in the control room, or a temporary modification to install control switches and position indication at the valves. The modification would be used in place of the controllers for IST, and would serve no other practical purpose beyond creating the ability to perform stroke time testing.

The valves and air actuators for valves CV-0944 and CV-977B are within the scope of the air-operated valve condition assessment program. The actuators for these valves are subjected to condition assessment following completion of maintenance activities. Should assessment results indicate the need for further valve or actuator maintenance, this maintenance will be planned, scheduled, and performed in accordance with administrative requirements.

The NRC staff concludes measuring stroke time using conventional methods presents a hardship or unusual difficulty without a compensating increase in the level of quality and safety. The Code requirement for stroke time testing of power operated valves is intended to monitor for degrading conditions by monitoring for increases in the stroke time that could indicate changes in the valve internals or valve actuator or control system. Imposing the Code requirements would necessitate modifications, such as installation of control switches or position indication at the valves. Therefore, the NRC staff concludes that the proposed alternative which includes quarterly stroke testing, with verification that the valves travel to their safety-related position, and that the valves will fail to the safe position along with inclusion of the valves in the air operated valve condition assessment program, provides reasonable assurance of the operational readiness of valves CV-0944 and CV-0977B.

4.0 CONCLUSION

As set forth above, the NRC staff determines that the proposed alternatives described in RR 5-2 and RR 5-3 provide reasonable assurance that the affected components are 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).

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

Therefore, the NRC staff authorizes the proposed alternatives in requests RR 5-2 and RR 5-3 for the fifth 10-year IST interval at PNP which is currently scheduled to begin on March 24, 2016, and conclude on March 23, 2026.

Principal Contributor: Michael Farnan, NRR

If you have any questions, please contact the Project Manager, Jennivine Rankin at 301-415-1530 or via e-mail at Jennivine.Rankin@nrc.gov.

Sincerely,

/RA/

David L. Pelton, Chief
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-255

Enclosure:
Safety Evaluation

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