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PNP 2016-061

December 20, 2016

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

SUBJECT: Proposed Alternatives - Relief Request Numbers RR 5-4, Weld Reference System, and RR 5-5, Under-Vessel Leakage Examination, Pertaining to Inservice Inspection Related Activities for the Fifth 10-Year Interval

Palisades Nuclear Plant
Docket 50-255
Renewed Facility Operating License No. DPR-20

- References:
1. NRC letter to Entergy Nuclear Operations, Inc., *Palisades Nuclear Plant - Relief Request Number RR 5-1, Proposed Alternative, Extend the Current ASME Code of Record into the Fifth 10-year ISI Interval for ISI Related Activities (CAC No. MF6162)*, dated November 25, 2015 (ADAMS Accession Number ML15320A244)
 2. NRC letter to Nuclear Management Company, LLC, *Palisades Nuclear Plant – Request for Relief from ASME Boiler and Pressure Vessel Code, Section XI, System Leakage Test Prior to Plant Startup Following a Reactor Refueling Outage, Relief Request No. RR 4-5 (TAC No. MD2408)*, dated April 20, 2007 (ADAMS Accession Number ML070790035)
 3. NRC letter to Nuclear Management Company, LLC, *Palisades Nuclear Plant – Request for Relief from ASME Code, Section XI, IWA-2600, Weld Reference System, Relief Request No. RR 4-11 (TAC No. MD2414)*, dated April 30, 2007 (ADAMS Accession Number ML070920029)

Dear Sir or Madam:

Pursuant to Title 10 of the Code of Federal Regulations (CFR) 50.55a(z)(2), *Hardship without a compensating increase in quality and safety*, Entergy Nuclear Operations, Inc. (ENO) hereby requests Nuclear Regulatory Commission (NRC) authorization for the Palisades Nuclear Plant (PNP) of two proposed alternatives, relief request numbers RR 5-4, *Weld Reference System*, and RR 5-5, *Under-Vessel Leakage Examination*. These alternatives are for the remainder of the current fifth 10-year Inservice Inspection (ISI) interval.

The two proposed alternatives were included in a previously authorized relief request to maintain the fourth 10-year ISI interval American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (BPV) Code of record into the fifth 10-year interval for ISI related activities, such as, repair/replacement (R/R), pressure testing (PT), and nondestructive examination (NDE) until December 31, 2017 (Reference 1).

The first relief request, RR 5-4, proposes an alternative to ASME BPV Code, Section XI, Subarticle IWA-2600, *Weld Reference System*, requirements which was authorized for use at PNP for the fourth 10-year ISI interval (Reference 3). The second relief request, RR 5-5, proposes an alternative to the ASME BPV Code, Section XI, Subarticle IWB-2500, Table IWB-2500-1, *Examination Category B-P, All Pressure Retaining Components* and Subsubarticle IWB-5220, *System Leakage Test*, prior to a plant startup following a reactor refueling outage, and was authorized for use at PNP for the fourth 10-year ISI interval (Reference 2). The information provided in the attached requests demonstrates that the code requirement results in hardship without a compensating increase in quality and safety.

The fourth 10-year ISI interval complied with the ASME BPV Code, Section XI, 2001 Edition through the 2003 Addenda. The fifth 10-year ISI interval complies with the ASME BPV Code, Section XI, 2007 Edition through the 2008 Addenda and is the ASME Code of record applicable to the proposed alternative relief requests (RR 5-4 and RR 5-5).

ENO's proposed duration for the above two alternatives is from January 1, 2018 through December 12, 2025, the end of the current fifth 10-year ISI interval.

ENO requests NRC approval by December 31, 2017 to support plans to implement the proposed alternative on January 1, 2018.

Summary of Commitments

This letter contains no new commitments and no revised commitments.

Sincerely,



JAH/jpm

- Attachments:
1. 10 CFR 50.55a, Relief Request Number 5-4, Proposed Alternative in Accordance with 10 CFR 50.55a(z)(2), Weld Reference System
 2. 10 CFR 50.55a, Relief Request Number 5-5, Proposed Alternative in Accordance with 10 CFR 50.55a(z)(2), Under-Vessel Leakage Examination

cc: Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC

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Attachment 1

10 CFR 50.55a

Relief Request Number RR 5-4

Proposed Alternative in Accordance with 10 CFR 50.55a(z)(2)

Weld Reference System

3 pages follow

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Attachment 1
10 CFR 50.55a, Relief Request Number RR 5-4
Proposed Alternative in Accordance with 10 CFR 50.55a(z)(2)
Weld Reference System

1. American Society of Mechanical Engineers (ASME) Code Component(s) Affected

Code Class: ASME Code Class 1 and 2

Component Numbers: Various piping, vessel, and component welds

Code References: ASME Boiler and Pressure Vessel (BPV) Code, Section XI, 2007 Edition through the 2008 Addenda
Subarticle IWA-2600, *Weld Reference System*

Examination Category: Not Applicable

Item Number(s): Not Applicable

Unit/Inspection Interval: Palisades Nuclear Plant (PNP) / Fifth 10-Year Inservice inspection (ISI) Interval
December 13, 2015 – December 12, 2025

2. Applicable Code Edition and Addenda

Entergy Nuclear Operations, Inc. (ENO) started the fifth 10-year ISI interval at PNP on December 13, 2015, and is required to follow the ASME BPV Code, Section XI, 2007 Edition through the 2008 Addenda.

3. Applicable ASME Code Requirements

ASME BPV Code, Section XI, 2007 Edition through the 2008 Addenda, Subarticle IWA-2600, *Weld Reference System*, requires the establishment of a weld reference system for all welds and areas subject to surface or volumetric examination. Each such weld area shall be located and identified by a system of reference points. The system shall permit identification of each weld, location of each weld centerline, and designation of regular intervals along the length of the weld.

4. Reason for Request

The PNP construction permit was issued on March 14, 1967. At that time, the construction code did not require that a weld reference system be established. This included the marking of welds inside ISI boundaries before or during the preservice examination. Therefore the welds at PNP were not marked during plant construction. Therefore the reason for requesting an alternative is that establishing a weld reference system at this point in plant life would result in hardship without a compensating increase in the level of quality and safety.

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10 CFR 50.55a, Relief Request Number RR 5-4
Proposed Alternative in Accordance with 10 CFR 50.55a(z)(2)
Weld Reference System

5. Proposed Alternative and Basis for Use

Proposed Alternative

Pursuant to 10 CFR 50.55a(z)(2), ENO requests authorization to use an alternative to the requirements of the weld reference system as specified in Subarticle IWA-2600. As an alternative to a weld reference system, ENO proposes to implement the following requirements to locate and identify subject weld areas.

ENO will use isometric drawings at PNP to provide a detailed identification and location of each weld requiring examination.

In addition, the following will be performed:

Surface Examinations - Where surface examination is specified, Section XI requires that 100% of the selected weld or area be examined. Unlike the performance of volumetric examination, there is no need to indicate the direction of examination to assure uniformity in reporting results. In these cases, no marks will be placed on the weld or area. The location of any accepted surface indications will be documented by the use of a map or photograph that permits accurate identification of areas on the examination surface.

Volumetric Examinations (Manual) - If a weld is accepted for continued service that contains volumetric indications accepted under the criteria of ASME BPV Code, Section XI, Subarticles IWB-3500, Acceptance Standards, and IWB- 3600, Analytical Evaluation of Flaws, for Class 1 components, or IWC-3500, Acceptance Standards and IWC-3600, Analytical Evaluation of Flaws, for class 2 components, then the indications will be identified by appropriate reference marks to ensure that the indications can be located during subsequent examinations. At PNP, the reference marks may be permanently fixed on the weld, or documented on a map or photograph of the weld or the component surface, in order to accurately locate areas on the examination surface (e.g., reference points, orientation and/or proximity to other welds) where volumetric indications were previously discovered. This method positively identifies the weld or area in question and determines the examination starting point. Further, the examination starting point is established by using a zero reference point as instructed by written guidance.

Volumetric Examination (Automated Vessel) - The automated vessel tool establishes its examination location using an existing zero reference point on the reactor vessel. The zero reference point allows the tool to repeat examinations in the same location without the need for an additional reference system. The automated vessel tool determines its location by the use of an electronic encoder system which provides reasonable assurance of repeatability.

Basis for Use

Establishment of a weld reference system in accordance with Subarticle IWA-2600 cannot be practically attained based on the number and location of the welds. To meet the Subarticle IWA-2600 requirements, each and every weld within the ISI boundary would have to be accessed in order to install permanent markings using low stress stamps or

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Proposed Alternative in Accordance with 10 CFR 50.55a(z)(2)
Weld Reference System

vibratooling, or both. The majority of the subject welds are located in radiation areas and covered under insulation. Therefore, accessing them for the sole purpose of installing the required markings would require significant man-hours in radiation areas, resulting in unnecessary high radiation exposure to workers without a compensating increase in the level of quality and safety.

The methods and additional examination requirements listed above and currently used at PNP to locate and identify subject welds have performed satisfactorily in all previous ISI intervals. The locations of indications have repeatedly been positively identified using these methods. Therefore, this proposed alternative maintains an acceptable level of quality and safety.

6. Duration of Proposed Alternative

The proposed alternative was included in a previously authorized relief request to maintain the fourth 10-year interval ASME BPV code of record into the fifth 10-year interval for ISI related activities such as repair/replacement (R/R), pressure testing (PT), and nondestructive examination (NDE) until December 31, 2017. Therefore, the proposed duration of this alternative is for the remainder of the fifth 10-year ISI interval from January 1, 2018 through December 12, 2025.

7. Precedent

NRC letter to Nuclear Management Company, LLC, *Palisades Nuclear Plant – Request for Relief from ASME Code, Section XI, IWA-2600, Weld Reference System, Relief Request No. RR 4-11 (TAC No. MD2414)*, dated April 30, 2007 (ADAMS Accession Number ML070920029)

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Attachment 2

10 CFR 50.55a

Relief Request Number RR 5-5

Proposed Alternative in Accordance with 10 CFR 50.55a(z)(2)

Under-Vessel Leakage Examination

3 pages follow

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Attachment 2
10 CFR 50.55a, Request Number RR 5-5
Proposed Alternative in Accordance with 10 CFR 50.55a(z)(2)
Under-Vessel Leakage Examination

1. American Society of Mechanical Engineers (ASME) Code Component(s) Affected

Code Class: ASME Code Class 1

Component Numbers: N-50, Reactor Vessel, Alternative Testing for Components Under the Reactor Vessel¹

Code References: ASME Boiler and Pressure Vessel (BPV) Code, Section XI, 2007 Edition through the 2008 Addenda
Subarticle IWB-2500, Table IWB-2500-1, Examination Category B-P, All Pressure Retaining Components
Subsubarticle IWB-5220, System Leakage Test

Examination Category: B-P

Item Number(s): B15.10

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¹The PNP reactor vessel has no bottom penetrations.

2. Applicable Code Edition and Addenda

Entergy Nuclear Operations, Inc. (ENO), started the fifth 10-year Inservice Inspection (ISI) program interval at PNP on December 13, 2015, and is required to follow the ASME BPV Code, Section XI, 2007 Edition through the 2008 Addenda.

3. Applicable ASME Code Requirements

ASME BPV Code, Section XI, 2007 Edition through the 2008 Addenda, Subarticle IWB-2500, *Examination and Pressure Test Requirements*, Table IWB-2500-1, Examination Category B-P, Item Number B15.10 requires a visual examination during system leakage test in accordance with Subsubarticle IWB-5220, *System Leakage Test*, prior to plant startup following a reactor refueling outage.

4. Reason for Request

In order to perform the ASME BPV code required reactor vessel system leakage direct visual testing (VT-2), the area under the PNP reactor vessel would have to be accessed by workers. This area is extremely hazardous when the plant is in Mode 3, *Hot Shutdown*, which are the conditions required for system leakage testing. This alternative is requested on the basis that the resultant radiation exposure and industrial hazards experienced by the workers to perform this inspection under the Code required system conditions would result in hardship without a compensating increase in the level of quality and safety.

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10 CFR 50.55a, Request Number RR 5-5
Proposed Alternative in Accordance with 10 CFR 50.55a(z)(2)
Under-Vessel Leakage Examination

5. Proposed Alternative and Basis for Use

Proposed Alternative

Pursuant to 10 CFR 50.55a(z)(2), ENO requests authorization to use an alternative, at PNP, to the reactor vessel system leakage testing requirements specified in Subsubarticle IWB-5220. As an alternative to the required system leakage VT-2, ENO proposes the following primary coolant system (PCS) leakage monitoring and remote visual examinations.

ENO will determine leakage from PNP piping and components in the area under the reactor vessel in accordance with Paragraph IWA-5244, *Buried Components*, of ASME BPV Code Section XI 2007 Edition through 2008 Addenda. This requirement will be satisfied by PNP Technical Specification (TS) Surveillance Procedure DWO-1, *Operator's Daily/Weekly Items Modes 1, 2, 3, and 4*, which documents performance of a PCS leakage calculation to satisfy TS surveillance requirement (SR) 3.4.13.1. This SR requires PCS leak rate calculation on a 72-hour frequency. PNP TS 3.4.13, *PCS Operational Leakage*, limits unidentified PCS leakage to less than 1 gpm and if the source of the leakage is not identified, requires reduction of the leakage to less than 1 gpm within 4 hours, or the reactor must be placed in Mode 3 within the following 6 hours and in Mode 5, *Cold Shutdown*, within the following 36 hours. Additionally, if the unidentified leakage determined by the performance of DWO-1 is greater than 0.15 gpm, over a 3 hour leakrate test, at stable plant conditions, Abnormal Operating Procedure (AOP)-23, *Primary Coolant Leak*, is required to be performed to determine the source of leakage and to take appropriate actions. These limits were approved as documented in PNP renewed facility operating license DPR-20, through license amendment No. 260 and are applicable at all times when the PCS is greater than Mode 5.

Additionally, ENO will perform a remote visual examination of the area under the PNP reactor vessel once per refueling outage. This examination will document active leakage or evidence of leakage which may have occurred during the previous power cycle.

Based on the above listed alternative methods, ENO has determined that this proposed alternative reasonably maintains an acceptable level of quality and safety.

Basis for Use

Performing the system leakage VT-2 examination under the PNP reactor vessel per ASME BPV Code, Section XI, Subsubarticle IWB-5220 would be required in Mode 3 prior to plant startup following a reactor refueling outage. With the plant at full pressure and temperature in Mode 3, performance of the VT-2 examination would be extremely hazardous to workers. Radiation levels under the reactor vessel are expected to be 2.5 rem per hour (on contact), which is the maximum measured during cold shutdown. This area would conservatively have general area radiation levels approximately equivalent to the reactor cavity, where the dose rates are typically 1.5 to 2 rem per hour during this plant mode. Therefore, assuming two persons in this area at one-half hour per person, a total exposure of 1.5 to 2 rem would be received each time the examination is performed.

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Under-Vessel Leakage Examination

In addition to radiation concerns, access to the area under the reactor vessel involves various industrial hazards. Two significant hazards to the workers are that the only inspection area access is through a tube 30 inches in diameter, making this area a confined space with a high ambient air temperature that creates a heat stress environment. Ambient air temperatures with the primary coolant system at full temperature are expected to be approximately 300 degrees Fahrenheit. Access under these conditions would require significant ventilation to alleviate the high ambient air temperatures. However, since the access tube must remain unobstructed to allow for inspection personnel ingress and egress, the available space within the access tube for ventilation ductwork is limited. Therefore, Subsubarticle IWB-5520 pressure testing will result in hardship without a compensating increase in the level of quality and safety.

6. Duration of Proposed Alternative

The proposed alternative was included in a previously authorized relief request to maintain the fourth 10-year interval ASME BPV Code of Record into the fifth 10-year interval for ISI related activities such as repair/replacement (R/R), pressure testing (PT), and nondestructive examination (NDE) until December 31, 2017. Therefore, the proposed duration of this alternative is for the remainder of the PNP's 5th 10-year ISI interval from January 1, 2018 through December 12, 2025.

7. Precedent

NRC letter to Nuclear Management Company, LLC, *Palisades Nuclear Plant – Request for Relief from ASME Boiler and Pressure Vessel Code, Section XI, System Leakage Test Prior to Plant Startup Following a Reactor Refueling Outage, Relief Request No. RR 4-5 (TAC No. MD2408)*, dated April 20, 2007 (ADAMS Accession Number ML070790035)