



Entergy Nuclear Operations, Inc.
1340 Echelon Parkway
Jackson, MS 39213
Tel. 601-368-5573

Mandy K. Halter
Director, Nuclear Licensing

NL-18-052

July 23, 2018

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

SUBJECT: Relief Request IP3-ISI-RR-14, Proposed Alternative to ASME Code
Case N-729-4 Examination Requirements

Indian Point Nuclear Generating Unit No. 3
Docket No. 50-286
License No. DPR-64

- REFERENCES:
1. NRC Letter and Safety Evaluation (SE), "Indian Point Nuclear Generating Unit No. 3 - Relief from the Examination Area for Reactor Vessel Head Penetration Nozzles (TAC NO. ME3017)," dated October 1, 2010 (ML102590213)
 2. NRC Letter and SE, "Indian Point Nuclear Generating Unit No. 2 – Safety Evaluation for Relief Request IP2-ISI-RR-05 Alternative Examination Volume Required by ASME Code Case N-729-4 (EPID L-2017-LLR-0157)," dated March 6, 2018 (ML18059A156)

Dear Sir or Madam:

Pursuant to 10 CFR 50.55a(z)(2), Entergy Nuclear Operations, Inc. (Entergy) is submitting the enclosed Relief Request No. 14, IP3-ISI-RR-14, for Indian Point Nuclear Generating Unit No. 3 (IP3) to use an alternative to the 2001 Edition with the 2003 Addenda of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (BPV) Code, Section XI, as augmented by ASME Code Case N-729-4 requirements, with limitations/modifications for use as stated in 10 CFR 50.55a (g)(6)(ii)(D)(2). This relief request is for the Fourth Ten-Year Inservice Inspection (ISI) Interval.

This relief request is similar to IP3-ISI-RR-04 which was previously approved by the NRC (Reference 1) except that it updates the applicable revision of the ASME Code Case from N-729-1 to N-729-4, as required by 10 CFR 50.55a(g)(6)(ii)(D). This relief request is also identical to Relief Request IP2-ISI-RR-05 approved by the NRC for Indian Point Nuclear Generating Unit No. 2 (Reference 2).

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This letter contains no new regulatory commitments.

Approval of this relief request is requested by July 23, 2019.

If you have any questions or require additional information, please contact Mr. Robert Walpole, Manager, Regulatory Assurance at (914) 254-6710.

Sincerely,

Handwritten signature of Mandy K. Halter in cursive script.

MKH/rww/aye

Attachment: Indian Point Nuclear Generating Unit No. 3, 10 CFR 50.55a Request No. IP3-ISI-RR-14, Proposed Alternative in Accordance with 10 CFR 50.55a(z)(2) Examination Volume Required by Code Case N-729-4

cc: Mr. Richard Guzman, Senior Project Manager, NRC NRR DORL
Mr. David Lew, Acting Regional Administrator, NRC Region 1
NRC Resident Inspector's Office
Ms. Alicia Barton, President and CEO, NYSERDA
Ms. Bridget Frymire, New York State Public Service Commission

ATTACHMENT TO NL-18-052

**Indian Point Nuclear Generating Unit No. 3
10 CFR 50.55a Request No. IP3-ISI-RR-14
Proposed Alternative in Accordance With 10 CFR 50.55a(z)(2)
Examination Volume Required by Code Case N-729-4**

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 3
DOCKET NO. 50-286

**Indian Point Nuclear Generating Unit No. 3
10 CFR 50.55a Request No. IP3-ISI-RR-14
Proposed Alternative in Accordance With 10 CFR 50.55a(z)(2)
Examination Volume Required by Code Case N-729-4**

1. ASME COMPONENT IDENTIFICATION

Code Class: 1
References: Code Case N-729-4
Examination Category: Not Applicable
Item Number: B4.20 in Table 1 of Code Case N-729-4
Description: Code Case N-729-4 Examination Volume

2. APPLICABLE ASME CODE & 10 CFR 50.55a REQUIREMENTS

The code of record for the Indian Point Unit 3 (IP3) Inservice Inspection (ISI) Fourth Ten-Year Interval is the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (BPV) Code, Section XI, 2001 Edition, including the 2003 Addenda, as augmented by ASME Code Case N-729-4, with limitations/modifications for use as stated in 10 CFR 50.55a(g)(6)(ii)(D)(2).

Code Case N-729-4, Section 2500 states that components shall be examined as specified in Table 1 of Code Case N-729-4 and if obstructions or limitations prevent examination of the volume or surface required by Figure 2 for one or more nozzles, the analysis of Mandatory Appendix I, "Analysis Procedure for Alternative Examination Area or Volume Definition," shall be used to demonstrate the adequacy of the examination volume or surface of each nozzle. 10 CFR 50.55a(g)(6)(ii)(D)(2) states that Mandatory Appendix I of ASME Code Case N-729-4 shall not be implemented without prior NRC approval.

Code Case N-729-4, Figure 2, "Examination Volume for Nozzle Base Metal and Examination Area for Weld and Nozzle Base Metal," identifies the examination volume or surface as "a = 1.5 in. (38 mm) for Incidence Angle, θ , ≤ 30 deg and for all nozzles ≥ 4.5 in. (115 mm) OD or 1 in. (25 mm) for Incidence Angle, θ , > 30 deg; or to the end of the tube, whichever is less."

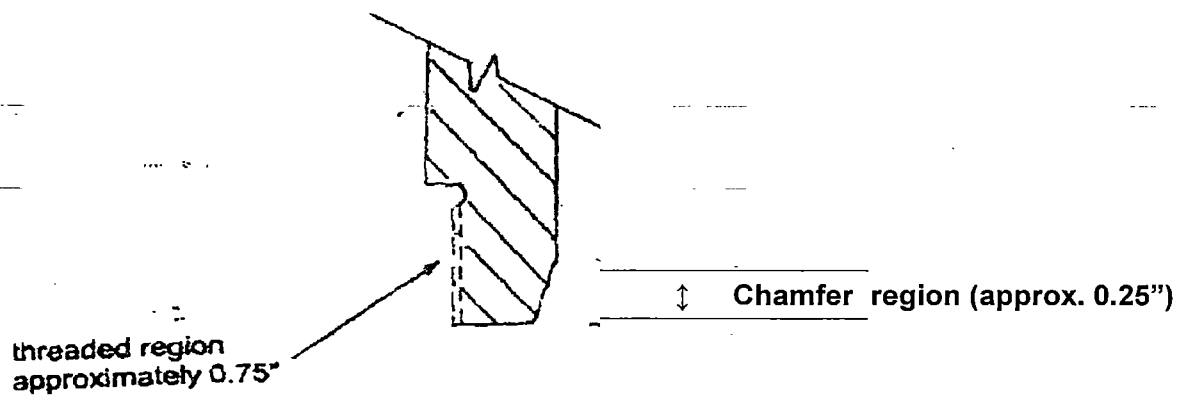
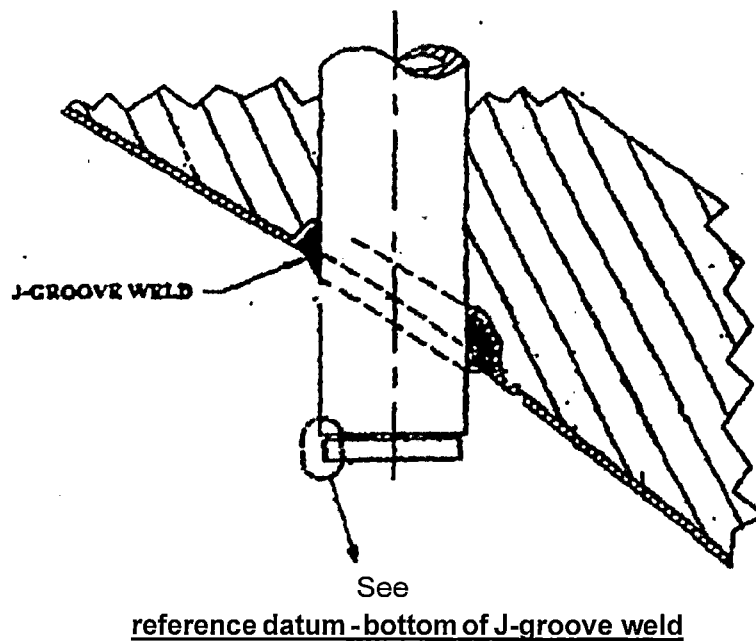
3. REASON FOR REQUEST

The design of the IP3 Reactor Pressure Vessel (RPV) head penetration nozzles (see Figure 1) includes a threaded section, approximately 0.75 inches long, at the bottom of the nozzles. The dimensional configuration at some nozzles is such that the inspectable distance from the lowest point of the toe of the J-groove weld to the bottom of the scanned region is less than the 1-inch and 1.5-inch lower boundary limits as defined in Figure 2 of ASME Code Case N-729-4. There is no current qualified volumetric inspection technique to interrogate the physical geometry of the threaded region at the nozzle end. Inspection by surface examination techniques is an available option to meet the current regulatory requirement; However, radiation dose rates under the RPV head near the J-groove weld areas are expected to be in the 3 to 5 Rem/hour range.

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Examination Volume Required by Code Case N-729-4**

Additionally, the area under the head is posted as a locked high radiation area and high contamination area. Therefore, performance of the required examination is considered a hardship without a compensating increase in the level of quality and safety, as described in 10 CFR 50.55a(z)(2).

Figure 1



Indian Point Nuclear Generating Unit No. 3
10 CFR 50.55a Request No. IP3-ISI-RR-14
Proposed Alternative in Accordance With 10 CFR 50.55a(z)(2)
Examination Volume Required by Code Case N-729-4

The following list identifies the RPV head penetrations for which the requirements of Figure 2 cannot be met and for which relief is requested: Based on RPV head penetration examinations from IP3 Refueling Outage 14 (3R14) to 3R19, penetrations 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, and 37, do not meet the 1.5-inch examination volume criterion specified in Code Case N-729-4 for an incident angle of less than or equal to 30 degrees and penetrations 38, 41, 42, 43, 44, 46, 47, 48, 52, 55, 56, 61, 62, 65, 67, 68, 70, 71, 72, 73, 74, 75, 76, 77, and 78 do not meet the 1-inch examination volume criterion specified in ASME Code Case N-729-4 for an incident angle of greater than 30 degrees.

Based on RPV head penetration examinations performed from 3R14 to 3R19, the examination volume coverage for penetrations 40, 49, 50, 53, 54, 57, 58, 60, 64, 66 were measured to be within 0.080 inches of the examination volume criterion. Relief is also requested for these penetrations due to the potential that the examination volume criterion cannot be met.

4. PROPOSED ALTERNATIVE AND BASIS FOR USE

Pursuant to 10 CFR 50.55a(z)(2), use of an alternative to Figure 2 of ASME Code Case N-729-4 is requested. An alternative examination volume to that defined in Figure 2 of the ASME Code Case will be used. The relaxed volume, based upon flaw analysis (References 1 and 2), is the same volume used in the Fourth Ten-Year ISI Interval and previously approved by the NRC (Reference 3). The alternative examination volume provides reasonable assurance of structural integrity and compliance with the ASME Code requirements would result in hardship without a compensating increase in level of quality and safety. The alternative examination volume and basis follows.

IP3 will perform qualified volumetric examinations (UT) in accordance with 10 CFR 50.55a for circumferential and axial flaw detection from the inside surface of each applicable RPV head penetration nozzle from 1 inch and 1.5 inches above the J-groove weld (i.e., the upper boundary limits defined in Figure 2 of Code Case N-729-4) and extending down the nozzle to at least the top of the threaded region. Table 1 provides the minimum inspection coverage required to ensure that a postulated axial through-wall flaw in the un-inspected area of the Control Rod Drive Mechanism (CRDM) penetration nozzle will not propagate into the pressure boundary formed by the J-groove weld prior to a subsequent inspection (i.e. two Effective Full Power Years, EFPY). The time estimates are more than the time between successive inspections. This exam provides reasonable assurance that structurally significant flaws will not exist at or above the weld root and assure that operation between refueling outages can be accomplished without pressure boundary leakage from the examined nozzles. Reference 1 provides the supporting flaw analysis information used in developing Table 1.

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Examination Volume Required by Code Case N-729-4**

Note that the UT examination volume coverage to "at least the top of the threaded region" meets or exceeds the requirements listed in Table 1 for each nozzle for which relief is requested.

**TABLE 1
IP3 RPV Head Penetrations - Minimum Inspection Coverage Requirements Below the
J-Groove Weld to Ensure Structural Integrity and Leak Tightness Between Inspections**

Nozzle Penetration No.	Angle of Incidence (Degrees)	⁽¹⁾ Minimum Required UT Coverage Below J-Groove Weld with > 2 EFPY by Crack Growth Evaluation (Inches)	Time (EFPY) to Reach the Lowest Point of the Toe of the J-Groove Weld
1 through 29	0.0 to 24.8	0.4	3.0
30 through 37	26.2	0.4	2.7
38 through 69	30.2 to 38.6	0.4	2.7
70 through 73	44.3	0.3	3.0
74 through 78	48.7	0.3	4.2
Note:			
(1) Length below the lowest point at the toe of the J-groove weld (downhill side) that has an operating stress level of 20 ksi: 0.86 inches at nozzles 1 through 29; 0.50 inches at nozzles 30 through 69; 0.35 inches at nozzles 70 through 73; and 0.35 inches at nozzles 74 through 78.			

Entergy has verified that the inspection system used by the UT inspection vendor is qualified in accordance with Section 2500 requirements of ASME Code Case N-729-4 for circumferential and axial flaw detection below the J-groove weld extending to the distance specified in Table 1.

5. DURATION OF PROPOSED ALTERNATIVE

Relief is requested for the Fourth Ten-Year ISI Interval starting June 21, 2009 and currently scheduled to end July 20, 2020.

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6. PRECEDENTS

1. NRC Letter and Safety Evaluation (SE), "Indian Point Nuclear Generating Unit No. 3 - Relief from the Examination Area for Reactor Vessel Head Penetration Nozzles (TAC NO. ME3017)," dated October 1, 2010 (ML102590213)
2. NRC Letter and SE, "Indian Point Nuclear Generating Unit No. 2 – Safety Evaluation for Relief Request IP2-ISI-RR-05 Alternative Examination Volume Required by ASME Code Case N-729-4 (EPID L-2017-LLR-0157)," dated March 6, 2018 (ML18059A156)

7. REFERENCES

1. Entergy Letter NL-09-163, "Relief Request IP3-ISI-RR-04 For Fourth Ten-Year Inservice Inspection Interval," dated December 23, 2009 (ML100050207)
2. Entergy Letter NL-09-130 "Response to Request for Additional Information for Fourth Ten-Year Inservice Inspection Interval (TAC No. ME1658)," dated September 24, 2009 (ML092800242)
3. NRC Letter and SE, "Indian Point Nuclear Generating Unit No. 3 - Relief from the Examination Area for Reactor Vessel Head Penetration Nozzles (TAC NO. ME3017)," dated October 1, 2010 (ML102590213)