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Anthony J Vitale  
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NL-16-133

November 7, 2016

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

SUBJECT: Request for Relief Request IP3-ISI-RR-10 Alternative to the Full Circumferential Inspection Requirement of Code Case N-513-3  
Indian Point Unit Number 3  
Docket No. 50-286  
License No. DPR-64

Dear Sir or Madam:

Pursuant to 10 CFR 50.55a(z)(2), Entergy Nuclear Operations, Inc. (Entergy) requests relief to use an alternative to the 2001 edition with the 2003 Addenda of ASME Section XI. Specifically, Entergy proposes to use ASME Code Case N-513-3 "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1", approved as conditionally acceptable in Regulatory Guide 1.147, with relief for the requirement to perform a full pipe circumferential inspection. This relief request is for the Fourth 10-year ISI Interval and Second Inspection Period, and will extend until Indian Point Unit No. 3 (IP3) is shutdown for the 3R19 refueling outage in March 2017 or the flaw size exceeds the acceptance criteria.

This relief request is to be used for the evaluation of a through wall flaw identified in a 3 inch service water line using Code Case N-513-3. The service water line is Class 3 moderate energy piping and Entergy will continue to apply all the requirements of Code Case N-513-3 for which relief is not requested. Entergy requests this relief request in accordance with 10 CFR 50.55a(z)(2) whose requirements are as follows:

(z) *Alternatives to codes and standards requirements.* 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 that:

(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 the level of quality and safety.

AD47  
NRR

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

Sincerely,

A handwritten signature in black ink, appearing to read "Amy H. White". The signature is fluid and cursive, with the first name "Amy" being more prominent than the last name "White".

LC/sp

Attachment: 10 CFR 50.55a Request No. IP3-ISI-RR-10 Proposed Alternative in Accordance  
With 10 CFR 50.55a(z)(2)

Enclosure: IP-CALC-16-00079 FCU 31 SW Leak

cc: Mr. Douglas Pickett, Senior Project Manager, NRC NRR DORL  
Mr. Daniel H. Dorman, Regional Administrator, NRC Region 1  
NRC Resident Inspectors Office  
Mr. Francis J. Murray, Jr., President and CEO, NYSERDA  
Ms. Bridget Frymire, New York State Dept. of Public Service

ATTACHMENT TO NL-16-133

10 CFR 50.55A REQUEST NO. IP3-ISI-RR-10  
PROPOSED ALTERNATIVE IN ACCORDANCE  
WITH 10 CFR 50.55a(z)(2)

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

**Indian Point Unit 3**  
**Fourth 10-year ISI Interval**  
**Relief Request No: IP3-ISI-RR-10**  
**Alternative to the Full Circumferential Inspection Requirement of Code**  
**Case N-513-3**

**Proposed Alternative In Accordance with 10 CFR 50.55a(z)(2)**  
**-Hardship Without a Compensating Increase in Quality and Safety-**

**1. 1. ASME Code Component(s) Affected**

Code Class: 3  
Item Number: Weld B297  
Description: Service water piping butt weld on 3-inch return piping associated with the number 31 Fan Cooler Unit  
Nominal Wall Thickness: 0.216 inches  
Design Pressure (Max): 150 pounds per square inch gauge (psig)  
Design Temperature (Max): 169 degrees Fahrenheit (°F)  
Material of Construction: Haynes Alloy 20 (UNS N08320) or 904L Stainless Steel (UNS N08904)  
Weld Filler Metal: ASME SFA 5.11 ENiCrMo-1 or ASME SFA 5.14 ERNiCrMo-1  
Internal Linings: None

**2. Applicable Code Edition and Addenda**

The code of record for the Indian Point Unit 3 Inservice Inspection Fourth Interval is the ASME Section XI Code, 2001 Edition, 2003 Addenda.

**3. Applicable Code Requirement**

Articles IWD-3120 and IWD-3130 require that flaws exceeding the defined acceptance criteria be corrected by repair / replacement activities or be evaluated and accepted by analytical evaluation. ASME Code, Section XI, IWD-3120(b) requires that components exceeding the acceptance standards of IWD-3400 be subject to supplemental examination, or to a repair / replacement activity. Evaluation and acceptance using ASME Section XI, Code Case N-513-3, Paragraph 2(a) requires the full circumference of the pipe to be inspected at the flaw location to characterize the length and depth of all flaws in the pipe section.

**4. Reason for Request**

ASME Code Case N-513-3, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping, Section XI, Division 1," is shown as conditionally acceptable for use in

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Regulatory Guide (RG) 1.147, Revision 17, dated August 2014. This code case provides alternatives to the requirements of IWD-3120(b), which requires that components exceeding the acceptance standards of IWD-3400 be subject to supplemental examination, or to a repair or replacement activity. The RG 1.147 condition on the code case requires that the repair or replacement activity temporarily deferred shall be performed during the next scheduled outage (i.e., refueling outage 3R19).

On November 3, 2016, Entergy detected a pinhole through-wall leak in the three inch Indian Point 3 (IP3) 31 Fan Cooler Unit (FCU) service water return line, located inside the Vapor Containment building. The leak is located on weld B297, line number 12B. The leak was initially identified due to an increase in the sump pump rate indicating a leak rate of about 0.16 gpm. The normal service water operating pressure is 90 psig but it will be lower at the location of the leak because the FCU is located in one of the highest points of the system and the downhill discharge causes a pressure reduction to approximately 7 to 10 psig. The operating temperature will be based on the river water temperature whose design value is 95°F. The river is currently below 70°F and will remain lower during the period until the next refueling outage. There is some small increase in the outlet temperature due to containment cooling.

Entergy ultrasonically inspected approximately 70 percent of the circumference of the weld, however the remaining 30 percent (approximately 3 inches) was unable to be inspected due to space constraints between the weld and the adjacent fan cooler unit plenum wall. Field measurements indicate the distance between the two components is 0.2 inches at the narrowest point. Therefore, the requirement to inspect the full circumference of the pipe of Code Case N-513-3 is not possible due to interference.

The service water piping to the 31 FCU must be isolated when an allowable leakage is exceeded. The Technical Specification (TS) 5.5.15 allowable leakage is  $\leq 0.36$  gpm in order to assure containment level is limited to an acceptable level. The maximum leakage to assure that the post-accident containment leakage remains within allowable limits is 0.023 gpm (about 30 drops per second). This limit is based upon an evaluation to calculate the amount of Service Water (SW) which can leak through this pin hole under normal system operating conditions to ensure that the 10CFR50 Appendix J containment leakage limits are not exceeded under any mode of operation including accident conditions. The leak does not impinge upon any safety related equipment, as a result, no damage for the leakage is expected to occur. Approval of the relief request will allow Entergy to re-establish service water to the FCU to verify that leakage limits are met using a

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qualified clamp over the pin hole leak. The leakage will be inspected daily in accordance with the Code Case N-513-3 requirements.

The basis for hardship is the requirements of Technical Specification 3.6.6. Condition C states the an inoperable containment fan cooler unit must be restored to operable status within 7 days or the plant must be in Mode 3 within 6 hours and Mode 4 within 12 hours. Relief is required in order to apply Code Case N-513-3 to evaluate the leak for operability. The evaluation (Enclosure) demonstrates that there is no decrease in quality and safety because the acceptance criteria of the Code Case are met. An online repair was not considered practical because of the amount of time required (preparation of a modification package and partial disassembly of the FCU to allow welding) and the potential for excessive sump filtration loading due to the amount of equipment which would both increase the risk level.

**5. Proposed Alternative and Basis for Use**

Entergy proposes to use Code Case N-513-3, meeting all the requirements of the Code Case and the Regulatory Guide 1.147 condition on the Code Case except for the requirement to inspect the full pipe circumference at the flaw location as required by Paragraph 2(a). As an alternative, Entergy proposes that just accessible locations on the pipe circumference be inspected.

NDE Report IP3-UT-16-035 (Enclosure) provides a detailed UT mapping of the area immediately around the pinhole leak. The UT data characterized the flaw at the leak location and verified that the flaw could be treated as a single flaw with respect to the proximity of other thinned regions. The UT report noted that the flaw could be characterized as a nonplanar flaw. UT readings at the site of the leak and surrounding areas indicate acceptable wall thicknesses. Based on the UT test data the flaw is characterized as a through-wall pinhole leak rather than a leak originating from general area thinning, meaning that the indication will not propagate from its location since wall thinning is not a contributor to the flaw.

**Basis for Use**

The proposed alternative provides an acceptable level of quality and safety for the following reasons:

- The pipe adjacent to weld B297 was evaluated for structural integrity for general wall thinning. The structural evaluation (Attachment 2) determined that the minimum required

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wall thickness is 0.073 inches, which is below the minimum measured thickness of 0.117 inches. Any reading below .073 inches would be considered to be a thru wall flaw. The maximum allowable axial flaw size is 4.11 inches and maximum allowable circumferential flaw size is 3.65 inches. Based on the calculation, the existing flaw is conservatively characterized to be contained within an approximate area of 0.5 inches by 0.5 inches which is bound by the axial and circumferential limits mentioned here. This is conservative since the actual flaw is a small pinhole and the lowest reading on the pipe was obtained when the probe was placed at the leak and recorded the .117 inch reading. The flaw size was conservatively taken using administrative wall thinning values of 30% of the pipe wall. Approximately 3 inches of the pipe circumference is inaccessible for UT measurements. While it could be inferred that this portion is sound based on the consistency of UT results, consideration of this approximate 3 inch portion as a flaw would still be within the allowable limits. The pinhole leak is opposite the inaccessible area, so the flaw areas would be independent and not additive in size.

- Entergy has performed five extent of condition inspections as required by Paragraph 5(a) of Code Case N-513-3. The five locations that were examined are weld numbers B298, B299, B300, B301, B302 – all located on the same service water return line. These additional inspections confirm the integrity of the piping where all UT data measurements are above the 87.5% of the pipe nominal wall thickness. The data is consistent and does not indicate any degradation above the normal baseline.
- The activities included in the relief request are subject to third party review by the Authorized Nuclear In-service Inspector.
- The remaining N-513-3 requirements are or will be met as follows:
  - (a) Entergy will perform a permanent repair or replacement in accordance with IWA-4000 prior to the end of the next scheduled outage.
  - (b) Daily walkdowns will be conducted to confirm that the analysis conditions used in the evaluation remain valid.
  - (c) Periodic ultrasonic inspections will be conducted at no more than 90 day intervals to verify the flaw growth analysis predictions.

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- (d) The weld location qualifies as straight pipe since it connects the straight pipe to the elbow.

**6. Duration of Proposed Alternative**

Relief is requested for the Fourth Ten Year Interval and Second Period until shutdown for refueling outage 3R19 (March 2017) or the flaw size exceeds the acceptance criteria. . If the flaw size exceeds the maximum allowable axial flaw size of 4.11 inches, the maximum allowable circumferential flaw size of 3.65 inches, or the flaw grows into the elbow beyond the applicability limits provided in paragraph 1(c) of ASME Code Case N-513-3, Entergy will repair the defect or request additional relief.

**7. Precedents**

Other relief requests for Code Case N-513-3 have been previously approved although none on the specific issue for IP3. These are:

1. Duke Energy Carolinas, LLC letter to NRC dated August 18, 2016, "McGuire Nuclear Station, Unit 1 – Proposed Relief Request Serial #16-MN-003 for Alternative Repair of Nuclear Service Water System Piping (CAC NO. MF8269)," (ML16224A806).
2. Omaha Public Power District letter to NRC dated August 15, 2014, "Fort Calhoun Station, Unit No. 1 Relief Request RR-14 for Temporary Acceptance of a Pinhole Leak in a Raw Water System Piping Elbow" (ML14230A157).
3. Entergy Operations, Inc. letter to NRC dated October 31, 2014, "Arkansas Nuclear One, Unit 2 – Relief Request ANO2-ISI-017, Alternative to ASME Code, Section XI Requirements (TAC No. MF5107)," (ML14309A188).

**8. References**

1. ASME Code Case N-513-3, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1," Cases of the ASME Boiler and Pressure Vessel Code, January 26, 2009
2. ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," 2001 Edition, 2003 Addenda