

October 9, 2008

Vice President, Operations
Entergy Nuclear Operations, Inc.
Indian Point Energy Center
450 Broadway, GSB
P.O. Box 249
Buchanan, NY 10511-0249

SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT NO. 2 - REQUEST FOR
ADDITIONAL INFORMATION REGARDING RELIEF REQUEST ON WELD
COVERAGE (TAC NO. MD8416)

Dear Sir or Madam:

On March 26, 2008, Entergy Nuclear Operations, Inc. (Entergy), submitted a relief request for Indian Point Nuclear Generating Unit No. 2 which requested relief for not achieving 100% coverage during volumetric examination of certain welds during the third 10-year inservice inspection interval, which ended on March 1, 2007.

The U.S. Nuclear Regulatory Commission staff is reviewing the submittal and has determined that additional information is needed to complete its review. The specific questions are found in the enclosed request for additional information (RAI). On October 2, 2008, the Entergy staff indicated that a response to the RAI would be provided within 45 days of the date of this letter.

Please contact me at (301) 415-2901 if you have any questions on this issue.

Sincerely,

/RA/

John P. Boska, Senior Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-247

Enclosure:
RAI

cc w/encl: Distribution via ListServ

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REQUEST FOR ADDITIONAL INFORMATION
REGARDING THE THIRD 10-YEAR INSPECTION INTERVAL
REQUEST FOR RELIEF RR-CRV-75
ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 2
DOCKET NO. 50-247

1. SCOPE

By letter dated March 26, 2008, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML080920717), Entergy Nuclear Operations, Inc. (Entergy, the licensee), submitted Request for Relief RR-CRV-75 from requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," for Indian Point Nuclear Generating Unit No. 2 (IP2). The request for relief applies to the third 10-year inservice inspection (ISI) interval, which ended on March 1, 2007, in which IP2 adopted the 1989 Edition of ASME Code Section XI as the code of record.

In accordance with Title 10, Part 50 of the Code of Federal Regulations (CFR), 10 CFR 50.55a(g)(5)(iii), the licensee has submitted request for relief RR-CRV-75 for certain Class 1 and Class 2 component weld examinations. The ASME Code requires that 100% of the examination volumes described in ASME Code, Section XI, Tables IWB-2500-1 and IWC-2500-1 be completed. The licensee has claimed that 100% of the ASME Code-required volumes are impractical to obtain at IP2. 10 CFR 50.55a(g)(5)(iii) states that when licensees determine that conformance with ASME Code requirements are impractical at their facility, they shall submit information to support this determination. The NRC will evaluate such requests based on impracticality, and may impose alternatives, giving due consideration to public safety and the burden imposed on the licensee.

The U.S. Nuclear Regulatory Commission (NRC) staff and NRC contractors are reviewing the submittal and have the following questions.

2. REQUEST FOR ADDITIONAL INFORMATION

2.1 Request for Relief RR-CRV-75, Part A, Examination Category B-A, Item B1.22, Pressure Retaining Welds in Reactor Vessel

2.1.1 The licensee stated that approximately 85% volumetric coverage could be obtained on reactor pressure vessel (RPV) Upper Closure Head Meridional Welds RVHM-2, -4, and -6 and has provided a general schematic of the RPV upper head depicting in-core instrumentation nozzles and control rod drive mechanisms. The ASME Code states that essentially 100% of the "accessible length" of the subject welds must be examined. The

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licensee defined the accessible length of the RPV upper closure head meridional welds as approximately 25-inches of the total 57-inches in length.

The accessible 25-inches for each weld is outside the area of control rod drive penetrations and RPV head shroud. However, the licensee's description of the interferences that caused the limited volumetric examinations is not sufficient to demonstrate impracticality, or the descriptions are unclear. The licensee states:

<100% coverage was achieved when scanned parallel to the weld due to the flange at the bottom of the weld and a taper 25" up on the weld.

The licensee included a rough sketch showing how the blend radius of the flange might impact the parallel scans, however, the "taper 25-inches up on the weld" is not depicted. Please clarify the sketch, or submit a written text, to further describe how both of these geometrical conditions caused the limited volumetric coverage on the subject welds.

2.1.2 The licensee's overall coverage of meridional Welds RVHM-2, -4, and -6 is stated to be 85%, however, other statements of coverage for portions of the weld volumes are provided:

- a) *<1% of the lower 15% of the weld was scanned in all four directions.*
- b) *Using one sided qualified personnel, 100% of the upper 85% was covered in one direction perpendicular and one direction parallel.*

It is unclear why the ASME Code-required orthogonal scans were not performed on the upper 85% of the weld volumes, if it was possible to do so. Please explain this discrepancy.

In addition, it is unclear what is meant by <1% in four directions for the inner 15% weld volume. Since it is expected that degradation, should it occur, may be manifested first in the inner and outer volumes of the welds, it is important to achieve maximum examination coverage for these areas. Please list the extent of volumetric coverage for each of the four scan directions, and adequately describe the cause(s) of limited examinations for each of these scanning directions. Discuss whether alternative angles and/or techniques, such as phased array, were considered to maximize coverage of the inner 15% of the weld volumes.

2.1.3 For RPV Closure Head-To-Flange Weld RVHC-2, the licensee submitted sketches depicting the closure head geometry and appurtenances (such as the lifting lugs) that may impact ultrasonic scanning. However, sufficient discussion of scanning limitations has not been included. For each of the techniques applied, describe specifically how the geometric conditions and lifting lugs impacted the volumetric coverage.

2.1.4 The licensee also states the following concerning Weld RVHC-2:

Entergy performed the volumetric examination to the extent practical; resulting in approximately fifty percent (50%) of the weld volume [being] ultrasonically examined for 2/3 of the weld length in 1997. Eighty four percent (84%) coverage was obtained using updated equipment and better technique in the last 1/3 of the weld length in 2004.

It is noted that the licensee was able to dramatically increase coverage through the use of updated equipment, better procedures and ultrasonic techniques during the third interval. Since only limited volumetric sampling is required by ASME Code, it is expected that licensee's will maximize examination coverage throughout the interval using new technology as it becomes available. This expectation is the primary basis for allowing licensee's to wait up to 12 months after the interval is completed to submit requests for relief [10 CFR 50.55a(g)(5(iv))].

The licensee applied better techniques and equipment to only 1/3 of the RPV head-to-flange weld, when in fact, the remaining 2/3 could have been re-inspected with these new techniques and equipment to maximize the coverage for the interval during the same outage without significantly impacting schedule or personnel exposure. Discuss why the new techniques and equipment were not used on the remaining 2/3 of Weld RVHC-2.

2.2 Request for Relief RR-CRV-75, Part B, Examination Category B-D, Item B3.110, Full Penetration Welded Nozzles in Vessels

2.2.1 The licensee has requested relief from the inside radius examinations on pressurizer spray and surge nozzles. These nozzles are integrally cast into the upper and lower heads, respectively. The licensee previously requested relief for these inner radii examinations, and it was concluded that a visual examination would be performed on the inside of the pressurizer in these areas. A thermal shield and an array of nozzle heads preclude meaningful visual examination on the spray nozzle; similarly, the inner radius of the surge nozzle is covered by a retaining basket.

The licensee cites discussions with two inspection vendors to establish a basis for why the ASME Code volumetric examinations cannot be performed from the outside surface of the nozzles:

Further, discussions that were had with two ISI examination vendors that serviced Indian Point 2 during the third interval confirmed our earlier opinion that the nozzle configuration of both the PRZN-1 [spray] and PRZN-6 [surge] nozzles precluded examination of those locations [inner radius areas], even with the most advanced ultrasonic systems currently in use. No coverage was obtained.

However, the NRC staff has noted that other licensees have completed similar examinations through the use of modeling (performed by Electric Power Research Institute) and novel transducer designs, including recent phased array technology.

No objective evidence has been provided by the licensee to demonstrate a basis for impracticality. Submit drawings and descriptions to document the assessments IP2 has completed to demonstrate that no volumetric examinations could be performed from the outside surface of the nozzle/head.

2.3 Request for Relief RR-CRV-75, Part C, Examination Category R-A, Item R1.20, Risk-Informed Piping Examinations

- 2.3.1 The licensee has requested relief from 100% examinations on four safe end-to-piping welds adjacent to dissimilar metal welds on the RPV inlet/outlet nozzles. The licensee listed these welds in the following manner:

*RCC 21-1 RCS Pipe-to-Safe End Circ Weld RO @ 202°
RCC 22-1 RCS Pipe-to-Safe End Circ Weld RO @ 158°
RCC 23-1 RCS Pipe-to-Safe End Circ Weld RO @ 338°
RCC 24-1 RCS Pipe-to-Safe End Circ Weld RO @ 022°*

However, in the text of Attachment 4 (Page 25 of 71) of the licensee's submittal dated March 26, 2008, states the following:

The safe-end-to-nozzle welds (RCC-21 -1, RCC-22-1, RCC-23-1, & RCC-24-1) had limitations due to the tapered area of the weld overlay on the ID [inside diameter].

It is unclear whether the safe end-to-nozzle welds or the safe end-to-piping welds are intended to be included in RR-CRV-75. A drawing provided by the licensee appears to indicate that the welds listed above are the pipe-to-safe end similar metal welds. Please confirm that relief is intended for limited examinations on the pipe-to-safe end welds, and if so, provide new text and/or drawings/sketches, as needed, to support the request.

In addition, please discuss the ID welded overlay (The ASME Code currently describes this as an on-lay), including materials deposited, thickness and extent, and when this on-lay was applied.