Entergy

Entergy Nuclear Northeast
Entergy Nuclear Operations, Inc
Indian Point Energy Center
295 Broadway, Suite 1
PO Box 249
Buchanan, NY 10511-0249

August 14, 2002

Re: Indian Point Unit No. 2
Docket No. 50-247
NL-02-107

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station O-P1-17
Washington, DC 20555-0001

Subject: ASME Section XI, Inservice Inspection (ISI) Program Relief Request No. 60

Dear Sir:

Pursuant to 10 CFR 50.55a(a)(3), Entergy Nuclear Operations, Inc. (ENO) hereby requests relief from certain requirements of the 1989 Edition of the American Society of Mechanical Engineers (ASME) Section XI Code. In accordance with the Code, welds on the regenerative heat exchanger require volumetric examinations. These examinations have been determined to be a hardship without a compensating increase in safety based upon 1) the excessive personnel dose required to perform these examinations, and 2) the geometry of the welds which preclude full coverage. Attachment 1 contains the basis for this relief request.

Because the subject examinations of the regenerative heat exchanger welds are planned for the upcoming IP-2 refueling outage, currently scheduled to begin on October 26, 2002, ENO hereby requests an expedited review by the NRC staff.

No new commitments are being made in this letter.

Should you or your staff have any questions regarding this matter, please contact Mr. John McCann, Licensing Manager, at (914) 734-5074.

Very truly yours,

Mr. Fred Dacimo
Vice President – Operations
Indian Point 2

Attachment

A047

C: Mr. Hubert J. Miller
Regional Administrator-Region I
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Mr. Patrick D. Milano, Senior Project Manager
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ATTACHMENT 1 TO NL-02-107

Relief Request No. 60

Entergy Nuclear Operations, Inc.
Indian Point Unit No. 2
Docket No. 50-247

RELIEF REQUEST NUMBER 60

COMPONENT IDENTIFICATION

Code Class:	1
References:	IWB-2500, Table IWB-2500-1
Examination Category:	B-B, B-D
Item Number:	B2.51, B2.80, B3.150, B3.160
Description:	Inspection of Regenerative Heat Exchanger Circumferential Welds, Tubesheet-to-Shell Welds, Nozzle-to-Vessel Welds, and Nozzle Inside Radius Sections.
Component:	21 Regenerative Heat Exchanger

Welds	Description	Code Item #	Class
RGX C-1-1	Circumferential Head Weld	B2.51	1
RGX C-1-4	Circumferential Head Weld	B2.51	1
RGX C-1-2	Tubesheet to Shell Weld	B2.80	1
RGX C-1-3	Tubesheet to Shell Weld	B2.80	1
RGX N-1-1	Nozzle to Vessel Weld	B3.150	1
RGX N-1-2	Nozzle to Vessel Weld	B3.150	1
RGX N-1-3	Nozzle to Vessel Weld	B3.150	1
RGX N-1-4	Nozzle to Vessel Weld	B3.150	1
RGX N-1-1	Nozzle Inside Radius	B3.160	1
RGX N-1-2	Nozzle Inside Radius	B3.160	1
RGX N-1-3	Nozzle Inside Radius	B3.160	1
RGX N-1-4	Nozzle Inside Radius	B3.160	1
RGX C-2-1	Circumferential Head	B2.51	1
RGX C-2-4	Circumferential Head	B2.51	1
RGX C-2-2	Tubesheet to Shell Weld	B2.80	1
RGX C-2-3	Tubesheet to Shell Weld	B2.80	1
RGX N-2-1	Nozzle to Vessel Weld	B3.150	1
RGX N-2-2	Nozzle to Vessel Weld	B3.150	1
RGX N-2-3	Nozzle to Vessel Weld	B3.150	1
RGX N-2-4	Nozzle to Vessel Weld	B3.150	1
RGX N-2-1	Nozzle Inside Radius	B3.160	1
RGX N-2-2	Nozzle Inside Radius	B3.160	1
RGX N-2-3	Nozzle Inside Radius	B3.160	1
RGX N-2-4	Nozzle Inside Radius	B3.160	1
RGX C-3-1	Circumferential Head Weld	B2.51	1
RGX C-3-4	Circumferential Head Weld	B2.51	1
RGX C-3-2	Tubesheet to Shell Weld	B2.80	1
RGX C-3-3	Tubesheet to Shell Weld	B2.80	1
RGX N-3-1	Nozzle to Vessel Weld	B3.150	1
RGX N-3-2	Nozzle to Vessel Weld	B3.150	1
RGX N-3-3	Nozzle to Vessel Weld	B3.150	1
RGX N-3-4	Nozzle to Vessel Weld	B3.150	1
RGX N-3-1	Nozzle Inside Radius	B3.160	1
RGX N-3-2	Nozzle Inside Radius	B3.160	1

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RGX N-3-3	Nozzle Inside Radius	B3.160	1
RGX N-3-4	Nozzle Inside Radius	B3.160	1

CODE REQUIREMENT

1989 ASME Boiler and Pressure Vessel Code Section XI, Table IWB-2500-1, Category B-B, requires a volumetric examination be performed on the Regenerative Heat Exchanger circumferential head welds and tubesheet-to-shell welds. Category B-D requires volumetric examination of the nozzle inside radius sections, and the nozzle-to-vessel welds.

In addition to the above-mentioned Code requirements, a surface examination (liquid penetrant) of the affected welds (i.e., Code item # B3.150) is performed as a compensatory measure for weld geometric physical constraints. These constraints preclude coverage of at least 90 percent of the inspection volume as required by the Code requirements. This additional surface examination was a proposed examination alternative contained in previously approved Relief Request Number 8.

BASIS FOR RELIEF

Background

The regenerative heat exchanger provides preheat for the normal charging water flowing into the reactor coolant system (RCS). Preheat is derived from normal letdown water coming from the RCS. The heat exchanger is actually three heat exchangers or sub-vessels of similar design and function. Each heat exchanger has an outside shell diameter of 9.25 inches. The shells were manufactured with austenitic stainless steel material. The nozzles are 3-inch schedule 160 of similar material. Per Table IWB-2500-1, Category B-B, Note 1, examinations of circumferential head welds and tubesheet to shell welds, may be limited to one vessel among a group of vessels performing a similar function. Conversely, all Section XI Class 1 nozzle welds are required to be examined and may not be limited to one vessel.

The purpose of this relief request is to eliminate Category B-B and B-D weld examinations on the regenerative heat exchanger.

Dose Considerations

A dose evaluation has been conducted on each activity associated with the examinations of the regenerative heat exchanger. Table 1 gives the personnel dose expected from these activities. A personnel dose of 9.655 man-rem is estimated to complete the required examinations over the interval. This estimate assumes optimum inspection and preparation times and should be considered conservatively low. If difficulties are encountered a corresponding increase in dose would be expected.

Geometric Restrictions

The regenerative heat exchanger was designed and fabricated to the 1965 Edition of the ASME Section III Code. As indicated in this edition of the Code, the regenerative heat exchanger is Class C. The Code did not require that there be full access for inservice inspection, as was

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required by later Code editions. Thus the heat exchanger was designed before inspection, ample access and weld configuration conducive for examination were required. Estimates of actual coverage (50 to 75 percent available) were previously described in Relief Request Number 8, and approved by the NRC.

The small diameter of the vessel and nozzles prevent a meaningful ultrasonic examination of these components. The joint design of the nozzle weld specifies a 3-inch schedule 160 weldolet joined to a 9.25 inch O.D. x 0.875-inch thick vessel. The configuration of the weldolet precludes axial ultrasonic examination from the nozzle side and circumferential examination in either direction. This limits volumetric examination to single axial scan from the vessel side of the nozzle. Because of these restrictions a meaningful ultrasonic examination cannot be performed on weld or inner radius with a single axial scan, due to the small diameter of the vessel and weldolet. In addition, the change in the surface contour around the joint results in a corresponding change in the ultrasonic beam angle, which makes position measurements unreliable. It would be necessary to extend the beam path to at least two full Vee paths, which would further complicate this examination since there is insufficient distance for this extension. These limitations significantly diminish the ability to accurately detect and characterize flaws. The configuration also precludes performing meaningful radiography of the affected joints due to the surface contour of the joints.

Inspection History

Since the 1995 refueling outage, which encompassed the end of the second interval and the beginning of the third interval, twenty-four (24) of the above listed welds have been volumetric and/or surface examined. No unacceptable flaws were identified during those inspections, supporting the conclusion that eliminating the subject inspections will not have a significant impact on the continued structural integrity of the regenerative heat exchangers. This is attributed to the fact that the heat exchangers are properly designed for their intended service conditions and that no active degradation mechanisms are expected to be present. Even if some minor degradation were present, the difficulties of performing an effective volumetric inspection significantly reduces the potential value of those inspections.

Conclusion

If the Code required examinations are performed, geometric restrictions would severely limit the amount of meaningful information concerning the condition of the heat exchanger. Therefore, the exposure to significant radiation dose would result in a hardship without a compensating increase in the level of quality and safety. Considering the alternative requirements discussed herein, relief from these Code required examinations on the regenerative heat exchanger is requested per the provisions of 10 CFR 50.55a(a)(3)(ii).

Furthermore, similar relief requests for the elimination of the Code required examinations for regenerative heat exchangers were previously submitted for the Surry Power Station Units 1 and 2, and North Anna Power Station Unit 2 and Farley. Both the Surry and North Anna Unit 2 relief requests were approved by the NRC in letters dated May 24, 2002 (TAC NOS. MB1998 and MB1999) and March 26, 2001 (TAC NO. MB0750), respectively.

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It should be noted that specific design differences (i.e., redundant fail-closed isolation valves on the letdown side of the heat exchanger) exist between IP-2, Surry, and North Anna Unit 2. IP-2 was constructed and licensed to design requirements and standards, which at the time did not require double isolation valves between the reactor coolant system and the regenerative heat exchangers. Notwithstanding these differences, the fabrication of the regenerative heat exchanger is similar, and the radiation dose exposure considerations associated with performing these examinations remain the same.

PROPOSED ALTERNATIVE PROVISIONS

Technical Specifications require that the RCS leak rate be limited to 1 gallon per minute unidentified leakage. This value is calculated in accordance with Technical Specification requirements. Additionally, the containment atmosphere particulate radioactivity is monitored per Technical Specification requirements. As a result, new leakage is rapidly identified and located during operation. Upstream valves that may be operated from the control room could isolate leaks identified on the heat exchanger. Check valves are installed on the charging and auxiliary spray lines downstream of the heat exchanger. The letdown isolation valve also receives an automatic control signal to close on inventory loss based on pressurizer level.

The heat exchanger will continue to receive a system leakage test prior to startup after each refueling outage. During this system test, the components receive a visual (VT-2) examination. The corresponding piping and component supports will also continue to be inspected per the requirements of the Code, as they are not affected by this relief request.

Approval of this relief request will supercede previously approved Relief Request Number 8 in its entirety as it will no longer be necessary to satisfy the subject Code requirements.

PERIOD FOR WHICH RELIEF IS REQUESTED

Relief is requested for the third inspection interval, July 1, 1994 through June 30, 2004. Furthermore, this interval has been extended to April 3, 2006 as discussed in Con Edison's Letter to the NRC dated February 1, 2001.

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FIGURE 1

21 Regenerative Heat Exchanger

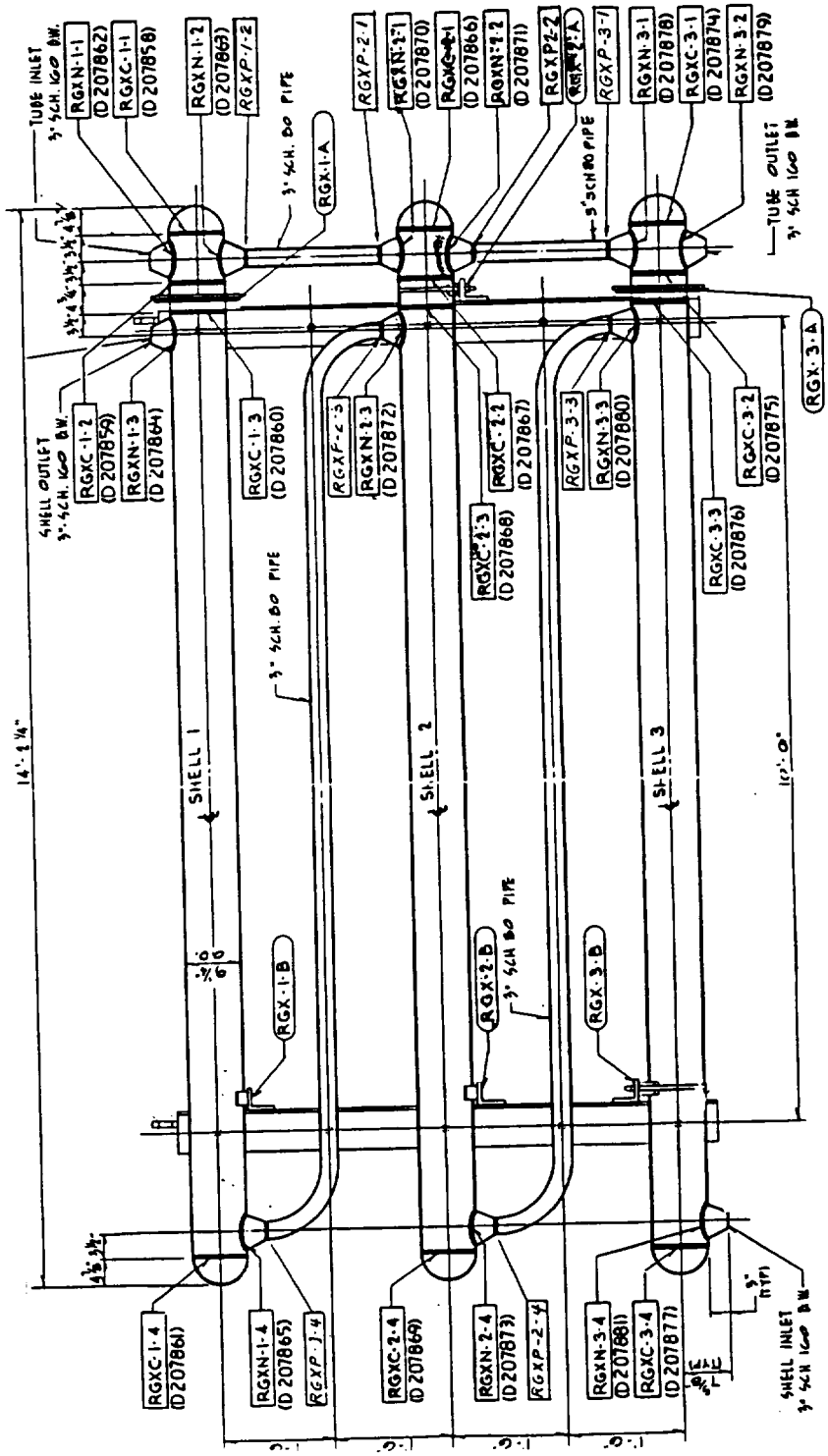

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TABLE 1
Man-Rem Estimate for Regenerative Heat Exchanger

Work Task	Job Site Man-Hours	Dose Rates Rem/Hr	Est. Man-Rem/Interval
Insulation removal/installation	1.5	0.7	1.05
Install/remove shielding	0.5	0.4	0.2
Weld prep	0.75	0.7	0.53
HP coverage	0.5	0.4	0.2
PT on Nozzle-to-vessel welds (#) N-1-1, N-1-2, N-1-3, N-1-4, N-2-1, N-2-2, N-2-3, N-2-4, N-3-1, N-3-2, N-3-3, N-3-4	2.0	0.7	1.4
UT on Nozzle-to-vessel welds N-1-1*, N-1-2*, N-1-3*, N-1-4*, N-2-1*, N-2-2*, N-2-3*, N-2-4*, N-3-1*, N-3-2*, N-3-3*, N-3-4*	3.0	0.7	2.1
UT on Nozzle-to-inside radius N-1-1*, N-1-2*, N-1-3*, N-1-4*, N-2-1*, N-2-2*, N-2-3*, N-2-4*, N-3-1*, N-3-2*, N-3-3*, N-3-4*	4.0	0.7	2.8
UT on Circumferential head welds C-1-1, C-1-4, C-2-1*, C-2-4*, C-3-1, C-3-4	1.0	0.55	0.55
UT on Tubesheet-to-shell welds C-1-2, C-1-3, C-2-2*, C-2-3*, C-3-2, C-3-3	1.5	0.55	0.825
Total Man-Rem for Interval			9.655

* Required weld
\# Previous commitment per Relief Request Number 8