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December 19, 2002  
IPN-02-095

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

SUBJECT: Indian Point 3 Nuclear Power Plant  
Docket No. 50-286  
**Reactor Pressure Vessel Head and Penetration Nozzles**  
**Inspection Plan for Spring 2003 Refueling Outage**

- References:
1. NRC Bulletin 2001-01; "Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles," dated August 3, 2001.
  2. NRC Bulletin 2002-01; "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity," dated March 18, 2002.
  3. NRC Bulletin 2002-02; "Reactor Pressure Vessel Head and Vessel Head Penetration Nozzle Inspection Programs," dated August 9, 2002.

Dear Sir:

This purpose of this letter is to provide additional information regarding the planned inspection of the Indian Point 3 (IP3) reactor pressure vessel (RPV) head and vessel head penetration (VHP) nozzles during the upcoming refueling outage, scheduled to begin March 28, 2003. Entergy Nuclear Operations, Inc (ENO) previously provided information requested by the NRC (References 1, 2, and 3) including initial plans for inspection during the next refueling outage. ENO also stated in responses to these Bulletins that details regarding the inspection plan would be provided 90 days prior to outage.

ENO has recently completed the inspection of the IP2 RPV head and VHP nozzles and plans to apply similar scope and methods for the inspection of the IP3 RPV head. The inspection will consist of bare metal visual examination from above the head, supplemented by ultrasonic and eddy current examinations of VHP nozzles from under the head. Additional details are provided in Attachment I.

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No new commitments are being made in this letter. If you have any questions, please contact Mr. John McCann (914) 734-5074, Licensing Manager.

I declare under penalty of perjury that the foregoing is true and correct. Executed on 12/19/02

Very truly yours,



Mr. Robert J. Barrett  
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cc:

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ATTACHMENT I TO IPN-02-095

REACTOR VESSEL HEAD INSPECTION PLAN  
FOR INDIAN POINT 3, SPRING 2003 REFUELING OUTAGE

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

### NRC Required Information

- NRC Bulletin 2001-01, Item 4a:

*your plans for future inspections (type, scope, qualification requirements, and acceptance criteria) and the schedule.*

The ENO response to this item was provided in IPN-01-079 / NL-01-133, dated November 13, 2001. That letter included a commitment to provide additional details regarding the planned inspection 90 days prior to the start of the outage. The additional information is provided in the following sections.

- NRC Bulletin 2002-01, Item 1 D:

*your schedule, plans, and basis for future inspections of the reactor pressure vessel head and penetration nozzles. This should include the inspection method(s), scope, frequency, qualification requirements, and acceptance criteria.*

The ENO response to this item was provided in IPN-02-023 / NL-02-050, dated April 2, 2002. That letter confirmed the existing commitment to provide further inspection plan details 90 days prior to the start of the outage. The additional information is provided in the following sections.

- NRC Bulletin 2002-02, Item 1 A:

*PWR addressees who plan to supplement their inspection programs with non-visual NDE methods are requested to provide a summary discussion of the supplemental inspections to be implemented. The summary discussion should include EDY, methods, scope, coverage, frequencies, qualification requirements, and acceptance criteria.*

The ENO response (IPN-02-069, dated August 26, 2002) to Bulletin 2002-02 confirmed the existing commitment to provide further inspection plan details 90 days prior to the start of the outage. The additional information is provided in the following sections.

## ENO Response

The following information regarding the planned inspection of the Indian Point 3 reactor pressure vessel (RPV) head and vessel head penetration (VHP) nozzles during the next refueling outage (3R12) is provided as stated in previous responses (References 1, 2, and 3) to NRC Bulletins 2001-01, 2002-01 and 2002-02. ENO previously committed to performing this inspection and stated that details would be provided 90 days prior to the refueling outage. ENO has been monitoring industry experience in this area and has recently completed an inspection of the Indian Point 2 RPV head and VHP nozzles. ENO plans to perform a bare metal visual examination from above the head, supplemented by ultrasonic and eddy current examinations of VHP nozzles from under the head. The additional information previously provided in Attachment II to Reference 4 for IP2 is also applicable to IP3.

### A. EDY

ENO has evaluated the EDY and EFPY for IP3 as requested in Bulletin 2002-02. Based on continued operation at full power until the next refueling outage, scheduled to begin on March 28, 2003, EDY is estimated to be 11.2 years. This value takes credit for upper head flow distribution and includes implementation of the recently approved 1.4% power uprate in December 2002. The estimated EFPY based on a March 28, 2003 outage date is 15.6 years.

### B. METHOD

1. ENO will remove the IP-3 vessel head insulation ("Kaylo Block" covered with asbestos tape and asbestos cement) inside the CRDM cooling shroud. The "Kaylo Block" rests directly on and follows the contour of the vessel head surface. Since the present insulation configuration prevents IP3 from performing an effective BMV, the present insulation will be removed prior to performing the inspection and replaced with reflective insulation. The reflective insulation will be offset from the head surface to allow future remote visual inspections.
2. The visual examination will be performed utilizing remote video camera technology capable of detecting boron deposits on the surface of the vessel head. The remote BMV examination will include the entire top surface of the vessel head, and 360 degrees around each of the individual penetrations in the vessel head, consistent with guidance provided in References 5 and 6. The surface of the vessel head is painted with a heat resistant silicone aluminum coating. ENO does not intend to remove this paint in order to conduct the BMV examination.
3. ENO intends to supplement the 100% BMV examination with nondestructive examination (NDE) from under the vessel head by using Westinghouse "demonstrated" technology, and their procedures with the oversight of Entergy Engineering and Quality Control inspectors. A demonstration of WesDyne (a division of the Westinghouse Corporation) inspection equipment and procedures was conducted at their Windsor, CT facility during the period of August 26 to September 11, 2002. Open-tube and blade-probe ultrasonic (UT) and eddy current (ET) equipment and procedures were demonstrated. WesDyne procedures addressed inspection of the VHP tube and weld-to-tube interface from the inside surface of the tube. The demonstration was conducted on

the Entergy/MRP mock-up samples, as part of the readiness review process established by the MRP demonstration protocol (i.e., a blind demonstration testing for the relevant procedures and essential variables) (Reference 7).

4. In addition, even though not specifically part of the demonstration, the transducer used in the demonstration is capable of viewing the triple point of the nozzle where the J-groove weld, the nozzle and the weld butter intersect
5. Penetrations found to contain evidence of boric acid deposits consistent with a primary coolant leak resulting from a through wall defect in the Inconel 600 base material or in the J-groove weld, will be additionally examined with a volumetric inspection technique capable of detecting the source and extent of the leak path.
6. Penetrations found to contain unacceptable indications during the volumetric examinations will receive an additional surface examination of the J-groove weld using either liquid penetrant testing (PT), or ET inspection techniques.

#### C. SCOPE

1. The remote BMV examination will include the entire top surface of the vessel head and 360-degrees around each of the individual penetrations in the vessel head.
2. The NDE inspection plan for all 78 VHP nozzles includes the use of Westinghouse demonstrated NDE inspection equipment, techniques, and procedures to cover the volume of the VHP tube and the weld-to-tube interface from the inside surface of the tube, and to span the length of the J-groove weld and the upper and lower heat affected zones of the weld.

#### D. COVERAGE

1. The IP3 design has 78 VHP nozzles.
2. The BMV examination will include the entire top surface of the vessel head, and essentially 100% of the CRDM to Reactor Pressure Vessel head junctions.
3. The NDE inspection plan is to examine the 78 VHP nozzles with the Westinghouse/WesDyne "demonstrated" inspection equipment, techniques, and procedures.
4. ENO intends to complete NDE examination of all 78 VHP nozzles in 3R12, to the extent practical, contingent upon factors such as NDE equipment reliability, personnel exposure considerations, outage duration and available outage resources. The coverage completed will be reported by ENO in the inspection results summary due to be submitted within 30 days after plant restart. ENO is procuring and configuring the inspection equipment so that 100% coverage is expected.
5. ENO plans to implement lessons learned from the BMV and NDE examinations performed at IP2 (2R15) in November, 2002, and other industry inspections to date.

#### E. FREQUENCY

ENO is continuing to monitor industry experience regarding this issue and has not yet finalized specific plans regarding the appropriate frequency for inspections. That decision is also dependent on the results and actual completed coverage of the 3R12 inspection.

#### F. QUALIFICATION REQUIREMENTS

The BMV examinations will be performed by VT-2 qualified personnel as required by ASME Section XI. In addition, ENO contracted with Westinghouse to develop the inspection techniques and the associated tooling to complete the supplemental NDE inspections. Personnel, equipment and inspection techniques to be used during the volumetric inspections have been demonstrated in the ENO / EPRI / MRP practice mock-up, as part of the readiness review process established by the MRP demonstration protocol developed for this purpose (Reference 7).

#### G. ACCEPTANCE CRITERIA

NDE results will be evaluated in accordance with the rules provided in Subsection IWB-3600 of the ASME Section XI Code. Flaws that exceed the requirements of IWB-3600 will be repaired in accordance with the requirements of ASME Section XI, and approved relief requests, prior to returning the plant to service.

#### H. REFERENCES

1. ENO letter to NRC, IPN-01-079 / NL-01-133, Revised Vessel Head Penetration Inspection Plans regarding BL 2001-01; dated November 13, 2001.
2. ENO letter to NRC, IPN-02-023 / NL-02-050, Submittal of 15-Day Response to NRC Bulletin 2002-01; dated April 2, 2002.
3. ENO letter to NRC, IPN-02-069, 15-Day Response [for IP3] to NRC Bulletin 2002-02; dated August 26, 2002.
4. ENO letter to NRC, NL-02-119, 30-Day Response [for IP2] to NRC Bulletin 2002-02; dated September 11, 2002.
5. EPRI Report 1006296, Rev. 1; "Visual Examination for Leakage of PWR Reactor Head Penetrations", January 2002.
6. EPRI Report 1007337, Rev. 1; PWR Reactor Pressure Vessel (RPV) Upper Head Penetrations Inspection Plan, September 2002.
7. MRP Interim Status Report on PVHP Inspection Performance Demonstration Activities; November 1, 2002.