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Indian Point Energy Center
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Fred Dacimo
Site Vice President
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January 17, 2005

Re: Indian Point Units 2
Docket No. 50-247
NL-05-001

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

Subject: **Reactor Vessel Upper Head Inspection Results;**
Indian Point 2, Fall 2004 Refueling Outage (2R16)

Reference:

1) NRC Order EA-03-009, "Issuance of First Revised NRC Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors", dated February 20, 2004

2) Entergy letter to NRC dated March 11, 2004 (NL-04-026); "Answer To February 20, 2004 Revised NRC Order Regarding Interim Inspection Requirements for Reactor Pressure Vessel Heads"

3) NRC letter to Entergy, "Relaxation of First Revised Order on Reactor Vessel Nozzles, Indian Point Nuclear Generating Unit No. 2 (TAC No. MC3194)", dated October 15, 2004

Dear Sir:

This letter provides the Reactor Vessel Upper Head Inspection Report (Attachment 1) for Indian Point 2 (IP2), in accordance with Section IV.E of NRC First Revised Order, EA-03-009 (Reference 1). The inspection was performed during refueling outage 2R16 that was completed on November 22, 2004.

The inspection consisted of the bare metal visual examination of no less than 95 percent of the Reactor Pressure Vessel (RPV) head surface and 360 degrees around each RPV head penetration nozzle, consistent with the requirements of Section IV.C.(5)(a) of the Order, based on the Moderate Category as defined in section IV.B of the Order. Entergy Nuclear Operations, Inc (ENO) consent to the Order (Reference 2) indicated that IP2 would perform the next (2R16)

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scheduled inspection in accordance with the requirements of the Order and approved relaxations. A subsequent relaxation request was authorized by the NRC to implement an alternative to the requirements of Section IV.C.(5)(a) (Reference 3).

Based on the results of this inspection, ENO concludes that there are no indications of reactor pressure vessel upper head degradation, or primary reactor coolant boundary leakage at the control rod drive mechanism penetrations.

No new commitments are being made in this letter. If you have any questions, please contact Mr. Patric W. Conroy, Manager, Licensing at (914) 734-6668.

Very truly yours,

Fred R. Dacimo
Site Vice President
Indian Point Energy Center

Attachment 1 (Reactor Vessel Upper Head Inspection Results; Indian Point 2, Fall 2004 Refueling Outage (2R16))

cc: see next page

cc: Mr. Patrick D. Milano, Senior Project Manager
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ATTACHMENT 1 TO NL-05-001

REACTOR VESSEL UPPER HEAD INSPECTION RESULTS;

INDIAN POINT 2, FALL 2004 REFUELING OUTAGE (2R16)

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 2
DOCKET NO. 50-247

Introduction

Entergy Nuclear Operations, Inc (ENO) performed an inspection of the Indian Point 2 (IP2) reactor pressure vessel (RPV) head and vessel head penetration (VHP) nozzles in November 2004. The inspection complied with NRC Revised Order EA-03-009 (Reference 1), as committed in Reference 2, and with NRC authorized inspection alternative to Section IV.C.(5)(a) (Reference 3).

The results of the prior inspection, performed in November, 2002 during 2R15 were reported in Reference 4. Based on the EDY (effective degradation years) methodology and criteria stated in Sections IV.A and IV.B of the Order, ENO determined that the IP2 head was in the moderate susceptibility category for the inspection conducted in 2R16. Section IV.C.(2) of the Order specifies an inspection based on either bare metal visual (BMV) examination of the RPV head surface or non-visual NDE examination techniques applied to the vessel head penetration nozzles. The inspection performed at IP2 consisted of bare metal visual examination of no less than 95% of the RPV head surface and 360 degrees around each RPV head penetration nozzle, consistent with the alternative examination option specified in Section IV.C.(5)(a) and further authorized by the NRC (Reference 3).

Based on this inspection, ENO concludes that there are no signs of reactor pressure vessel head degradation. Additional details regarding the inspection are provided in the following sections.

Bare Metal Visual (BMV) Examinations

The BMV examination included no less than 95 percent of the entire RPV head surface (including 360° around each RPV head penetration nozzle), consistent with MRP and EPRI guidance provided in References 5 and 6. The BMV examination also included those areas of the RPV head upslope and downslope from the reflective metal insulation (RMI) support ring to identify any evidence of boron or corrosive product. Various types of inspection equipment were used to achieve this requirement (i.e., video probes, remote operated vehicle, and direct examination) depending on the accessibility of each location.

Remnants of insulation debris from the removal effort in 2R15 were identified on the RPV head mostly around the outer perimeter nozzles. The debris was removed to the extent possible and a post-cleaning examination was performed with no evidence of any active leakage from any of the penetrations or evidence of bare metal degradation.

Boron residue was identified on top of the RPV head adjacent to several penetrations and at one location outside the RMI support ring. This was determined to be from leaks associated with Conoseal and Canopy Seals above the insulation system that occurred during the cycle in addition to residual boron from a previous Canopy Seal leak (penetration #86) that was repaired at the end of 2R15. Loose deposits of boric acid on the RPV surface from these leaks were cleaned as part of the examination process including from under the RMI support ring, with no evidence of any active leakage from any penetrations or evidence of bare metal degradation. The new Conoseal and Canopy Seal leaks were identified and repaired in 2R16. The Conoseal leak at #91 was repaired by cleaning the flanged surface and replacing the gasket, and the

Canopy Seal leaks on Canopy Seal welds #2 and #17 were repaired by installation of Canopy Seal clamps. The top of the insulation was vacuumed to remove loose boron deposits.

Personnel Qualification

The inspection results were reviewed by certified Level II or Level III VT-2 personnel, meeting the requirements of ASME Section XI. The examiners also received familiarization pre-job training using photographs of industry examination results from References 5 and 6, and from inspection tapes of the IP2 BMV examination in Fall, 2002.

Corrective Actions and Root Cause Determination

Based on the results of the BMV examinations there were no indications of degradation of the VHPs or wastage of the vessel head base metal surface. Therefore, no corrective actions or root cause determinations were deemed necessary.

Upon completion of the BMV examinations, debris on the reactor vessel head, and boric acid deposits from the previously described leaks were removed. The source of these mechanical joint and seal weld leaks were repaired in 2R16 and verified leak tight during inservice pressure inspection.

In 2R17, IP2 is expected to remain in the moderate susceptibility category and as such, expects to perform a vessel head inspection in accordance with the requirements of Section IV.C.(5)(b) of the Order and the relaxation request described in Reference 3.

References

1. NRC Order EA-03-009, "Issuance of First Revised NRC Order (EA-03- 009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors", dated February 20, 2004

2. Entergy letter to NRC dated March 11, 2004 (NL-04-026); "Answer to February 20, 2004 Revised NRC Order Regarding Interim Inspection Requirements for Reactor Pressure Vessel Heads"

3. NRC letter to Entergy, "Relaxation of First Revised Order on Reactor Vessel Nozzles, Indian Point Nuclear Generating Unit No. 2 (TAC No. MC3194)", dated October 15, 2004

4. Entergy letter to NRC dated December 18, 2002 (NL-02-162) "Reactor Vessel Head Inspection Results; Indian Point 2, Fall 2002 Refueling Outage"

5. MRP-75, PWR Reactor Pressure Vessel Upper Head Penetrations Inspection Plan, Revision 1 (EPRI 1007337)

6. EPRI Report 1006296, Rev. 2; "Visual Examination for Leakage of PWR Reactor Head Penetrations", March 2003