



Entergy Nuclear Northeast
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Fred Dacimo
Site Vice President
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July 12, 2006

Re: Indian Point Unit 2
Docket No. 50-247
NL-06-064

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, Spring 2006 Refueling Outage (2R17)**

- 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) NRC letter to Entergy, "Relaxation of First Revised Order on Reactor Vessel Nozzles, Indian Point Nuclear Generating Unit No. 2 (TAC No. MC9230)", dated February 27, 2006

Dear Sir:

This letter provides the Reactor Vessel Upper Head Inspection Results (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 2R17 which was completed on May 19, 2006.

The inspection performed at IP2 during 2R17, consisted of completing non-destructive examination (NDE) on all ninety-seven control rod drive mechanism (CRDM) vessel head penetration (VHP) nozzles and was consistent with the requirements in Section IV.C.5(b)(i) of the Revised Order (Reference 1) and NRC authorized relaxation (Reference 2) for nozzles that were limited by a threaded section that is less than the 1 inch lower boundary limit specified in Section IV.C.5(b) of the Revised Order (Reference 1). In accordance with Section IV.D of the Revised Order (Reference 1), a visual inspection of pressure retaining components above the RPV head was also performed to identify potential boric acid leaks.

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Based on the results of this inspection, Entergy Nuclear Operations, Inc (ENO) concludes that there is no degradation of the reactor pressure vessel upper head penetrations, or primary reactor coolant leakage at the canopy seal welds in the control rod drive mechanisms above the vessel head insulation.

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.

Sincerely,

A handwritten signature in black ink, appearing to read 'Fred R. Dacimo', with a long horizontal flourish extending to the right.

Fred R. Dacimo
Site Vice President
Indian Point Energy Center

Attachment 1 (Reactor Vessel Upper Head Inspection Results; Indian Point 2, Spring 2006
Refueling Outage (2R17))

cc: see next page

cc: **Mr. John P. Boska**
U.S. Nuclear Regulatory Commission

Mr. Samuel J. Collins
U.S. Nuclear Regulatory Commission

Resident Inspector's Office
Indian Point Unit 2 Nuclear Power Plant
U.S. Nuclear Regulatory Commission

Mr. Paul Eddy
New York State Dept. of Public Service

ATTACHMENT 1 TO NL-06-064

**REACTOR VESSEL UPPER HEAD INSPECTION RESULTS;
INDIAN POINT 2, SPRING 2006 REFUELING OUTAGE (2R17)**

**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 Unit 2 (IP2) control rod drive mechanism (CRDM) vessel head penetration (VHP) nozzles in April and May of 2006. The inspection complied with NRC Revised Order EA-03-009 (Reference 1) and NRC authorized relaxation (Reference 2).

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 2R17. Section IV.C.(2) of the Order specifies alternating inspections 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 during 2R17, consisted of completing non-visual NDE on all ninety-seven control rod drive mechanism (CRDM) vessel head penetration (VHP) nozzles and by performing a visual inspection of pressure retaining components above the RPV head.

Based on this inspection, ENO concludes that there is no degradation of the reactor pressure vessel head penetrations, or primary reactor coolant leakage at the canopy seal welds in the control rod drive mechanisms above the vessel head insulation. Additional details regarding the inspections are provided in the following sections.

Non-visual NDE Examinations

ENO performed examinations of all ninety-seven CRDM VHP penetrations by qualified personnel from WesDyne, a division of the Westinghouse Corporation, under the supervision of ENO personnel.

The inside surface of each penetration was inspected with a combination of volumetric (i.e., ultrasonic, UT) and surface (i.e., eddy current, ECT) examination techniques using a "Trinity" probe arrangement. The examination covered sufficient axial length of the tube to span at least 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) and to the lowest position achievable below the root of the J-groove weld on the bottom of the nozzle. During 2R17 inspections, four nozzles (#47, 52, 77, and 80) were found to have UT coverage of less than 1 inch below the lowest point of the root of the J-groove weld. The inspection was limited by a threaded section on the bottom outside portion of the nozzle that prevents acquisition of meaningful UT data. However, ECT surface examination was achieved for the inside surface of the tube in excess of 1 inch below the lowest point of the root of the J-groove weld for all CRDM VHP nozzles. Prior to 2R17, ENO submitted a relaxation request (Reference 3) for nozzles with less than 1 inch volumetric coverage below the J-groove weld. In Reference 2, the NRC authorized ENO's relaxation request. Coverage for these four nozzles exceeded the minimum allowed coverage as authorized by the NRC in Reference 2. Leak Path Assessments were also conducted on all RPV head penetrations inspected. No leak paths were detected on any of the ninety-seven penetrations.

The inspection results were reviewed by certified Level II or Level III personnel, meeting the requirements of ASME Section XI.

Visual Examination above the Vessel Head Insulation

A visual inspection of pressure retaining components above the RPV head was performed consistent with Section IV.D of the NRC Revised Order (Reference 1). This inspection was performed by VT-2 certified personnel. The purpose of this inspection was to verify that no leakage had occurred from the canopy seals and the Conoseals during the previous operating cycle 17 which could have resulted in degradation of the outer surface of the vessel head. The results of the inspection confirmed that there was no leakage from any of these locations during operating cycle 17. A subsequent post-cleaning visual inspection of the outer surface of the vessel head further confirmed the absence of any boron deposits or any degradation of the vessel head material.

Corrective Actions and Root Cause Determination

Based on the results of the NDE and visual 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.

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. NRC letter to Entergy, "Relaxation of First Revised Order on Reactor Vessel Nozzles, Indian Point Nuclear Generating Unit No. 2 (TAC MC9230) dated February 27, 2006.
3. Entergy letter to NRC dated December 14, 2005 (NL-05-136) "NRC First Revised Order EA-03-009; Relaxation Request for Inspection of IP2 Reactor Pressure Vessel Head".