Entergy

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June 19, 2008

Re: Indian Point Unit 2
Docket No. 50-247
NL-08-097

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

Subject: **Reactor Pressure Vessel Upper Head Inspection Results: Indian Point 2, Spring 2008 Refueling Outage (2R18)**

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

Dear Sir or Madam:

This letter provides the Reactor Pressure Vessel (RPV) Upper Head Inspection Results (Attachment 1) for Indian Point Unit No. 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 2R18, which was completed on April 19, 2008, and consisted of a bare metal visual examination of the RPV head surface and around each RPV head penetration nozzle in accordance with Section IV.C of the Revised Order, and a visual inspection of pressure retaining components above the RPV head in accordance with Section IV.D of the Revised Order (Reference 1).

Based on the results of this inspection, Entergy Nuclear Operations, Inc (ENO) concludes that there is no degradation of the RPV upper head or penetration nozzles.

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There are no new commitments made in this letter. If you have any questions or require additional information, please contact Mr. Robert Walpole, Manager, Licensing at 914-734-6710.

Sincerely,

Robert W. Walpole
Manager, Licensing
Indian Point Energy Center

Attachments:

1. Reactor Pressure Vessel Upper Head Inspection Results: Indian Point 2, Spring 2008 Refueling Outage (2R18)

cc: Mr. John P. Boska, Senior Project Manager, NRC NRR DORL
Mr. Samuel J. Collins, Regional Administrator, NRC Region I
NRC Resident Inspector's Office, Indian Point Energy Center
Mr. Paul Eddy, New York State Department of Public Service
Mr. Paul D. Tonko, President NYSERDA

ATTACHMENT 1 to NL-08-097

Reactor Pressure Vessel Upper Head Inspection Results:
Indian Point 2, Spring 2008 Refueling Outage (2R18)

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

**Reactor Pressure Vessel Upper Head Inspection Results:
Indian Point 2, Spring 2008 Refueling Outage (2R18)**

Introduction

Entergy Nuclear Operations, Inc (ENO) performed an inspection of the Indian Point Unit 2 (IP2) reactor pressure vessel (RPV) upper head in March and April of 2008 in accordance with the requirements contained in NRC Revised Order EA-03-009 (Reference 1).

Based on the EDY (effective degradation years) methodology and criteria stated in Sections IV.A and IV.B of the Revised Order, ENO determined that the IP2 RPV head was in the moderate susceptibility category for the inspection conducted in 2R18. Section IV.C.(2) of the Revised Order specifies alternating inspections be performed using either bare metal visual (BMV) examination of 100% (95% with support structure interferences) of the RPV head surface (including 360° around each RPV head penetration nozzle), or, one of three nonvisual NDE (non-destructive examination) techniques applied to the RPV head penetration nozzles and J-groove welds. Since a nonvisual NDE was performed in the previous refueling outage (2R17), the inspection performed during 2R18 consisted of a visual inspection of the pressure retaining components above the RPV head and a BMV examination of no less than 95% of the RPV head surface and 360 degrees around each RPV head penetration nozzle. Section IV.D of the Revised Order specifies that visual inspections shall be performed during each refueling outage to identify potential boric acid leaks from pressure-retaining components above the RPV head. This inspection was completed in 2R18.

Based on this inspection, ENO concludes that there is no degradation of the RPV head surface or the RPV head penetration nozzles. Additional details regarding the inspections are provided in the following sections.

Bare Metal Visual (BMV) Examination

The BMV examination included no less than 95 percent of the entire RPV head surface (including 360° around each RPV head penetration nozzle). 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.

The BMV examination identified boron residue and boron stains/streaking on top of the RPV head caused by Conoseal leaks which occurred during cooldown to 2R18. All 97 RPV head penetration nozzles (for the Control Rod Drive Mechanisms) were inspected and it was confirmed that the source of the boron residue was not from

through-wall defects caused by PWSCC (primary water stress corrosion cracking) of the penetration tube base material or the J-groove weld material. Also, boron stains/streaking were observed outside the RMI support ring and shroud in the vicinity of Conoseal joints. The residue and stains/streaking were determined to be from the Conoseal leaks that were subsequently repaired during 2R18. Deposits of boron residue on the RPV head surface from this leak were cleaned as part of the examination process including the flange area outside of the shroud and from under the RMI support ring with no evidence of any active leakage from any penetration or evidence of base metal degradation.

The BMV examination results were evaluated by qualified Level II or Level III VT-2 personnel, meeting the requirements of ASME Section XI. The examiners also received familiarization pre-job training and reviewed previous inspection results from 2R17.

Visual Examination Above the Vessel Head Insulation

A visual inspection of pressure-retaining components above the RPV head was performed as required by Section IV.D of the Revised Order. As discussed above, leakage was observed to have occurred from various Conoseals.

Corrective Actions and Root Cause Determination

Based on the results of the BMV examinations, there were no indications of degradation of the RPV head penetrations or wastage of the RPV head base metal surface. Therefore, no corrective actions or root cause determinations were deemed necessary. The various Conoseals were repaired during 2R18 to prevent future leakage.

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.