Entergy Nuclear Northeast
Indian Point Energy Center
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Fred Dacimo
Site Vice President
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May 22, 2007

Re: Indian Point Unit 3
Docket No. 50-286
NL-07-066

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 Unit 3, Spring 2007 Refueling Outage (3R14)

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. 3 (TAC No. MC3195)", dated March 18, 2005.

3) NRC letter to Entergy, "Relaxation of First Revised Order on Reactor Vessel Nozzles, Indian Point Nuclear Generating Unit No. 3 (TAC No. MD0501)", dated July 17, 2006.

Dear Sir or Madam:

This letter provides the Reactor Vessel Upper Head Inspection Report (Attachment 1) for Indian Point Unit 3 (IP3), in accordance with Section IV.E of NRC First Revised Order, EA-03-009 (Reference 1). The inspection was performed during refueling outage 3R14 that was completed on March 30, 2007.

The inspection consisted of performing non-visual non-destructive examination (NDE) on all 78 Reactor Pressure Vessel (RPV) head penetration nozzles, a bare metal visual examination of no less than 95 percent of the RPV head surface and 360 degrees around each RPV head penetration nozzle, and a visual inspection of pressure-retaining components above the RPV head. This is consistent with NRC approval of Entergy Nuclear Operations, Inc (ENO) relaxation

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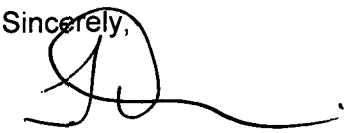
requests (References 2 and 3), and with the requirements of Section IV.C.(1) of the Order, based on the High Susceptibility Category as defined in section IV.B, and Section IV.D of the Order.

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. T.R. Jones, Manager, Licensing at (914) 734-6670.

Sincerely,



Fred R. Dacimo
Site Vice President
Indian Point Energy Center

Attachment 1 (Reactor Vessel Upper Head Inspection Results; Indian Point Unit 3, Spring 2007 Refueling Outage (3R14))

cc: see next page

cc: Mr. John P. Boska, Senior Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
U.S. Nuclear Regulatory Commission

Mr. Samuel J. Collins
Regional Administrator, Region 1
U.S. Nuclear Regulatory Commission

Resident Inspector's Office
Indian Point Unit 3 Nuclear Power Plant
U.S. Nuclear Regulatory Commission

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

Introduction

Entergy Nuclear Operations, Inc (ENO) performed an inspection of the Indian Point Unit 3 (IP3) reactor pressure vessel (RPV) head and vessel head penetration (VHP) nozzles in March 2007. The inspection complied with NRC Revised Order EA-03-009 (Reference 1) and with NRC approved Entergy Nuclear Operations, Inc (ENO) relaxation requests (References 2 and 3).

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 IP3 head was in the high susceptibility category for the inspection conducted in 3R14. Section IV.C.(1) of the Order specifies an inspection based on a bare metal visual (BMV) examination of the RPV head surface and non-visual NDE examination techniques applied to the vessel head penetration nozzles. The inspection performed at IP3 during 3R14, consisted of performing non-visual NDE on all 78 RPV nozzles, a bare metal visual examination of no less than 95% of the RPV head surface and 360 degrees around each RPV head penetration nozzle and a visual inspection of pressure-retaining components above the RPV head. This is consistent with NRC approval of Entergy Nuclear Operations, Inc (ENO) relaxation requests (References 2 and 3), and with the requirements of Section IV.C.(1) of the Order, based on the High Susceptibility Category as defined in section IV.B, and Section IV.D of the Order.

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

Non-visual NDE Examinations

ENO performed examinations of all 78 VHP nozzles by qualified personnel from WesDyne, a division of the Westinghouse Corporation, under the supervision of ENO personnel. The inside surface of the CRDM tube 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 3R14 inspections, 19 nozzles were found to have UT coverage of less than 1 inch below the lowest point of the root of the J-groove weld. However, the minimum required UT coverage below the J-groove weld was achieved consistent with NRC approved relaxation (Reference 3).

A UT assessment of the interference fit zone was also performed to determine if leakage had occurred into the annulus between the RPV head penetration nozzle and the RPV head for all 78 nozzles, with no evidence of leakage.

The non-visual NDE examination results were reviewed by UT certified Level III personnel, meeting the requirements of ASME Section XI.

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 4 and 5. 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 a Conoseal leak at penetration #76. All 78 penetrations were inspected by non-visual NDE which confirmed that the source of the boron residue was not a through wall defect caused by PWSCC 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 penetration #76. The residue and stains/streaking were also determined to be from the Conoseal leak at penetration #76 that was subsequently repaired during 3R14. 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 bare metal degradation. The top of the insulation was vacuumed to remove loose boron deposits.

The BMV examination 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 4 and 5, and inspection tapes from 3R13.

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.

In 3R15, IP3 will remain in the high susceptibility category and as such, expects to perform a vessel head inspection in accordance with the requirements of Section IV.C.(5)(a) and (b) of the Order, including NRC authorized relaxation requests.

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. 3 (TAC No. MC3195)", dated March 18, 2005.

3. NRC letter to Entergy, "Relaxation of First Revised Order on Reactor Vessel Nozzles, Indian Point Nuclear Generating Unit No. 3 (TAC No. MD0501)", dated July 17, 2006.

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

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