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May 31,2005

Re: Indian Point Unit 3
Docket No. 50-286
NL-05-044

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 2005 Refueling Outage (3R13)

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

4) NRC letter to Entergy, "Relaxation of First Revised Order on Reactor Vessel Nozzles, Indian Point Nuclear Generating Unit No. 3 (TAC No. MC6508)", dated April 4, 2005.

Dear Sir:

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 3R13 that was completed on April 7, 2005.

The inspection consisted of completing non-visual NDE on all remaining nozzles that were not inspected during 3R12, supplemented by non-visual NDE of additional nozzles where boric acid

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residue was identified on the outside surface of the head as well as additional inspections as allowed by the outage schedule. In addition a 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 was performed. This is consistent with NRC approval of Entergy Nuclear Operations, Inc (ENO) relaxation requests (References 3 and 4), and with the requirements of Section IV.C.(2) of the Order, based on the Moderate Susceptibility Category as defined in section IV.B of the Order. ENO consent to the Order (Reference 2) indicated that IP3 would perform the next (3R13) scheduled inspection in accordance with the requirements of the Order and approved relaxations. Subsequent relaxation requests (Reference 3 and 4) were authorized by the NRC to implement an alternative to the requirements of Section IV.C (5) 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. 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 Unit 3, Spring 2005 Refueling Outage (3R13))

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

ATTACHMENT 1 TO NL-05-044

REACTOR VESSEL UPPER HEAD INSPECTION RESULTS;

INDIAN POINT UNIT 3, SPRING 2005 REFUELING OUTAGE (3R13)

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

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 2005. 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)(Reference 3 and 4).

The results of the prior inspection, performed in April, 2003 during 3R12 were reported in Reference 7. 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 moderate susceptibility category for the inspection conducted in 3R13. 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 IP3 during 3R13, consisted of completing non-visual NDE on all remaining nozzles that were not inspected during 3R12, and by performing a bare metal visual examination of no less than 95% of the RPV head surface and 360 degrees around each RPV head penetration nozzles. This inspection was consistent with the alternative examination option authorized by NRC in Reference 3 and on the requirements of Section IV.B of the Order for a moderate susceptibility category ranked vessel head.

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 51 VHP nozzles total by qualified personnel from WesDyne, a division of the Westinghouse Corporation, under the supervision of ENO personnel. This included 41 nozzles that were not inspected or only partially inspected in 3R12, 7 nozzles which were identified with boron residue from leakage originating from above the vessel head and an additional 3 as allowed by the outage schedule.

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 3R13 inspections, 32 nozzles 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 51 VHP nozzles. During 3R13, ENO submitted a relaxation request (Reference 5) and supplemental information (Reference 6) to cover the 32 nozzles (from the 3R13 inspections) that were found to have less than 1 inch volumetric coverage below the lowest point below the J-groove weld. This also included one nozzle (penetration #78) that was

found to have a change in the reported length previously taken from a design drawing (Reference 3). The Reference 5 and 6 relaxation requests also identified four additional VHP nozzles (with data from 3R12 inspections) with a change in the reported length previously taken from a design drawing (Reference 3). The scan length change for one nozzle (penetration #74) changed from 0.96 inch to 1.00 inch, therefore now meeting the requirements of the Revised Order (Reference 1). Summarizing, the submitted relaxation requests covered a total of 36 nozzles. In Reference 4, the NRC authorized ENO's relaxation requests for all 36 RPV penetration nozzles (Reference 5 and 6).

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 51 nozzles, with no evidence of leakage.

The inspection results were reviewed by certified Level II or Level III VT-2 personnel, meeting the requirements of ASME Section XI.

Supplemental 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 8 and 9. 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.

Boron residue and boron stains/streaking caused by a conoseal leakage were identified on top of the RPV head adjacent to seven penetrations. These seven penetrations were inspected by non-visual NDE to confirm 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 at two locations outside the RMI support ring and shroud. The residue and stains/streaking were determined to be from a Conoseal leak at penetration #78 that was repaired at the end of 3R13. Deposits of boron residue on the RPV head surface from this leak were cleaned, as part of the examination process including from under the RMI support ring and the stains on the flange area outside of the shroud 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 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 8 and 9, and inspection tapes from 3R12.

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 3R14, IP3 is expected to be 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. 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. 3 (TAC No. MC3195)", dated March 18, 2005.

4. NRC letter to Entergy, "Relaxation of First Revised Order on Reactor Vessel Nozzles, Indian Point Nuclear Generating Unit No. 3 (TAC No. MC6508)", dated April 4, 2005.

5. Entergy letter to NRC dated March 30, 2005 (NL-05-040); "NRC First Revised Order EA-03-009; Revised Relaxation Request for Inspection of IP3 Reactor Pressure Vessel Head".

6. Entergy letter to NRC dated April 1, 2005 (NL-05-043); "NRC First Revised Order EA-03-009; Revised Relaxation Request for Inspection of IP3 Reactor Pressure Vessel Head-Supplemental Information".

7. Entergy letter to NRC dated June 12, 2003 (NL-03-098) "Reactor Vessel Head Inspection Results; Indian Point 3, Spring 2003 Refueling Outage".

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

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