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June 27, 2003
BW030054

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Braidwood Station, Unit 1
Facility Operating License No. NPF-72
NRC Docket No. STN 50-456

Subject: Braidwood Station Unit 1 60 Day Response to the Reporting Requirements of NRC Order EA-03-009, "Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads"

Reference:

- 1) Letter from U. S. NRC, "Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads," dated February 11, 2003.
- 2) Letter from K. R. Jury to U. S. NRC, "Answer to NRC Order to Modify Licenses Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads," dated February 28, 2003.

The purpose of this letter is to provide the Braidwood Station Unit 1 60 day response to the reporting requirements listed in Section IV, paragraph E of Reference (1). Braidwood Station, as part of the Exelon Generation Company, LLC, consented to Order EA-03-009 (Order) in Reference (2). The results of the visual inspections required by Section IV, paragraphs C and D of the Order are provided in the attachment to this letter. These inspections were performed during the recent Spring 2003 Braidwood Station Unit 1 refueling outage which concluded on May 2, 2003.

Since the Braidwood Station Unit 1 reactor pressure vessel (RPV) head has a low susceptibility to primary water stress corrosion cracking as defined by Section IV, paragraph B of the Order, the inspections consisted of visual examinations above the RPV head as well as a bare metal visual of 100% of the RPV head surface including 360 degrees around each RPV head penetration nozzle. The inspections verified the integrity of the Braidwood Station Unit 1 reactor pressure vessel head surface and penetrations with no degradation or pressure boundary leakage identified.

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Please direct any questions you may have regarding this submittal to Ms. Kelly Root,
Regulatory Assurance Manager, at (815) 417-2800.

I declare under penalty of perjury that the foregoing is true and accurate.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael J. Pacilio". The signature is fluid and cursive, with a large, stylized "M" and "P".

Michael J. Pacilio
Site Vice President
Braidwood Station

Attachment: Results of the Visual Inspections of the Braidwood Station Unit 1 Reactor
Vessel Head, (5 pages)

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Braidwood Station

Attachment

Results of the Visual Inspections of the Braidwood Station Unit 1 Reactor Vessel Head

The first of the two inspection requirements for the Braidwood Station Unit 1 reactor pressure vessel (RPV) head during the Spring 2003 refueling outage is contained in NRC Order EA-03-009 (Order), Section IV, paragraph C (3) and is summarized below.

- (3) For those plants in the Low category, RPV head and head penetration nozzle inspections shall be performed as follows. An inspection meeting the requirements of 3(a) must be completed at least every third refueling outage or every five (5) years, whichever occurs first. If an inspection meeting the requirements of 3(a) was not performed during the refueling outage immediately preceding the issuance of this Order, the Licensee must complete an inspection meeting the requirements of 3(a) within the first two (2) refueling outages following issuance of this Order.**

Paragraph (3)(a) states:

- (a) Bare metal visual examination of 100% of the RPV head surface, (including 360 degrees around each RPV head penetration nozzle).**

Response:

At the start of the Spring 2003 refueling Braidwood Unit 1 had an effective degradation year (EDY) value of 1.7.¹ Given that this EDY value was less than 8, Braidwood used the criteria of Section IV, paragraph B of the Order to assign the Braidwood Station Unit 1 RPV head to the "Low" primary water stress corrosion cracking (PWSCC) susceptibility category. Therefore in accordance with Section IV, paragraph C (3) of the Order; a bare metal visual examination was performed in the Spring 2003 refueling outage. This was the first refueling outage following issuance of the Order for Braidwood Station Unit 1.

The examination consisted of a qualified visual exam that covered 100% of the RPV surface including all 79 vessel head penetrations (VHPs). These VHPs include two Reactor Vessel Level Indication System (RVLIS) penetrations, 5 thermocouple penetrations, one vent pipe, 53 control rod drive mechanism penetrations, and 18 spare penetrations, (see Figure 1). The inspections were performed and the results evaluated by certified VT-1/VT-2/VT-3 examiners. The as-found and as-left examinations were performed using remote camera equipment with the inspections and results recorded on videotape.

¹ The Braidwood Unit 1 EDY determination was performed in accordance with the calculation in paragraph A of the Order.

Attachment

Results of the Visual Inspections of the Braidwood Station Unit 1 Reactor Vessel Head

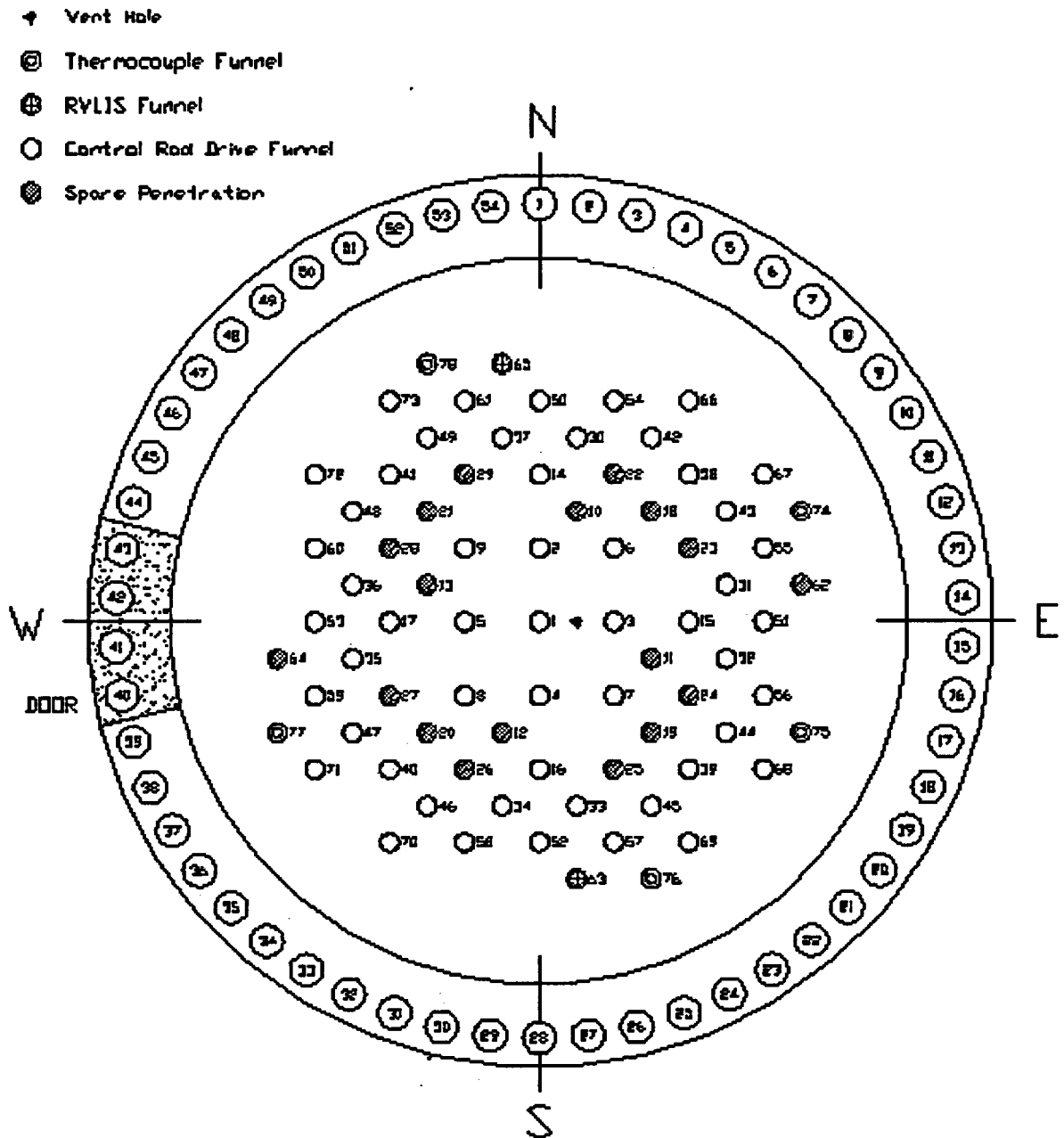


Figure 1
Braidwood Unit 1 VHP Map

Attachment

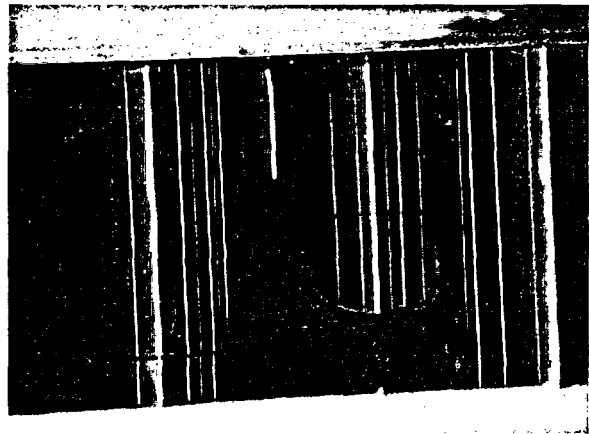
Results of the Visual Inspections of the Braidwood Station Unit 1 Reactor Vessel Head

Evidence of previous leakage was seen on several penetration housings². However, there were no fixed boric acid deposits on the RPV head surface. Loose deposits of boric acid trailing down from the penetration housings were negligible and were cleaned as part of the examination process. Post cleaning examinations revealed no evidence of any carbon steel head corrosion or wastage. In addition, debris accumulated around the VHPs that could interfere with leakage detection was vacuumed and a post cleaning examination was performed. There was no evidence of any active leakage or leakage from any VHPs or RPV surface degradation.

Provided below are photographs of four areas around the vessel that show the general as-found condition of the RPV surface.



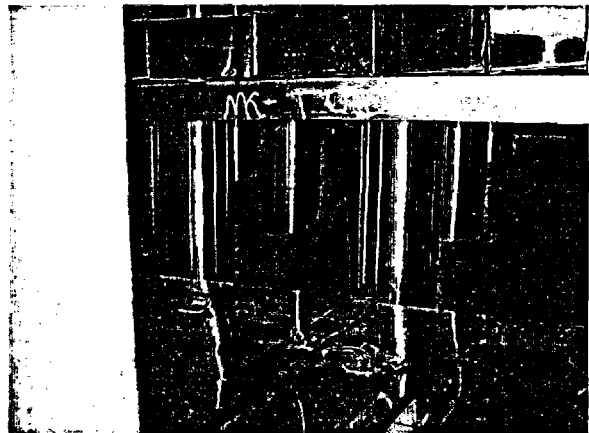
Photograph 1



Photograph 2



Photograph 3



Photograph 4

² The leakage from the RVLIS bolted connections was discussed in a letter from J. A. Benjamin (Exelon Generation Company, LLC) to NRC, "Exelon/AmerGen Response to NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity," dated April 1, 2002. This leakage occurred during a fill and vent evolution in the restart from the first Braidwood Station Unit 1 refueling outage in September 1989

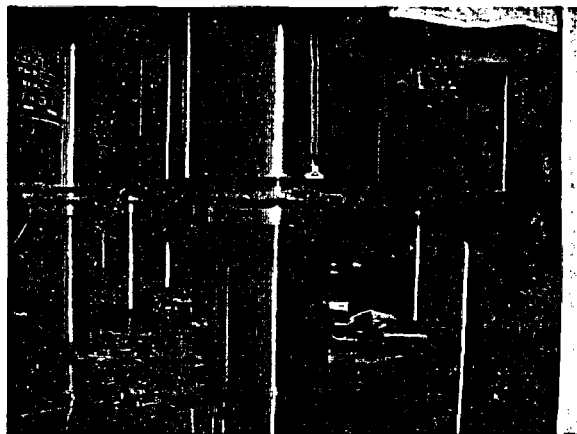
Attachment

Results of the Visual Inspections of the Braidwood Station Unit 1 Reactor Vessel Head

In addition, Paragraph D of the Order states:

- D. During each refueling outage, visual inspections shall be performed to identify potential boric acid leaks from pressure-retaining components above the RPV head. For any plant with boron deposits on the surface of the RPV head or related insulation, discovered either during the inspections required by this Order or otherwise and regardless of the source of the deposit, before returning the plant to operation the Licensee shall perform inspections of the affected RPV head surface and penetrations appropriate to the conditions found to verify the integrity of the affected area and penetrations.**

During the Boric Acid Corrosion Control Program inspections conducted shortly after Braidwood Station Unit 1 came off line for the Spring refueling outage, Braidwood Station Engineering personnel identified dried boric acid trails on 2 VHP housings. The boric acid staining was located above the surface of the RPV and above the RPV insulation on penetration 65, (Photograph 5) and, to a lesser degree on penetration 63.



Photograph 5

Condition Report 154512 was initiated and visual inspections were extended to all the areas above the RPV head insulation including the control rod drive mechanism, (CRDM) bolted and welded connections.³ The follow-up examinations identified dried, boric acid stains on CRDM housings adjacent to the VHP #65 RVLIS connection, (see Photograph 6). The boric acid staining was dry and inactive. Based on the location of this accumulation and the minor staining around VHP #63, it was suspected that these deposits were the result of the previous RVLIS connection leakage in 1989, (see

³ The Braidwood Unit CRDM design contains non-pressure retaining welds known as canopy seal welds. There are 3 canopy seal welds: lower, intermediate, and upper. The lower canopy seal weld is shown in Photograph 5 at the VHP to CRDM housing interface, just below the boric acid trail.

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Results of the Visual Inspections of the Braidwood Station Unit 1 Reactor Vessel Head

footnote 2). Three smear samples from the area around the RVLIS #65 connection were collected and analyzed for isotopic activity. Based on the age calculations for Cesium and Cobalt, the conclusion was that the deposits were greater than 12 years old and consistent with the 1989 RVLIS connection leakage.



RVLIS connection #65

Photograph 6

The affected areas around the #65 RVLIS connection including the area at the lower canopy seal location were cleaned, (Photograph 7). The bare metal visual, discussed above in response to Order Section IV, paragraph C (3), verified the integrity of the RPV head surface and VHPs at these locations.



Photograph 7