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U.S. Nuclear Regulatory Commission  
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Byron Station Unit 1  
Facility Operating License No. NPF-37  
NRC Docket No. STN 50-454

Subject: Byron Station Unit 1 Sixty-Day Response to NRC Order EA-03-009, "Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors"

On February 11, 2003, the NRC issued NRC Order EA-03-009, "Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors." This Order requires the following information be submitted to the NRC within 60 days after returning the plant to operation:

"For each inspection required in Paragraph C, the Licensee shall submit a report detailing the inspection results within sixty (60) days after returning the plant to operation."

The Order also requires the following information be submitted to the NRC within 60 days after returning the plant to operation if a leak or boron deposit was found during the inspection:

"For each inspection required in Paragraph D, the Licensee shall submit a report detailing the inspection results within sixty (60) days after returning the plant to operation if a leak or boron deposit was found during the inspection."

Pursuant to 10 CFR 2.202, "Orders," Attachment 1 to this letter provides the Byron Station, Unit 1 60-day response. This response is due to the NRC by December 15, 2003.

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Should you have any questions or desire additional information regarding this letter, please contact William Grundmann, Regulatory Assurance Manager, at (815) 406-2800.

Respectfully,



Stephen E. Kuczynski  
Site Vice President  
Byron Nuclear Generating Station

Enclosures: Attachment 1, Byron Station Unit 1 Sixty-Day Response to NRC Order  
EA-03-009

cc: Regional Administrator - NRC Region III  
NRC Senior Resident Inspector - Byron Station

**ATTACHMENT 1**

**Byron Station Unit 1**

**Sixty-Day Response to NRC Order EA-03-009**

**"Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors"**

## Attachment 1

### Byron Station Unit 1

#### Sixty-Day Response to NRC Order EA-03-009

On February 11, 2003, the NRC issued NRC Order EA-03-009, "Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors." Section E of this Order requires the following information be submitted to the NRC within 60 days after returning the plant to operation:

- E. For each inspection required in Paragraph C, the Licensee shall submit a report detailing the inspection results within sixty (60) days after returning the plant to operation. For each inspection required in Paragraph D, the Licensee shall submit a report detailing the inspection results within sixty (60) days after returning the plant to operation if a leak or boron deposit was found during the inspection.*

#### Response to NRC Order Item E Concerning Paragraph C

Paragraph C, Item 3 (i.e., for plants in the low primary water stress corrosion cracking (PWSCC) susceptibility category) of this Order requires the following inspections:

- (3) For those plants in the Low category, [reactor pressure vessel] 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. The requirements of 3(b) must be completed at least once over the course of five (5) years after the issuance of this Order and thereafter at least every four (4) refueling outages or every seven (7) years, whichever occurs first.*
- (a) Bare metal visual examination of 100% of the RPV head surface (including 360° around each RPV head penetration nozzle).*
- (b) Either:*
- (i) Ultrasonic testing of each RPV head penetration nozzle (i.e., nozzle base material) from two (2) inches above the J-groove weld to the bottom of the nozzle and an assessment to determine if leakage has occurred into the interference fit zone, OR*
- (ii) Eddy current testing or dye penetrant testing of the wetted surface of each J-Groove weld and RPV head penetration nozzle base material to at least two (2) inches above the J-groove weld.*

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A remote bare metal visual inspection of the Unit 1 RPV head was performed during Byron Unit 1 refueling outage 12 (B1R12) in Fall 2003, to meet the requirements of Item 3(a). The inspection included an examination around the full circumference of each RPV head penetration nozzle (i.e., 78 control rod drive mechanism (CRDM) nozzles and the RPV head vent line) and the RPV head surface to provide 100% coverage of the RPV head. No evidence of CRDM or RPV head vent line boric acid leakage and no evidence of any wastage was observed. However, boric acid residue was identified on several CRDM nozzles that trailed down onto the RPV head surface. This residue was attributed to previously identified leakage (i.e., RPV head vent isolation valve leakage identified in Spring 1990 and conoseal leakage identified in Fall 1997). This residue was cleaned from the RPV head and the CRDM nozzles leaving the annulus region between the nozzles clean such that any future leakage would be easily identified. As noted above, this residue caused no RPV head wastage.

The inspection was performed in accordance with procedure ER-AP-335-1012, "Visual Examination of PWR Reactor Vessel Head Penetrations." The inspection, performed by VT-2 certified personnel, used a pole-mounted camera connected to a video recorder/monitor that provided the examiner with immediate access to the examination surfaces. The inspection used remote equipment capable of resolving the appropriate detail (i.e., VT-1/1C character height in accordance with 1992 ASME Boiler and Pressure Vessel Code Section XI, Table IWA-2210-1) at two feet. The actual distances viewed were less than two feet, which gave extremely close views of the nozzle to interface region, thereby ensuring any boric acid leakage would be easily identified.

The inspection to meet the requirements of Item 3(b) is not required at this time and will be performed in a future refueling outage.

### Response to NRC Order Item E Concerning Paragraph D

Paragraph D required the following inspections:

*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.*

VT-2 certified examiners performed a visual inspection to identify potential boric acid leaks from pressure-retaining components above the RPV head. This inspection was performed during the B1R12 shutdown as part of the Mode 3 walkdown. Each of the doors on the integrated RPV head package was opened and the areas around the CRDMs were examined. No evidence of current boric acid leakage was found above the RPV head that could be attributed to the boric acid residue later found on the CRDM nozzles and RPV head surface noted above. As detailed in the response to Item E concerning Paragraph C above, inspections of the affected RPV head surface and penetrations (i.e., areas found

## Attachment 1

with boric acid residue) were performed prior to returning the plant to operation to verify the integrity of the affected RPV head surface area and penetrations.