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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, "First Revised NRC Order EA-03-009 Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors"

On February 11, 2003, the NRC issued Order EA-03-009 for interim inspection requirements for reactor pressure vessel (RPV) heads at pressurized water reactor (PWR) facilities. On February 20, 2004, the NRC issued the First Revised Order EA-03-009 (the Order), which superseded Order EA-03-009. Revision 1 of the Order modified the requirements regarding nondestructive examination of the penetration nozzles. 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 June 13, 2008.

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There are no regulatory commitments contained in this letter.

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

Respectfully,



David M. Hoots
Site Vice President
Byron Nuclear Generating Station

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

ATTACHMENT

Byron Station Unit 1

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

**“First Revised NRC Order EA-03-009 Establishing Interim
Inspection Requirements for Reactor Pressure Vessel Head
at Pressurized Water Reactors”**

Attachment

Byron Station Unit 1

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

On February 11, 2003, the NRC issued Order EA-03-009 for interim inspection requirements for reactor pressure vessel (RPV) heads at pressurized water reactor (PWR) facilities. On February 20, 2004, the NRC issued the First Revised Order EA-03-009 (the Order), which superseded Order EA-03-009. Revision 1 of the Order modified the requirements regarding nondestructive examination of the penetration nozzles. 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, RPV head and head penetration nozzle inspections shall be performed as follows. An inspection meeting the requirements of paragraph IV.C.(5)(a) must be completed at least every third refueling outage or every 5 years, whichever occurs first. If an inspection meeting the requirements of paragraph IV.C.(5)(a) was not performed during the last refueling outage prior to February 11, 2003, the Licensee must complete an inspection meeting the requirements of paragraph IV.C.(5)(a) within the first 2 refueling outages after February 11, 2003. The requirements of paragraph IV.C.(5)(b) must be completed at least once prior to February 11, 2008, and thereafter, at least every 4 refueling outages or every 7 years, whichever occurs first.*
- (5) Inspections of the RPV head shall be performed as directed in paragraphs IV.C.(1), IV.C.(2), IV.C.(3) and IV.C.(4) using the following techniques:*
- (a) Bare metal visual examination of 100 percent of the RPV head surface (including 360° around each RPV head penetration nozzle). For RPV heads with the surface obscured by support structure interferences which are located at RPV head elevations downslope from the outermost RPV head penetration, a bare metal visual inspection of no less than 95 percent of the RPV head surface may be performed provided that the examination shall include those areas of the RPV head upslope and downslope from the structure interference to identify any evidence of boron or corrosive product. Should any evidence of boron or corrosive product be identified, the licensee shall*

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examine the RPV head surface under the support structure to ensure that the RPV head is not degraded.

- (b) *For each penetration, perform a nonvisual NDE in accordance with either (i), (ii), or (iii):*
- (i) *Ultrasonic testing of each RPV head penetration nozzle (i.e., nozzle base material) from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 2 inches below the lowest point at the toe of the J-groove weld on a horizontal plane perpendicular to the nozzle axis (or the bottom of the nozzle if less than 2 inches [see Figure IV-1]; OR from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 1.0 inch below the lowest point at the toe of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) and including all RPV head penetration nozzle surfaces below the J-groove weld that have an operating stress level (including all residual and normal operation stresses) of 20 ksi tension and greater (see Figure IV-2). In addition, an assessment shall be made to determine if leakage has occurred into the annulus between the RPV head penetration nozzle and the RPV head low-alloy steel.*
 - (ii) *Eddy current testing or dye penetrant testing of the entire wetted surface of the J-groove weld and the wetted surface of the RPV head penetration nozzle base material from 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) to 2 inches below the lowest point at the toe of the J-groove weld on a horizontal plane perpendicular to the nozzle axis (or the bottom of the nozzle if less than 2 inches [see Figure IV-3]); OR from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 1.0 inch below the lowest point at the toe of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) and including all RPV head penetration nozzle surfaces below the J-groove weld that have an operating stress level (including all residual and normal operation stresses) of 20 ksi tension and greater (see Figure IV-4).*
 - (iii) *A combination of (i) and (ii) to cover equivalent volumes, surfaces and leak paths of the RPV head penetration nozzle base material and J-groove weld as described in (i) and (ii). Substitution of a portion of a portion of a volumetric exam on a nozzle with a surface examination may be performed with the following requirements:*
 - 1. *On nozzle material below the J-groove weld, both the outside diameter and inside diameter surfaces of the nozzle must be examined.*

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2. *On nozzle material above the J-groove weld, surface examination of the inside diameter surface of the nozzle is permitted provided a surface examination of the J-groove weld is also performed.*

The inspections to meet the requirements of Item 5(a) was completed and is described below. Item 5(b) are not required at this time and will be performed in a future refueling outage.

A remote bare metal visual inspection of the Unit 1 RPV head was performed during B1R15, to meet the requirements of Item 5(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.

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.*

As required by Reference 1, Section IV, paragraph D, a visual inspection to identify potential boric acid leaks from pressure-retaining components above the RPV head was performed at the beginning and end of Byron Station, Unit 1 Refueling Outage 15 (i.e., B1R15) starting in March 2008. The visual inspections did not identify any boric acid leaks from pressure-retaining components above the RPV head or any boron deposits on the mirror insulation above the RPV head.

Since no leakage or boron deposits were identified during these inspections, a report in accordance with Reference 1, Section IV, paragraph E, is not required to be submitted; however, the inspection results are being provided to assure thorough communications regarding First Revised NRC Order EA-03-009 actions.