Progress Energy

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SERIAL: HNP-03-118
10 CFR 50.54(f)

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U.S. Nuclear Regulatory Commission
ATTN: NRC Document Control Desk
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1
DOCKET NO. 50-400/LICENSE NO. NPF-63

90-DAY RESPONSE TO NRC BULLETIN 2003-02 FOR LEAKAGE FROM REACTOR PRESSURE VESSEL LOWER HEAD PENETRATIONS AND REACTOR COOLANT PRESSURE BOUNDARY INTEGRITY

Ladies and Gentlemen:

On August 21, 2003, the Nuclear Regulatory Commission (NRC) issued NRC Bulletin 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity." The NRC Bulletin requested PWR addresses entering a refueling outage after December 31, 2003, to provide a response within 90 days of the date of the bulletin. Pursuant to 10 CFR 50.54(f), attached is the 90 day response to the subject NRC Bulletin for the Harris Nuclear Plant (HNP).

Attachment 1 to this letter provides the information requested in Items 1, 1(a), 1(b), 1(c) and 1(d) of the Bulletin. The report requested in Item 2 will be submitted, as requested, within 60 days after plant startup following the next inspection.

Attachment 1 concludes that HNP satisfies the applicable regulatory requirements related to the integrity of the Reactor Pressure Vessel Lower Head Penetrations.

Please refer any questions regarding this submittal to Mr. John Caves, Supervisor – Licensing/Regulatory Programs, at (919) 362-3137.

Sincerely,

James Scarola

JS/mgw

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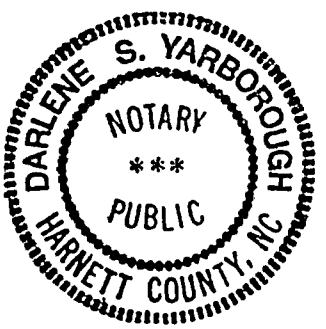
Attachments

1. NRC Bulletin 2003-02 Response
2. References
3. Commitments

Jim Scarola, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge, and belief and the sources of his information are employees, contractors, and agents of Progress Energy Carolinas, Inc.

Darlene S. Yarborough
Notary (Seal)



My commission Expires: 2-21-2005

c: Mr. R. A. Musser (NRC Senior Resident Inspector)
Ms. B. O. Hall (Section Chief, N.C. DENR)
Mr. C. P. Patel (NRR Project Manager, NRC)
Mr. L. A. Reyes (NRC Regional Administrator, Region II)

SERIAL: HNP-03-118

PROGRESS ENERGY CAROLINAS, INC.

SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1

DOCKET NO. 50-400/LICENSE NO. NPF-63

ATTACHMENTS

90-Day Response for NRC Bulletin 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity"

Attachment 1 to Letter HNP-03-118
NRC Bulletin 2003-02 Response

Introduction

On August 21, 2003, the Nuclear Regulatory Commission (NRC) issued Bulletin 2003-02, Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity." In the bulletin, the NRC requested specific information concerning licensees' Reactor Pressure Vessel (RPV) lower head penetration inspection program. The NRC requested the information be provided as follows:

NRC Request

1. All subject PWR addressees are requested to provide the following information. The responses for facilities that will enter refueling outages before December 31, 2003, should be provided within 30 days of the date of this bulletin. All other responses should be provided within 90 days of the date of this bulletin.

Response

Since the Harris Nuclear Plant (HNP) will not enter a refueling outage prior to December 31, 2003, the HNP response is being provided within 90 days of the date of this bulletin.

NRC Request

1(a) A description of the RPV (Reactor Pressure Vessel) lower head penetration inspection program that has been implemented at your plant. The description should include when the inspections were performed, the extent of the inspections with respect to the areas and penetrations inspected, inspection methods used, the process used to resolve the source of findings of any boric acid deposits, the quality of the documentation of the inspections (e.g., written report, video record, photographs), and the basis for concluding that your plant satisfies applicable regulatory requirements related to the integrity of the RPV lower head penetrations.

Response

As explained in the HNP response (Reference 1) to the NRC Request for Additional Information concerning NRC Bulletin 2002-01 (Reference 2), inspections of the Bottom Mounted Instrumentation (BMI) penetrations at HNP have been performed as part of the ASME Section XI Class 1 system leakage test. This test is performed each refueling outage with the system at normal operating pressure and temperature, with the insulation in place. These inspections were performed by HNP plant procedure (EST-227) in accordance with ASME Section XI requirements, and were documented on a system pressure test report in accordance with the HNP ASME Section XI Program.

In addition, a visual examination of borated system pressure boundary components in the Containment Building, including the lower head penetration area (with the insulation in place) is performed near the beginning of each refueling outage (RFO), as part of HNP's Boric Acid Corrosion Control Program. There have been no leakage of the RPV lower head penetrations identified as a result of these program required inspections.

During RFO 11 (Spring 2003), the HNP program required inspections were supplemented in response to industry experience at the South Texas Project Unit 1 (STP-1) plant. HNP performed a 100% bare metal visual (BMV) examination of all 50 BMI penetrations. For this examination, insulation was removed to permit access to the bottom of the vessel in order to perform a direct visual exam. This inspection meets the industry's Materials Reliability Program (MRP) recommendation for PWR licensees to perform a bare metal visual inspection of their BMI penetrations during the current or next refueling outage. The recommendations were included in a letter from Leslie Hartz, Chair, MRP Senior Representatives, dated June 23, 2003 (Reference 6). The results of this inspection were reported to the NRC in HNP's submittal, dated July 16, 2003, detailing the results of the RFO 11 RPV head inspection (Reference 4).

The BMV inspection performed in RFO 11 was a VT-2 examination of each nozzle. The visual examination personnel were certified in accordance with the Progress Energy Carolinas, Inc's written practice and ASME Section XI, and supplemented by the March 2002 EPRI report (Reference 5), as applicable, for the lower head penetrations. Personnel included Level II and III examiners with previous experience performing RPV head exams.

The entire (i.e., 100%) circumference of each nozzle at the intersection of the nozzle and bottom head OD was examined. Sufficient lighting was provided by flashlights and a 500,000 candle power light. The results of these exams were recorded on a VT-2 data sheet. After the official examination was performed, each nozzle penetration was videotaped using a digital video recorder for documentation of the as-found condition and in order to establish a baseline for future inspections.

The acceptance criteria used for the inspection was the same that was used for the RPV top head BMV inspection. These criteria are specified in HNP plant procedure EPT-859 and are consistent with EPRI guidance (Reference 5).

While some streaking and staining was discovered, the result of temporary refueling cavity seal ring leaks which occurred prior to 1997 (the ring was replaced with a permanent seal ring in 1997), the nozzles and the vessel surface were determined to be acceptable by inspection without further evaluation. This conclusion was based on the fact that there were no boric acid deposits or other conditions that required evaluation or which masked the underlying metal. Careful inspection of the annulus region around each penetration confirmed that there was no evidence of leakage emanating from these locations.

To further assess the condition, the streaks were wiped down with wet rags and were easily eliminated, thereby confirming that none of the streaks were tightly adherent. A post-cleaning examination confirmed the absence of corrosion or wastage. Several photographs were taken of the area documenting the as-left cleanliness.

Although there were no findings of boric acid deposits which required evaluation, such findings would have been documented under the HNP Corrective Action Program and formally evaluated. Evidence would have been collected and the source of such deposits determined. The underlying metal surface would be visually inspected for wastage and the condition evaluated for operability. The process for evaluating the discovery of boric acid deposits is described in procedure EGR-NGGC-0207, which governs HNP's Boric Acid Corrosion Control Program.

The basis for concluding that the HNP Boric Acid Corrosion Control Program satisfies applicable regulatory and Code requirements was provided in the HNP response to the NRC's Request for Additional Information on Bulletin 2002-01 (Reference 1, Question 9), and in the HNP 60-Day Response to Bulletin 2002-01 (Reference 3). Furthermore, as described above, HNP has been proactive in responding to industry experience by implementing additional and more detailed inspections for the BMI penetrations, which exceed ASME Code, Section XI, and 10 CFR 50.55a, "Codes and Standards," requirements for the examination, evaluation, and repair of code class components. This inspection program will ensure that the structural and leakage integrity of the RPV lower head penetrations is maintained.

NRC Request

1(b) A description of the RPV lower head penetration inspection program that will be implemented at your plant during the next and subsequent refueling outages. The description should include the extent of the inspections which will be conducted with respect to the areas and penetrations to be inspected, inspection methods to be used, qualification standards for the inspection methods, the process used to resolve the source of findings of boric acid deposits or corrosion, the inspection documentation to be generated, and the basis for concluding that your plant will satisfy applicable regulatory requirements related to the structural and leakage integrity of the RPV lower head penetrations.

Response

As discussed in 1(a), inspections of the BMI penetrations at HNP have been and will continue to be performed as part of the ASME Section XI Class 1 system leakage test. This inspection is performed at each refueling outage with the system at normal operating pressure and temperature, with insulation on. These inspections are VT-2 exams performed by HNP plant procedure (EST-227) in accordance with ASME Section XI requirements, and are documented on a system pressure test report in accordance with the HNP ASME Section XI Program.

In addition, a visual examination of borated system pressure boundary components in the Containment Building is performed near the beginning of each RFO, as part of the Boric Acid Corrosion Control Program. However, in response to industry experience, this examination will be enhanced to require the RPV lower head inspection to be performed during the next RFO (12) (Fall 2004) as a direct (i.e., bare metal) visual (VT-2) exam of the lower head surface and BMI penetrations.

Visual aids, as necessary, and visual examination personnel will be certified in accordance with Progress Energy's written practice and ASME Section XI, as supplemented by the March 2002 EPRI report (Reference 5), as applicable, for the lower head penetrations.

Each finding of boric acid deposits or corrosion will be documented. The examination will be documented by a report signed by the certified VT-2 examiner that performed the examination. Video and photographic images taken to support the examination findings will supplement the report as necessary. The source of the boric acid deposits will be identified. Collection of samples for chemical and/or isotopic analysis would be used as appropriate to help identify the source and/or determine the age of the deposits.

HNP will utilize the Boric Acid Corrosion Control Program and the Corrective Action Program, as applicable, to evaluate findings of boric acid deposits or corrosion during the BMI penetration examinations. The process will include evaluations to determine if such findings are acceptable, based on criteria which are pre-defined and consistent with EPRI guidance (Reference 5) and industry experience.

The basis for concluding that the HNP Boric Acid Corrosion Control Program satisfies applicable regulatory and Code requirements was provided in the HNP response to the NRC's Request for Additional Information on Bulletin 2002-01 (Reference 1, Question 9), and in the HNP 60-Day Response to Bulletin 2002-01 (Reference 3). Furthermore, as described above, HNP has been proactive in responding to industry experience by implementing additional and more detailed inspections for the BMI penetrations, which exceed ASME Code, Section XI, and 10 CFR 50.55a, "Codes and Standards," requirements for the examination, evaluation, and repair of code class components. This inspection program will ensure that the structural and leakage integrity of the RPV lower head penetrations is maintained.

HNP will continue to monitor industry experience and MRP recommendations to ensure our inspection plans are prudent based on the knowledge available in order to ensure that the structural and leakage integrity of the RPV lower head penetrations is maintained.

NRC Request

1(c) If you are unable to perform a bare-metal visual inspection of each penetration during the next refueling outage because of the inability to perform the necessary planning, engineering, procurement of materials, and implementation, are you planning to perform bare-metal visual inspections during subsequent refueling

outages? If so, provide a description of the actions that are planned to enable a bare-metal visual inspection of each penetration during subsequent refueling outages. Also, provide a description of any penetration inspections you plan to perform during the next refueling outage. The description should address the applicable items in paragraph (b).

Response

As stated in the response to 1(a) above, HNP has completed a 100% bare metal visual examination of all 50 BMI penetrations during RFO 11 (Spring 2003). HNP intends to perform a bare metal visual inspection of BMI penetrations during the next RFO (12) scheduled for Fall 2004. Therefore, this question is not applicable to HNP.

NRC Request

1(d) If you do not plan to perform either a bare-metal visual inspection or non-visual (e.g., volumetric or surface) examination of the RPV lower head penetrations at the next or subsequent refueling outages, provide the basis for concluding that the inspections performed will assure applicable regulatory requirements are and will continue to be met.

Response

As stated in the response to 1(a) above, HNP has performed a 100% bare metal visual examination of all 50 BMI penetrations during RFO 11 (Spring 2003). HNP intends to perform a bare metal visual inspection of BMI penetrations during the next RFO (12) scheduled for Fall 2004. Therefore, this question is not applicable to HNP.

NRC Request

2. *Within 60 days of plant restart following the next inspection of the RPV lower head penetrations, the subject PWR addressees should submit to the NRC a summary of the inspections performed, the extent of the inspections, the methods used, a description of the as-found condition of the lower head, any findings of relevant indications of through-wall leakage, and a summary of the disposition of any findings of boric acid deposits and any corrective actions taken as a result of indications found.*

Response

HNP submitted a summary of the results of the 100% bare metal visual examination of the BMI penetrations performed during RFO 11 in our sixty-day report (Reference 4), issued in accordance with NRC Order EA-03-009. Additional required detail on the performance of this examination has been provided in the response to 1(a) above. HNP will submit the results of the next inspection of the RPV lower head penetrations,

currently planned for the next refueling outage (RFO12) in Fall 2004, within 60 days of plant startup following the inspection.

Attachment 2 to Letter HNP-03-118
References

1. CP&L to NRC letter, HNP-02-164, dated January 24, 2003, Harris Nuclear Plant – Request for Additional Information, Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity"
2. NRC to Carolina Power & Light, (CP&L) letter, dated November 22, 2002, Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity, 60-Day Response for Harris Nuclear Plant, Unit 1 - Request for Additional Information (TAC No. MB4549)"
3. CP&L to NRC letter, HNP-02-063, dated May 15, 2002, Harris Nuclear Plant – 60-Day Response to Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity"
4. PEC to NRC letter, HNP 03-070, dated July 16, 2003, "Sixty-Day Report in Accordance with NRC Order for Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors Inspection of RPV Head During Refueling Outage"
5. Visual Examination for Leakage of PWR Reactor Head Penetrations on Top Of RPV Head, Revision 1 of 1006296, March 2002, EPRI Report 1006899
6. MRP letter, MRP 2003-017, dated June 23, 2003, "Recommendation for PWR Owners with Alloy 600 Bottom Mounted Vessel Instrumentation Nozzles"

Attachment 3 to Letter HNP-03-118
Commitments

The actions committed to by Progress Energy Carolinas, Inc. in this document are identified below. Any other actions discussed in this submittal represent intended or planned actions by Progress Energy Carolinas, Inc. They are described for the NRC's information and are not regulatory commitments.

Commitments	Scheduled Completion Dates
HNP will perform a bare metal visual inspection of the RPV lower head surface and penetrations during the next refueling outage (RFO12) scheduled for Fall 2004.	Fall 2004