

NRC 2003-0089

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BL 2003-02

September 22, 2003

U S Nuclear Regulatory Commission  
ATTN: Document Control Desk  
11555 Rockville Pike  
Rockville, Maryland 20852

POINT BEACH NUCLEAR PLANT  
DOCKETS 50-266 AND 50-301


**NUCLEAR REGULATORY COMMISSION BULLETIN 2003-02: LEAKAGE FROM REACTOR PRESSURE VESSEL LOWER HEAD PENETRATIONS AND REACTOR COOLANT PRESSURE BOUNDARY INTEGRITY – 30-DAY RESPONSE**

On August 21, 2003, the Nuclear Regulatory Commission (NRC) transmitted Bulletin (BL) 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity." The NRC required that specific information be provided within 30 days of the date of the BL for those facilities that will enter refueling outages before December 31, 2003. In accordance with this requirement, Nuclear Management Company, LLC (NMC) is providing the 30-day response for the Point Beach Nuclear Plant.

This letter contains two new commitments and no revisions to existing commitments. The new commitments are:

1. NMC will attempt, during the upcoming Unit 1 and Unit 2 refueling outages, a 100% bare-metal visual exam of the lower Reactor Pressure Vessel (RPV) dome including each bottom-mounted instrumentation (BMI) penetration to RPV junction. It is possible that unforeseen circumstances will prevent a complete 100% bare-metal visual exam, but NMC will modify, as necessary, the inspection process or the insulation (based on the lessons learned during this inspection) to ensure the ability to perform 100% bare-metal examinations in subsequent outages.
2. NMC will perform a 100% bare-metal visual exam of the lower RPV dome including each BMI penetration to RPV junction. This examination will be completed on each unit during refueling outages subsequent to the upcoming Unit 1 and 2 refueling outages.

I declare under penalty of perjury that the foregoing is true and accurate. Executed on  
September 22, 2003.



A. J. Cayia  
Site Vice President

LAS/kmd

cc: Regional Administrator, USNRC, Region III  
Project Manager, Point Beach Nuclear Plant, USNRC, NRR  
NRC Resident Inspector – Point Beach Nuclear Plant

Attachment

**ATTACHMENT**

**NUCLEAR MANAGEMENT COMPANY, LLC**

**POINT BEACH NUCLEAR PLANT  
DOCKETS 50-266 AND 50-301**

**NRC 2003-0089**

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***Requested Information***

- (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**

Nuclear Management Company, LLC (NMC) is providing a 30-day response in accordance with Nuclear Regulatory Commission (NRC) Bulletin (BL) 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity," for the Point Beach Nuclear Plant.

***Requested Information***

- (a) *A description of the RPV 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**

The current PBNP program for RPV inspection specifies that the RPV lower head penetrations are examined in accordance with ASME B&PV Code, Section XI, 1998 Edition, 2000 Addenda. Visual examinations (VT-2) are performed under the reactor vessel with insulation in place as allowed per IWA-5242. These VT-2 examinations have been performed at the specified refueling frequency specified in ASME B&PV Code, Section XI for system pressure tests. In addition, PBNP performs an as-found examination early during every refueling outage to provide an opportunity for further investigation should the need arise. These examinations are documented with written records. Photographic evidence has been used in some instances to record evidence of refueling cavity water leakage.

During a recent forced outage of Point Beach Unit 1 in July 2003, a small amount of boric acid was seen on the lower RPV insulation. These deposits were carefully evaluated and determined to be a result of past refueling cavity water leakage based on visual, physical, and chemical evidence.

These inspections as well as those of the Boric Acid Control and Leakage Monitoring Program (BACLM) and Section XI Program examinations (described in the Point Beach responses to bulletins BL2002-01 and BL2002-02) ensure compliance with all applicable regulatory requirements related to the integrity of the RPV & lower head penetrations.

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***Requested Information***

- (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**

**Insulation Description**

The Point Beach Units 1 & 2 RPVS are installed with mirror-type insulation at the lower RPV dome. This insulation generally conforms to the contour of the lower RPV dome but has a gap of approximately one to three inches between the RPV surface and the insulation. Each BMI penetration has a slight gap between the insulation and the BMI tube material. This annular gap varies in size (approximately one half inch) and is normally covered by metal flashing.

**Inspection Plans**

The next Point Beach Unit 1 and Unit 2 refueling outages are planned to be conducted in April 2004 and October 2003 respectively. A bare-metal visual (BMV) examination of the lower RPV dome including the BMI to RPV junction will be performed during these outages. If limitations exist during performance of these examinations, lessons learned will be incorporated and changes will be made to ensure that a 100% BMV exam will be performed during subsequent refueling outages.

Any evidence of boric acid will be evaluated to determine the source, extent of leakage and possible extent of cracking. Detection of cracking may require characterization by non-destructive methods as applicable and comparison to the acceptance criteria specified in ASME Section XI. Any indication of cracking will be evaluated in accordance with the methodology of ASME Section XI.

Personnel performing visual examinations will be VT-2 qualified. Qualification requirements for these visual examinations will be in accordance with the requirements of ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through 2000 Addenda. The acceptance criterion will be zero leakage from the reactor head and penetration nozzles. Examination methods may include fixed, pole-mounted, or robotic video, still photography, or direct visual examination. Written and photographic evidence will be used to document each examination. Although the examiner will be VT-2 qualified, this will not be an ASME Section XI VT-2 examination subject to the pressure and temperature requirements, hold times, and other requirements specific to the performance of a code-required system pressure test.

The long-term examination plans will include BMV exams of the BMI to RPV junction during each refueling outage. This will continue until industry experience, changes to the ASME code, or a change in regulatory requirements justify a change to the inspection frequency or method.

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These examinations as well as those of the BACLM and Section XI Program examinations (described in the Point Beach responses to NRC Bulletins BL 2002-01 and BL 2002-02) ensure compliance to all applicable regulatory requirements related to the integrity of the RPV & lower head penetrations.

**Resolution of Possible Boric Acid Deposits**

As stated in BL 2003-02, evidence of past leakage from refueling operations may be present in the vicinity of the BMIs. NMC understands the importance of accurate analyses and inspections to differentiate between RCS leakage and refueling water leakage.

NMC will fully document the as-found condition of suspect deposits whether adhering to the RPV lower head or present on the insulation facing the RPV. All such deposits will be carefully evaluated to determine the most likely origin of the material based on visual, physical, and chemical evidence. Visual evidence will be evaluated with consideration of the guidance and examples given in industry reference materials for similar inspections of RPV upper heads supplemented by the recent observed conditions at the South Texas Project. When deemed appropriate relevant physical evidence will be carefully collected to provide reliable, documented data for use in the evaluation process. Chemical and radio isotopic analysis techniques may be employed where appropriate to help discriminate between deposits with operational versus outage-related sources.

***Requested Information***

- (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 described above, the goal for the upcoming Point Beach Units 1 and 2 refueling outages is to complete a 100% BMV examination of each BMI penetration. If some currently unforeseen circumstance prevents the ability to examine each penetration, NMC will apply lessons learned to ensure a bare-metal examination of each penetration is performed during the next refueling outage. Until the lessons learned from the upcoming examination are evaluated, NMC is unable to specify in detail and with certainty what actions will be taken to enable a 100% BMV examination of each penetration during the subsequent refueling outage. These actions may include modification of the reactor vessel insulation or the use of alternative examination techniques.

***Requested Information***

- (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*

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*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 described above, NMC plans to perform BMV examinations of the lower RPV head and BMI to RPV junction at the next and subsequent refueling outages at Point Beach Units 1 and 2.