NMC
Committed to Nuclear Excellence

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U S Nuclear Regulatory Commission
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PRAIRIE ISLAND NUCLEAR GENERATING PLANT
DOCKET 50-282 and 50-306
LICENSE No. DPR-42 and DPR-60
NRC BULLETIN 2002-01: REACTOR PRESSURE VESSEL HEAD DEGRADATION AND REACTOR COOLANT PRESSURE BOUNDARY INTEGRITY – 60-DAY RESPONSE
(TAC NOs. MB4568 and MB4569)

On March 18, 2002, the Nuclear Regulatory Commission (NRC) transmitted Bulletin (BL) 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity." By letter dated April 3, 2002, Nuclear Management Company, LLC (NMC) submitted the required 15-day response to the BL for the Prairie Island Nuclear Generating Plant. The NRC also required that specific information be provided within 60 days of the date of the BL. In accordance with this requirement, NMC is providing the 60-day response for the Prairie Island Nuclear Generating Plant.

This letter contains no new commitments and no revisions to existing commitments.

I declare under penalty of perjury that the foregoing is true and accurate. Executed on May 17, 2002.

Mano K. Nazar
Site Vice President, Prairie Island Nuclear Generating Plant

cc Regional Administrator, USNRC, Region III
Project Manager, Prairie Island Nuclear Generating Plant, USNRC, NRR
NRC Senior Resident Inspector – Prairie Island Nuclear Generating Plant

Attachment

A095

Attachment 1

Prairie Island Nuclear Generating Plant

60-Day Response to

NRC Bulletin 2002-01

4 Pages Follow

Requested Item 3.A

3. Within 60 days of the date of this bulletin, all PWR addressees are required to submit to the NRC the following information related to the remainder of the reactor coolant pressure boundary:

   A. the basis for concluding that your boric acid inspection program is providing reasonable assurance of compliance with the applicable regulatory requirements discussed in Generic Letter 88-05 and this bulletin. If a documented basis does not exist, provide your plans, if any, for a review of your programs.

Prairie Island Response

The Electrical Power Research Institute (EPRI) Pressurized Water Reactor (PWR) Materials Reliability Program (MRP) has provided an outline for utilities to use in assessing their individual boric acid inspection program. Our response includes the following items:

1. Program Definition and Responsibility

Nuclear Management Company, LLC (NMC) implements procedures and programs to manage corrosion of carbon steel and low-alloy steel components by leaking borated water. Essential elements of the boric acid inspection program include: scope of inspections, frequency of inspections, documentation of leakage, and evaluation of any leakage indications. General requirements are provided to comply with American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI and Technical Specifications. Leakage reduction activities minimize leakage of reactor coolant.

Responsibilities for essential aspects of the boric acid inspection program are defined. Engineering is responsible for evaluating the acceptability of a component should degradation occur and for determining whether the item may be returned to service or if maintenance or repair is required. Engineering is responsible for scheduling and performing ASME B&PV Code, Section XI examinations to detect of boric acid accumulation and evidence of leakage. Operations is responsible for leakage monitoring and trending. Maintenance is responsible for correcting or repairing a component.

2. Inspection Scope and Frequency

Leakage is monitored when the plant is at power and when it is shutdown. During normal plant operation, leakage is monitored in accordance with Technical Specification surveillance requirements. Containment airborne activity and humidity are monitored to detect leakage. During plant shutdown for refueling, inspections are performed per ASME B&PV Code, Section XI on the Class 1 pressure boundary to locate leakage and evaluate boric acid accumulation and corrosion.

Visual inspections for leakage or evidence of leakage affecting carbon steel and low-alloy steel components are conducted every refueling outage and during plant startup. Additionally, containment entries are made at regular intervals during plant operation.

3. Obstructions to Visual Inspections

Visual examinations may be scheduled based on expected plant conditions in order to reduce dose and provide a safe working environment. Plant procedures and programs specify the test conditions, which include pressure, temperature and insulation removal requirements. Insulation removal requirements are based on ASME B&PV Code, Section XI, paragraph IWA-5242.

For pressure retaining bolted connections, procedures and practices used to implement the boric acid inspection program coordinate inspections and direct when insulation must be removed to perform the examinations.

For all other components, including piping and pressure vessel shells, visual examination (VT-2) may be conducted without the removal of insulation by examining the accessible and exposed surfaces and joints of the insulation. Vertical surfaces of insulation need only be examined at the lowest elevation where leakage may be detectable per ASME B&PV Code, Section XI. Horizontal surfaces of insulation are examined at each insulation joint. For the carbon steel pressure vessels, portions of the shell are periodically exposed when performing scheduled ASME B&PV Code, Section XI examinations. This permits any evidence of boric acid accumulation, leakage, or damage to be discovered, and additional actions to be defined as necessary.

In addition, ASME B&PV Code, Section XI, requires the examination of areas surrounding insulated components, including floor areas or equipment surfaces located underneath the components, for evidence of leakage, or other areas to which such leakage may be channeled.

Insulation is removed as needed when carbon steel and low alloy steel components are exposed to borated water, or when industry events warrant further investigation.

4. Training

Personnel that perform, evaluate, and accept code examinations for the boric acid inspection program are certified in VT-1, VT-2, or VT-3 examination methods per the requirements of ASME B&PV Code, Section XI. In addition, other site personnel (engineers, operators, mechanics, etc), not necessarily certified to code requirements are expected to initiate corrective actions according to plant administrative procedures upon discovery of system and component leakage during routine activities.

Applicable industry operating experience is routed to engineering personnel for assessment. The training program is enhanced by incorporating industry recommended practices.

5. Response to Leakage:

A multifaceted approach is used for the prevention of boric acid accumulation and corrosion of carbon steel and low-alloy steel components. Core elements include leakage prevention, leakage detection and trending, visual inspections, evaluation and repair.

Leakage from the Reactor Coolant System (RCS) is maintained as low as reasonably possible. Review of recent plant records shows that Prairie Island operates with low unidentified RCS leakage. Through-wall leakage of the reactor coolant pressure boundary, excluding steam generator tubing, is not permitted per Technical Specifications. Once through wall leakage is identified it must be corrected.

Unidentified RCS leakage is maintained less than 1 gpm by Technical Specifications. Leak rate calculations, monitoring, and trending are performed to identify increases in RCS leakage. When a significant increase in RCS leakage is detected during normal operations, NMC implements administrative controls and investigates the source of leakage. The investigation may involve performing appropriate chemistry sampling and radiation monitoring, additional trending, conducting leak rate calculations at an increased frequency, and attempting to locate the source of RCS leakage.

When evidence of RCS leakage is discovered, such as boric acid accumulation, the practice is to identify the source of leakage, perform an evaluation to determine an appropriate disposition (e.g., repair, replace, engineering analysis, monitor, etc.), and clean up any remaining boric acid deposits. All boric acid accumulation discovered under the boric acid inspection program is categorized in accordance with ASME B&PV Code, Section XI, subparagraph IWA-5250(b).

If leakage occurs at a pressure retaining bolted connection, the first objective is to repair the component. In accordance with subparagraph IWA-5250(a)(2), bolting is removed and a VT-3 visual exam for corrosion shall be performed and evaluated in accordance with ASME B&PV Code, paragraph IWA-3100. Any repair or replacement of a component shall satisfy ASME B&PV Code, Section XI, Article IWA-4000 or IWA-7000, as applicable.

6. Review of Program Effectiveness

The Nuclear Oversight Department performs periodic reviews of the procedures and activities used to implement the boric acid inspection program.

When instances of boric acid accumulation or leakage are encountered under the boric acid inspection program, the recommended corrective actions receive oversight through the work order, in-service inspection, post refueling outage startup checklist, and corrective action processes. The review process includes review of indications recorded, corrective actions initiated, and status of corrective actions.

Any degraded condition in excess of ASME B&PV Code, Section XI limits requires that an engineering analysis be performed. If a degraded condition is not corrected and dispositioned to use-as-is, then an independent review and evaluation is performed prior to returning the component to service. This process ensures appropriate management involvement and oversight.

Industry experience is reviewed in accordance with the Industry Operating Experience Review Program and incorporated into the boric acid inspection program and procedures as necessary.

NMC's evaluation, as indicated herein, supports the conclusion that there is reasonable assurance of compliance with the applicable regulatory requirements discussed in Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants," and NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity" for Prairie Island.