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Bulletin 2003-02

U S Nuclear Regulatory Commission
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Washington, DC 20555-0001

Prairie Island Nuclear Generating Plant Unit 1
Docket 50-282
License No. DPR-42

60-Day Report Pursuant to NRC Bulletin 2003-02 for 2004 Prairie Island Unit 1 Lower Head Penetration Inspection

By letter dated August 21, 2003, the Nuclear Regulatory Commission (NRC) issued Bulletin (BL) 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity." By letter dated September 19, 2003, Nuclear Management Company, LLC, (NMC) responded to the BL and committed to perform a 100% bare-metal visual exam of the lower reactor pressure vessel dome up to and including each bottom-mounted instrumentation (BMI) penetration to reactor pressure vessel (RPV) junction during each refueling outage.

The BL required an inspection summary within 60 days of plant restart following the next inspection of the RPV lower head penetrations. In response to these requirements, NMC notes the following with respect to the lower RPV dome inspection conducted during the past Prairie Island Unit 1 refueling outage:

Summary of Inspections Performed

No indications were observed that were similar to the South Texas Project Unit #1 deposits. In addition, no indications were observed that were similar to any of those depicted in Electric Power Research Institute (EPRI) technical guidance for inspecting the vessel head. The examiners determined that the minor indications that were found were not characteristic of reactor coolant leakage from the tube/vessel interface. All penetrations with unusual indications (described below) are directly attributable to past leakage from the refueling cavity or to condensation from above. The results of radiochemical and chemical analysis of samples obtained from the dried liquid streaks on the bottom of the vessel and the minor deposits on several penetrations indicate that these accumulations are not consistent with dried reactor coolant.

Method and Extent of Inspection

The RPV bottom head at Prairie Island contains 36 BMI nozzles. Closely conforming mirror insulation constructed in bolted together panels covers the bottom head with approximately six inches of clearance between the bottom head and the insulation. At the very bottom of the vessel, a five-foot diameter circular section of mirror insulation was unbolted and dropped down approximately two feet. The 12 center BMI tubes penetrate this circular section of insulation so that it could not be removed, just slid down the tubes. With this panel lowered the 12 center tubes were exposed for direct visual inspection and were also inspected using a hand held video probe. The remaining 24 tubes penetrate the angled insulation sections adjacent to the circular section. A gap of approximately three inches exists between these insulation panels and the bottom of the vessel. These 24 tubes were visually inspected using the video probe manually manipulated underneath the insulation panels to obtain a full 360-degree view of the joint between each nozzle and the RPV bottom head.

Qualified VT-2 inspectors visually inspected all 36 penetrations using a video probe and a remote video monitor. Reference markers with the penetration number stamped on them were inserted through the insulation at each nozzle. Using this method, the inspectors were able to ensure that each penetration was inspected and that the visual inspection covered 360 degrees around each penetration. 100% coverage of the bare metal of the bottom head up to the outermost penetrations was also achieved; most of the bare surface was visible without using the video probe; surfaces at the outermost penetrations were inspected using the video probe.

As-Found Condition of Prairie Island Unit 1 Lower Head

The general condition of the bottom of the vessel was good. The vessel is painted with gray carbozinc paint that has preserved the surface so that there is no surface rust. Many dried liquid streaks with a white powdery consistency were observed. These streaks emanated from above the BMI penetrations and ran down to the bottom of the vessel where they collected. The dried streaks are believed to have been the result of previous cavity seal leakage events. Prairie Island has had cavity seal leakage problems in the past prior to using the new "segmented seal" which has been used for several recent outages.

The dried liquid streaks impinged on most of the BMI penetrations and left traces of white material in the crevice between the nozzle and the vessel on several. Most of these deposits had no "volume" and therefore do not require further disposition since any leak from a vessel head penetration will have some "volume" to it as described and depicted in EPRI TR-1006899 and as shown in the South Texas BMI leakage photos that were included in the Inspection Work Order package. Only three of the penetrations were reported to have deposits with some amount of "volume" to them.

The three penetrations that were reported to have "volume" were penetrations 9, 18 and 35. The video probe provided a magnified image of these deposits, which exaggerated the amount of material present. Subsequent review of the videotape of these

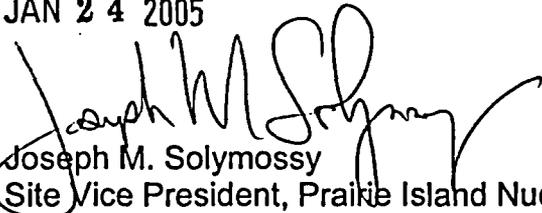
penetrations showed that the deposits had a hollow look to them and it could be seen that the annulus between the tube and the vessel below the deposits was open indicating that the deposit did not emanate from the annulus. Any leak from the nozzle/vessel interface would emanate from the annulus area. In addition, results of radiochemical and chemical analysis of samples obtained from the Penetrations 9, 18 and 35, indicate that the small accumulations seen on these penetrations are not consistent with dry reactor coolant.

Based on the visual evidence and chemical analysis, the examiners determined that the minor indications that were found were not characteristic of reactor coolant leakage from the tube/vessel interface annuli. All penetrations with unusual indications (described above) are attributable to past leakage from the refueling cavity or condensation from above.

Summary of Commitments

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

I declare under penalty of perjury that the foregoing is true and correct. Executed on
JAN 24 2005



Joseph M. Solymosy
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Nuclear Management Company, LLC

cc: Administrator, Region III, USNRC
Project Manager, Prairie Island, USNRC
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