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Prairie Island Nuclear Generating Plant Unit 2
Docket 50-306
License No. DPR-60

Amendment to Unit 2 Inservice Inspection Summary Report, Interval 4, Period 1, Outage 2, Refueling Outage Dates: 11-15-2006 to 12-15-2006, Fuel Cycle 23: 06-11-2005 to 12-15-2006

Reference: 1) Letter from Nuclear Management Company, LLC (NMC) to NRC, "Unit 2 Inservice Inspection Summary Report, Interval 4, Period 1, Outage 2, Refueling Outage Dates: 11-15-2006 to 12-15-2006, Fuel Cycle 23: 06-11-2005 to 12-15-2006," dated March 14, 2007 (ADAMS Accession Number ML070780140).

In Reference 1, NMC submitted the Inservice Inspection Summary Report associated with Prairie Island Nuclear Generating Plant Unit 2 refueling outage 2R24. Northern States Power, a Minnesota corporation (NSPM) has subsequently determined that an amendment to Reference 1 is required to add a discussion regarding containment inaccessible areas as required by 10 CFR 50.55a. The amendment is included herein as Enclosure 1.

Summary of Commitments

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

Michael D. Wadley

Michael D. Wadley
Site Vice President, Prairie Island Nuclear Generating Plant Units 1 and 2
Northern States Power Company - Minnesota

1717 Wakonade Drive East • Welch, Minnesota 55089-9642
Telephone: 651.388.1121

Enclosure

cc: Administrator, Region III, USNRC
Project Manager, Prairie Island, USNRC
Resident Inspector, Prairie Island, USNRC
Chief Boiler Inspector, State of Minnesota

ENCLOSURE 1

AMENDMENT TO INSPECTION SUMMARY REPORT
INTERVAL 4, PERIOD 1, OUTAGE 2
REFUELING OUTAGE DATES: 11-15-2006 TO 12-15-2006
UNIT 2, FUEL CYCLE 23: 06-11-2005 TO 12-15-2006

5 pages follow

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PRAIRIE ISLAND NUCLEAR GENERATING PLANT
1717 WAKONADE DRIVE EAST
WELCH, MINNESOTA 55089

AMENDMENT TO INSPECTION SUMMARY REPORT
INTERVAL 4, PERIOD 1, OUTAGE 2
REFUELING OUTAGE DATES: 11-15-2006 TO 12-15-2006
UNIT 2, FUEL CYCLE 23: 06-11-2005 TO 12-15-2006

Prepared by: Tom Downing Date: 9/16/2008

ISI Program Engineer, Prairie Island

Tom Downing

Reviewed by: Date: 9/24/2008

Program Engineering Supervisor, Prairie Island

Robert Murray

Reviewed by: Date: 9/24/2008

Program Engineering Manager, Prairie Island

Steve Skoyen

Approved by: M. Schimmel Date: 9.27.08

Director of Engineering, Prairie Island

Mark Schimmel

The following is an amendment to the 2R24 90 Day ISI Summary Report (Prairie Island letter number L-PI-07-023). The purpose of this amendment is to add a discussion regarding containment inaccessible areas as required by the Code of Federal Regulations 10CFR50.55a.

The Code of Federal Regulations, Title 10, Part 50.55a(b)(2)(ix)(A) states: "For Class MC applications, the licensee shall evaluate the acceptability of inaccessible areas when conditions exist in accessible areas that could indicate the presence of or result in degradation to such inaccessible areas. For each inaccessible area identified, the licensee shall provide the following in the ISI Summary Report as required by IWA-6000: (1) A description of the type and estimated extent of degradation, and the conditions that led to the degradation; (2) An evaluation of each area, and the result of the evaluation, and; (3) A description of necessary corrective actions."

The 2R24 refuel cavity leakage which resulted in water leaking from behind the concrete in containment sump B indicated that borated refuel water had come in contact with inaccessible areas of the steel containment vessel. This leakage is considered a condition in an accessible area that could indicate the presence of or result in degradation of inaccessible areas. As such, the following evaluation is amended to the 2R24 90 Day ISI Report as required by 10CFR50.55a(b)(2)(ix)(A).

1. A description of the type and estimated extent of degradation, and the conditions that led to the degradation.

The site believes there has been no significant degradation of the steel containment vessel, the containment concrete, or steel concrete reinforcing bar. In December of 1998 Automated Engineering Services Corp (AES) performed an evaluation titled "Evaluation of the Effects of Borated Water Leaks on Concrete, Reinforcing Bars, and Carbon Steel Plate of the Containment Vessel". The evaluation concluded that the effect of borated water leaks on the structural materials in containment (concrete, reinforcing bars, and containment shell plate material) is in the worst case minimal and does not affect the capability of the structure to perform its intended function. In addition to the evaluation, a section of concrete was removed from sump B in 1998 to allow direct examination of the steel containment vessel. This examination showed no indicaiton of corrosion or pitting. The 1998 evaluation was reviewed by AES in 2R24 to account for leakage experienced from 1998 to the fall of 2006. This review determined that "The basis and conclusions developed in the Reference 1 report are still valid and in my opinion the integrity of the structural components (concrete, rebar and containment shell) are not compromised." Based on the results of the 1998 and 2006 professional engineering studies indicating no detrimental affects of refuel cavity leakage on containment over an extended period of time, there is reasonable assurance of no significant degradation.

The condition that could indicate the presence of or result in degradation is refuel cavity leakage that has come in contact with the containment vessel. Refuel cavity leakage into unit 2 sump B was noted on 11/23/06 (AR01063531). Inspection of the sump showed that leakage was coming into the sump through the concrete at the containment vessel both sides of the RH suction lines at a rate of approximately 1 gph. Leakage

remained fairly constant during the duration of the refuel cavity flood. On 11/29/06 other areas of containment were inspected to determine if other leakage was evident (AR01064513). The areas inspected included sump B, the containment perimeter at the 695' level, regen HX room, SE corner of containment N side of the transfer canal, SE corner of containment S side of the transfer canal, and the floor of the annulus with particular attention to the areas where the transfer tube penetrates containment and the shield building. These areas were chosen as the most likely to show leakage based on past experience and proximity to the refuel cavity. No other leakage was noted as a result of these inspections. Similar leakage has been experienced in previous outages on both units with documentation dating back to at least 1998. In addition to sump B, past outages have shown leakage at other locations such as the regen HX room, nuclear instrument electrical penetrations and the floor near the RC drain tank. Leakage had been mitigated in recent unit 1 and unit 2 outages through caulking of the refuel cavity penetrations.

2. An evaluation of the area, and the result of the evaluation.

In December of 1998 Automated Engineering Services Corp (AES) performed an evaluation titled "Evaluation of the Effects of Borated Water Leaks on Concrete, Reinforcing Bars, and Carbon Steel Plate of the Containment Vessel". Following are pertinent excerpts from that evaluation.

EFFECT OF BORATED WATER LEAKS ON CONCRETE

Many studies have been conducted on the effect of acid rain on concrete. Laboratory studies have been conducted [Ref. 1,2] utilizing accelerated test program for effects of sulfuric acid solutions with pH ranging from 2 to 5 for periods ranging from 30 days to 100 days. Concrete samples with strengths varying from 3000 psi to 9000 psi were studied. The studies revealed the surface deterioration of the concrete increased as the strengths increased due to the higher cement content in stronger concrete samples. It also increased with increasing acidity of the solution.

However the corrosive effect of borated water (boric acid) is less than that of sulfuric acid at the same acidity levels. Reference 3 shows that boric acid has negligible effect on concrete whereas the same reference indicates that sulfuric acid will rapidly disintegrate concrete. Discussions with Portland Cement Association (Mr. Robert Shuldes) confirmed that the effect of borated water will have negligible effects on concrete especially since the surface is wetted only for a short time duration (about 15 days every outage). The lack of deterioration of the concrete surfaces where white deposits were seen further reinforces the observation that borated water does not have any appreciable effect on concrete.

Based on the above, we can safely conclude that the internal concrete surfaces at the construction joints and in the flow paths of the leaks would not have any deterioration. There is no safety significance of the borated water leaks on the concrete surfaces since the concrete structure would

not have deteroriated and should be capable of performing its intended funciton.

EFFECT OF BORATED WATER LEAKS ON REINFORCING BARS

Since the borated water does not affect the concrete surface, the reinforcing bars would be fully protected inside the concrete. Note that the chloride content of the leaking water is small and will have no effect on the reinforcing bars. Also there is no evidence that the concrete surfaces have cracked thereby providing a path to the seepage of acidic water directly to the reinforcing bars. The likelyhood of any corrosion of the reinforcing bars in this situation is very remote.

Based on this observation, there is no reason to suspect the corrosion of the reinforcing bars. Therefore, the strength of the reinforced concrete material is not compromised by the borated water leaks.

EFFECT OF BORATED WATER LEAKS ON THE CONTAINMENT SHELL PLATE MATERIAL

It is known in the nuclear industry that borated water in the form of boric acid can be corrosive to components fabricated from carbon and low alloy steels [Ref. 4]. However, most of the studies conducted involved reactor coolant at high concentration (13,000-15,000 PPM of boron with small amounts of lithium) and at high temperatures (>200°F). Reference 4 concludes that the maximum corrosion rates occurred where moisture can be replenished by a flowing solution, keeping a wet/dry interface between the solution and the dry boric acid crystals. It was also seen that when the boric acid dries out and is not significantly re-wetted, the corrosion levels are much lower.

As a precaution, NSP removed a portion of the grout material adhering to the steel plate around the pipe sleeve in the Sump B. The exposed steel surface did not show any signs of corrosion or surface pitting. This provides strong evidence that the boric acid solution was weak enough and was not constantly wetted for a long enough period of time to cause any deterioration of the steel plate surface. The same argument can be extended to other plate surfaces which are not exposed and which may be in the leak paths.

Based on the above, it is believed that the containment shell is not affected by the observed leaks and has the capability to perform its intended fuction.

The evaluation quoted above was reviewed by Automated Engineering Services Corp in December of 2006 in response to the leakage observed in 2R24. The review determined that the basis and conclusions developed in the earlier report were still valid

and the integrity of the structural components (concrete, rebar and containment shell) were not compromised.

3. A description of necessary corrective actions.

Actions have been taken to prevent future leakage including caulking refuel cavity leakage points prior to pool flood under maintenance procedure D99. In addition, a section of concrete will be removed from sump B in the fall 2008 2R25 outage (WO00327768) to allow direct visual inspeciton of the steel containment vessel to assure no significant degradation. It is believed the sump B location would be the most susceptible to corrosion as it has the most frequent history of wetting and is in close proximity to the concrete surface allowing greater oxygen exposure. A lack of significant corrosion in sump B will provide a high level of confidence there is no significant corrosion in other areas of the containment vessel.

In summary, the site has a high level of confidence there is no significant degradation of the containment vessel or associated structures based on evaluation and previous inspection. The site has taken corrective actions to prevent future leakage and the concrete will be removed from sump B in the 2R25 outage to allow direct inspection of the containment vessel to assure no significnat degradation.