

January 27, 2009

EA-08-272

Mr. Michael D. Wadley  
Site Vice President  
Prairie Island Nuclear Generating Plant  
Northern States Power Company-Minnesota  
1717 Wakonade Drive East  
Welch, MN 55089

SUBJECT: FINAL SIGNIFICANCE DETERMINATION FOR A WHITE FINDING AND  
NOTICE OF VIOLATION; NRC INSPECTION REPORT NO. 05000282/2008008;  
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 1

Dear Mr. Wadley:

The purpose of this letter is to provide you the final results of our significance determination of the preliminary White finding identified in the subject inspection report. The inspection finding was assessed using the Significance Determination Process and was preliminarily characterized as White, a finding with low to moderate increased importance to safety that may require additional U.S. Nuclear Regulatory Commission (NRC) inspections. This White finding is associated with your staff's failure to adequately control the position of a normally open valve used to isolate the 11 turbine-driven auxiliary feedwater pump's (TDAFWP) discharge pressure switch. The valve was left closed, causing the 11 TDAFWP to fail to operate as required subsequent to a Unit 1 reactor trip which occurred on July 31, 2008. The pump was rendered inoperable for a time period that significantly exceeded the 72 hour time limit allowed by the Technical Specifications.

In a letter dated December 5, 2008, your staff provided information stating your staff's position on this issue. Your staff acknowledged the violation, described the issue, the root cause, the corrective actions taken, and your assessment of the risk significance. Your staff performed a human reliability analysis for operator recovery of 11 TDAFWP discharge pressure trip remotely from control room and locally after the control room is abandoned. The analysis included detailed modeling and assessment of risk contribution from a postulated fire and concluded that the issue was of very low risk significance.

After considering the information developed during the inspection and the additional information you provided in your letter dated December 5, 2008, the NRC has concluded that the inspection finding is appropriately characterized as White, a finding with low to moderate increased importance to safety that may require additional NRC inspections. Enclosure 1 to the letter provides a detailed description of the NRC final risk significance determination with the issue.

You have 30 calendar days from the date of this letter to appeal the staff's determination of significance for the identified White finding. Such appeals will be considered to have merit only if they meet the criteria given in the NRC Inspection Manual Chapter 0609, Attachment 2.

The NRC has also determined that the Unit 1 TDAFWP inoperability is a violation of Technical Specification 3.7.5, as cited in the enclosed Notice of Violation (Notice). The circumstances surrounding the violation are described in detail in the subject inspection report. In accordance with the NRC Enforcement Policy, the Notice is considered escalated enforcement action because it is associated with a White finding.

The NRC has concluded that the information regarding the reason for the violation, the corrective actions taken, and the date when full compliance was achieved is already adequately addressed on the docket in the subject inspection report and your letter dated December 5, 2008. Therefore, you are not required to respond to this letter unless the description therein does not accurately reflect your corrective actions or your position.

Because plant performance for this issue has been determined to be in the regulatory response band, we will use the NRC Action Matrix to determine the most appropriate NRC response for this event. We will notify you, by separate correspondence, of that determination.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response, if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/readingrm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction.

Sincerely,  
*/RA/*

James L. Caldwell  
Regional Administrator

Docket No. 50-282  
License No. DPR-42

Enclosures:

1. Final Significance Determination
2. Notice of Violation

cc w/encl: D. Koehl, Chief Nuclear Officer  
Regulatory Affairs Manager  
P. Glass, Assistant General Counsel  
Nuclear Asset Manager  
J. Stine, State Liaison Officer, Minnesota Department of Health  
Tribal Council, Prairie Island Indian Community  
Administrator, Goodhue County Courthouse  
Commissioner, Minnesota Department of Commerce  
Manager, Environmental Protection Division  
Office of the Attorney General of Minnesota  
Emergency Preparedness Coordinator, Dakota  
County Law Enforcement Center

The NRC has also determined that the Unit 1 TDAFWP inoperability is a violation of Technical Specification 3.7.5, as cited in the enclosed Notice of Violation (Notice). The circumstances surrounding the violation are described in detail in the subject inspection report. In accordance with the NRC Enforcement Policy, the Notice is considered escalated enforcement action because it is associated with a White finding.

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Sincerely,  
**/RA/**  
 James L. Caldwell  
 Regional Administrator

Docket No. 50-282  
 License No. DPR-42  
 Enclosures: 1. Final Significance Determination  
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cc w/encl: D. Koehl, Chief Nuclear Officer  
 Regulatory Affairs Manager  
 P. Glass, Assistant General Counsel  
 Nuclear Asset Manager  
 J. Stine, State Liaison Officer, Minnesota Department of Health  
 Tribal Council, Prairie Island Indian Community  
 Administrator, Goodhue County Courthouse  
 Commissioner, Minnesota Department of Commerce  
 Manager, Environmental Protection Division  
 Office of the Attorney General of Minnesota  
 Emergency Preparedness Coordinator, Dakota  
 County Law Enforcement Center

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DATE	01/22/09	01/22/09	01/22/09	01/23/09	01/21/09	01/21/09	01/23/09	01/26/09

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1 OE concurrence received via e-mail from G. Bowman on January 21, 2009.

2 NRR concurrence received via e-mail from G. Bowman on January 21, 2009.

Letter to Michael D. Wadley from James L. Caldwell dated January 27, 2009

SUBJECT: FINAL SIGNIFICANCE DETERMINATION FOR A WHITE FINDING AND NOTICE OF VIOLATION; NRC INSPECTION REPORT NO. 05000282/2008008; PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 1

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## FINAL SIGNIFICANCE DETERMINATION

In NRC Inspection Report No. 05000282/2008008; 05000306/2008008, an apparent violation of Technical Specification (TS) 3.7.5 was identified associated with the inoperability of the 11 turbine-driven auxiliary feedwater pump (TDAFWP) for approximately 138 days, a time period which significantly exceeded the 72 hour time limit allowed by the TS. Based upon the NRC's consideration of information provided by the licensee in a letter dated December 5, 2008, the NRC has determined that the preliminary finding is appropriately characterized as White, a finding with low to moderate increased importance to safety that may require additional NRC inspections.

### **Apparent Violation: (AV) 05000282/2008001-01**

### **Final Significance: White**

The NRC reviewed the information provided in the letter dated December 5, 2008, and concluded that it was generally acceptable for use in the final significance determination with several exceptions as detailed below.

With respect to the analysis of control room fires that could result in control room abandonment, the NRC disagreed with the results of the licensee's evaluation of the time available for fire suppression activities before intolerable environmental conditions would develop. Specifically, the NRC found that the licensee's estimate relied on the assumption that the control room ventilation system would continue to operate during a fire. The NRC's review of the control room ventilation system operation and fire response procedures indicated that the system may isolate during a fire or that operators may secure the system as directed by procedures. Additionally, the licensee did not consider the potential for smoke to obscure the operators' vision during a control room fire. As a result, the NRC concluded that the time available for fire suppression could be shorter than 25 minutes and used a best estimate of 15 minutes in the final Significance Determination Process (SDP) evaluation. The NRC also disagreed with the licensee's consideration of both "prompt suppression" of a fire by the control room operators and suppression by the fire brigade. The guidance of NUREG/CR-6850 indicates that "prompt suppression" should only be considered for hot work fire scenarios where a fire watch is present.

Regarding the analysis of main control board fires that affect redundant trains of equipment and require control room abandonment, the NRC found that the licensee did not consider a fire affecting the Unit 2 main control board. The NRC determined that Procedure F5, Appendix B, "Control Room Evacuation (Fire)," would require control room abandonment for both units if either main control board was significantly affected by a fire. As a result, the NRC determined that the fire frequency for this scenario should have been multiplied by two to reflect a fire in either unit's main control board.

The relay room fire analysis assumed that the Unit 2 motor driven auxiliary feedwater (AFW) pump could be cross-tied to provide for decay heat removal. The NRC determined that the licensee's control room evacuation procedure did not specify the use of the cross-tie and that

other operating procedures would have to be modified to use the cross-tie. Additionally, the licensee's operations training program specifies the use of Procedure F5 for control room abandonment situations rather than emergency or other operating procedures. The NRC concluded that the successful use of the AFW cross-tie was unlikely and should not be credited in the final significance determination.

Consistent with the NRC's preliminary SDP evaluation, the licensee's analysis considered the possibility of recovering the 11 TDAFWP. The NRC agreed that the estimate of the time available to recover the pump was reasonable. However, the NRC found the timeline for the operator actions for recovery in control room abandonment scenarios to be overly optimistic. As an example, the licensee did not consider the time impact of required actions, such as announcements and notifications to personnel, on the control room abandonment which would cause delays in arriving at the Hot Shutdown Panel. Also, the timeline was largely based on existing estimates of individual tasks, rather than a walk-through demonstration of the current procedure. The NRC concluded that individual task time estimates may not adequately capture the overall timeline of the coordinated crew response required in a control room abandonment fire scenario. Because of concerns with the timing analysis, the NRC determined that it was not appropriate to consider that the operator had "extra" time available for recovery. In the final significance determination, the NRC used a modified version of the licensee's human error probability (HEP) by using the estimated HEP without recovery.

The NRC developed several other concerns with the risk analysis but did not consider the quantitative impacts on the risk estimate due to the complexity involved and the low likelihood that rigorous evaluation would cause the risk of the finding to be greater than low to moderate safety significance. The NRC noted that the licensee's evaluation credited the automatic fire suppression system in the relay room fire analysis without evaluating whether the system would actuate for those specific scenarios. In three scenarios, the time to target damage was estimated at 6 minutes or less. The assumption that the system would automatically actuate in these scenarios may not be appropriate given the short time to target damage.

The NRC also noted that the licensee did not consider any dependency between the failure of the automatic suppression system and the failure of manual fire suppression which could be particularly important in the short time to damage fire scenarios. Lastly, the horizontal flame spread rate used in the analysis to determine the times to target damage was not adequately justified.

In summary, the NRC considered the licensee's information in the final significance determination with the exceptions noted above, where modified inputs were used in the quantitative analysis. The NRC analysis using the licensee's information, with the modifications described above, resulted in a change in core damage frequency of approximately  $2E-6$ /yr. The dominant core damage sequence was a control room fire which results in abandonment of the control room, followed by the failure of the 11 TDAFWP, and a failure of the operator to recover the pump. The dominant sequence was consistent with both the NRC's preliminary significance determination and with the licensee's risk evaluation.

## NOTICE OF VIOLATION

Northern States Power Company - Minnesota  
Prairie Island Nuclear Generating Plant, Unit 1

Docket No. 50-282  
License No. DPR-42  
EA-08-272

During an NRC inspection conducted from August 4 through October 6, 2008, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Technical Specification 3.7.5 requires, in part, that two auxiliary feedwater trains be operable during plant operation in Modes 1, 2, and 3.

Technical Specification 3.7.5.B requires, in part, that if one auxiliary feedwater train is inoperable in Modes 1, 2, and 3, the affected train shall be restored to operable status within 72 hours or the plant placed in Mode 3 within 6 hours and Mode 4 within 12 hours.

Contrary to the above, from March 15, 2008 to July 31, 2008, the 11 turbine-driven auxiliary feedwater pump was inoperable for a period of greater than 72 hours and the licensee did not restore the pump to operable status or place the plant into Mode 3 or Mode 4 within the required time periods. Specifically, the pump was inoperable for approximately 138 days due to the discharge low pressure switch being isolated and no actions were taken to restore the pump to operable status or to place the plant in Mode 3 or 4.

This violation is associated with a White Significance Determination Process finding.

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance was achieved, is already adequately addressed on the docket in Inspection Report No. 05000282/2008008, and your letter dated December 5, 2008. However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation," EA-08-272, and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region III, and a copy to the NRC Resident Inspector at the Prairie Island Nuclear Generating Plant, within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Enclosure 2

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 27<sup>th</sup> day of January 2009