

Prairie Island 2

2Q/2006 Plant Inspection Findings

Initiating Events

G**Significance:** Mar 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

EVALUATION OF EXPIRED SEALANT PERFORMANCE FOR FLOOD PROTECTIONInspection Report# : [2006002\(pdf\)](#)Inspection Report# : [2006003\(pdf\)](#)

Mitigating Systems

G**Significance:** Mar 24, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Consider Adverse Ampacity Effects of High Temperature Conditions in the Auxiliary Feedwater Pump Rooms

A Non-Cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," having very low safety significance was identified by the inspectors. Specifically, the licensee had not evaluated and updated the associated plant cable ampacity calculation to determine the potential consequences of adverse effects to cabling due to higher temperatures in the auxiliary feedwater (AFW) pump rooms and other auxiliary building areas. After identification by the inspectors, the licensee was able to demonstrate that even though the higher temperatures decreased the ampacity margins for the affected cabling, it did not decrease the margins to the limit where the cabling would fail if called upon to provide power to equipment important to safety.

The finding was more than minor because it affected the mitigating system cornerstone objective to ensure the availability, reliability, and capability of systems that mitigate transients and accidents, and if left uncorrected, the finding could become a more significant safety concern. Specifically, if left uncorrected, the licensee may not account for high temperature conditions in plant areas that could adversely affect the ampacity of cabling that supply power to equipment important to safety. This finding was of very low safety significance because, the licensee's preliminary evaluation determined that the higher temperatures in the AFW pump rooms and other auxiliary building areas would not prevent equipment important to safety from functioning.

Inspection Report# : [2006006\(pdf\)](#)G**Significance:** Nov 23, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

Configuration Control Event Causes a Loss Fire Suppression to the Relay Room

The carbon dioxide suppression system isolation valve for the relay room had been mis-positioned in the closed position rendering the suppression system non-functional. This finding was related to the Personnel subcategory of the cross-cutting area of Human Performance. Operators failed to open the valve following a maintenance activity. Operators failed to identify that the valve was mis-positioned in the closed position during two subsequent valve position surveillance activities.

Inspection Report# : [2005012\(pdf\)](#)G**Significance:** Sep 30, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO MONITOR COOLING WATER PUMP DISCHARGE PIPING WALL THICKNESS

A finding of very low safety significance was identified by the inspectors for a violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control." The licensee failed to implement nondestructive examinations on the discharge piping of the safety-related cooling water pumps to verify that the pipe wall had not been reduced below minimum design thickness.

This finding was more than minor because failure to monitor cooling water minimum pipe wall thickness could result in cooling water leakage or pipe rupture due to active corrosion and/or erosion processes present in the cooling water system. The finding was of very low safety significance

because the licensee concluded that the piping systems were currently operable based on the absence of through-wall leakage and based upon the surface appearance of internal piping sections photographed during periodic pump discharge valve maintenance.

Inspection Report# : [2005008\(pdf\)](#)

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Significance: Sep 30, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

INADEQUATE DESIGN CONTROL FOR THE 22 COMPONENT COOLING WATER HEAT EXCHANGER DIVIDER PLATE MODIFICATIONS

A finding of very low safety significance was identified by the inspectors for a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control." The licensee failed to implement appropriate configuration and design controls associated with modifications made to the number 22 component cooling water (CC) heat exchanger (HX) divider plate. Specifically, the licensee failed to verify input of a key input assumption, apply appropriate acceptance criteria, and update drawings with the replacement divider plate material installed. As corrective actions, the licensee revised related modifications and calculations, and intends to examine CC HX welds during the next internal HX inspection.

This finding was more than minor because the number 22 CC HX divider plate was modified, returned to service, and operated outside design allowable limits due to excessive differential pressure. Sustained operation outside design allowable limits could have resulted in divider plate failure and loss of heat exchanger function. The finding was of very low safety significance because it was a design issue which did not result in loss of function per Generic Letter 91-18.

Inspection Report# : [2005008\(pdf\)](#)

G

Significance: Sep 30, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO MONITOR LOSS OF MAKEUP RESERVE VOLUME AVAILABLE IN INTAKE CANAL

A finding of very low safety significance was identified by the inspectors for a violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control." The licensee failed to establish a test program to ensure that the design basis reserve makeup volume of cooling water for the ultimate heat sink contained in the intake canal was maintained. Specifically, the loss of reserve volume available in the intake canal due to accumulation/buildup of sediment was not being tracked or evaluated.

This finding was more than minor because failure to monitor the loss of reserve volume available in the intake canal due to accumulation/buildup of sediment could have resulted in an inadequate cooling water reserve volume to support a plant shutdown and cooldown following a loss of Lock and Dam No. 3. The finding was of very low safety significance because the licensee demonstrated that adequate reserve volume existed in the intake canal to support the 4-hour reserve volume described in the Updated Safety Analysis Report.

Inspection Report# : [2005008\(pdf\)](#)

G

Significance: Jul 01, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

FAILED TO UPDATE PRESSURE DROP CALCULATION FOR REPLACEMENT STEAM GENERATORS

A finding of very low safety significance was identified by the inspectors for a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requirements. The licensee failed to recognize an increased pressure drop in the hydraulic characteristics between the new replacement steam generators (RSGs) and associated main steam safety valves. Specifically, Calculation ENG-ME-454, "Pressure Drop Between SG [steam generator] and Safety Valve," Revision 0, was not updated (i.e., revised) to evaluate the affects of the increased pressure drop associated with the RSGs. Once identified, the licensee entered the finding into their corrective action program (CAP) as CAP043077 to revise the affected calculations.

The finding was more than minor because the failure to evaluate a change in pressure drop through the RSGs could have caused an adverse effect on the auxiliary feedwater (AFW) pump's flow delivery to the RSGs and could have affected the mitigating systems cornerstone objective. The finding was of very low safety significance because the licensee's analysis showed that adequate design margin remained for the increased pressure drop on the AFW system and did not represent an actual loss of a safety function.

(Section 1R21.1b.1)

Inspection Report# : [2005002\(pdf\)](#)

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Significance: Jul 01, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

FAILED TO USE APPROPRIATE VORTEX METHODOLOGY FOR CST

A finding of very low safety significance was identified by the inspectors for a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requirements. The licensee failed to select an appropriate method for calculating the onset of vortexing at the intake of the AFW suction lines from the condensate storage tank (CST). Specifically, Calculation ENG-ME-293, "Safety Related Tank Usable Volume Evaluation," Revision

3, used a method to determine the minimum height of water above the auxiliary feedwater (AFW) pump's intake to preclude vortex formation that was not appropriate. Once identified, the licensee entered the finding into their corrective action program (CAP) as CAP043276 to revise the affected calculations.

The finding was more than minor because the failure to prevent the formation of vortexing at the intake of the AFW suction lines would result in air entrapment causing pulsating pump flow and/or reduction in pump performance and could have affected the mitigating systems cornerstone objective. The finding was of very low safety significance because the licensee's analysis showed that adequate CST capacity remained for the AFW system and did not represent an actual loss of a safety function. (Section 1R21.1b.2)

Inspection Report# : [2005002\(pdf\)](#)



Significance: Jul 01, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

FAILED TO SPECIFY CORRECT MINIMUM PUMP OPERABILITY LIMITS FOR AFW SURVEILLANCE TESTING

A finding of very low safety significance was identified by the inspectors for a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requirements. The licensee failed to correctly specify the minimum pump operability limits to be used in auxiliary feedwater (AFW) surveillance testing. Specifically, Calculation ENG-ME-576, "AFW Pump Minimum Acceptance Criteria - Proto Power Calculation 96-076, Revision B," Revision 0, did not include the bypass cooling flow to the turbine driven auxiliary feedwater pump (TDAFWP) turbine bearings and governor nor include the potential variability in the speed of the TDAFWP. This resulted in an AFW system hydraulic calculation that was non-conservative when determining the minimum acceptance criteria for the TDAFWP full flow test. Once identified, the licensee verified operability and entered the finding into their corrective action program (CAP) as CAP043273 to revise the test's acceptance criteria.

The finding was more than minor because the failure to account for bypass cooling flow and pump speed variation in the surveillance test acceptance criteria would result in over-predicting the AFW pump's performance (i.e., creating design margin capability that would not exist) and could have affected the mitigating systems cornerstone objective. The finding was of very low safety significance because the licensee's analysis showed that adequate design margin existed for the AFW system and did not represent an actual loss of a safety function. (Section 1R21.2b.1)

Inspection Report# : [2005002\(pdf\)](#)



Significance: Jul 01, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

FAILED TO VALIDATE HEAT-UP TRANSIENT DESIGN ANALYSIS ASSUMPTION FOR AFW PUMP ROOMS

A finding of very low safety significance was identified by the inspectors for a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requirements. The licensee failed to include the affects of increased initial room temperature and heat load addition due to turbine driven auxiliary feedwater pump (TDAFWP) steam leaks when evaluating the auxiliary feedwater (AFW) pump room's temperature on a loss of ventilation. Specifically, Calculation ENG-ME-182, "AFW Pump Room Ventilation System Design," Revision 0, assumed an initial nominal AFW pump room temperature that was not consistent with actual environmental conditions which resulted in a non-conservative heat-up transient design analysis. Once identified, the licensee entered the finding into their corrective action program (CAP) as CAP043301 to revise the affected calculations.

The finding was more than minor because the failure to account for a higher initial room temperature and the potential steam leaks would result in a higher room temperature on a loss of ventilation causing equipment degradation due to the higher than anticipated ambient temperature and could have affected the mitigating systems cornerstone objective. The finding was of very low safety significance because the licensee's heat-up transient design analysis showed that adequate design margin remained for the increased temperature on the AFW system and did not represent an actual loss of a safety function. (Section 1R21.2b.2)

Inspection Report# : [2005002\(pdf\)](#)



Significance: Jul 01, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

FAILED TO INCLUDE AFW PUMP HEAT ENERGY TRANSFER IN LUBE OIL COOLER THERMAL PERFORMANCE ANALYSIS

A finding of very low safety significance was identified by the inspectors for a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requirements. The licensee failed to recognize that the calculated design value for cooling water inlet temperature was higher than that assumed by the auxiliary feedwater (AFW) pump's lube oil cooler thermal performance analysis. Specifically, Calculation MECH-0268.4, "Verification of Heat Removal Capability of the American Standard Heat Exchanger, Model 02030-EF," Revision 0, used an assumed value for cooling water inlet temperature that did not include the AFW pump's heat energy transferred to the cooling water when calculating the lube oil cooler's operating temperature. This resulted in the lube oil cooler's thermal performance analysis being non-conservative. Once identified, the licensee entered the finding into their corrective action program (CAP) as CAP043239 to revise the affected calculations.

The finding was more than minor because the failure to account for the AFW pump's heat energy transferred to the cooling water would result in a higher lube oil cooler operating temperature causing increased turbine bearing and governor degradation and could have affected the mitigating systems cornerstone objective. The finding was of very low safety significance because the licensee's analysis showed that adequate design margin remained for the AFW system and did not represent an actual loss of a safety function. (Section 1R21.3b.1)

Inspection Report# : [2005002\(pdf\)](#)

G**Significance:** Jul 01, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

FAILED TO MAINTAIN INSTRUMENTATION TUBING WATER SOLID

A finding of very low safety significance was identified by the inspectors for a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requirements. The licensee failed to maintain the auxiliary feedwater (AFW) instrumentation tubing suction lines in a water solid condition to pressure switch 17704. The pressure switch performed a safety related function to sense low suction pressure and trip the 11 turbine driven auxiliary feedwater pump (TDAFWP) upon a low level condition in the condensate storage tank (CST). Specifically, a void was discovered in the safety related instrumentation tubing which lowered the effective setpoint for the 11 TDAFW pump's low suction pressure trip. Once identified, the licensee entered the finding into their corrective action program (CAP) as CAP043298 to take corrective actions.

The finding was more than minor because the failure to prevent the formation of a void in the TDAFW pump's instrumentation tubing suction lines would result in air entrapment causing erroneous pressure switch performance and could have affected the mitigating systems cornerstone objective. The finding was of very low safety significance because the licensee's analysis showed that adequate design margin remained for the trip setpoint on the AFW system and did not represent an actual loss of a safety function. (Section 1R21.3b.2)

Inspection Report# : [2005002\(pdf\)](#)

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Physical Protection

[Physical Protection](#) information not publicly available.

Miscellaneous

Significance: N/A Aug 05, 2005

Identified By: NRC

Item Type: FIN Finding

PI&R INSPECTION SUMMARY

The team concluded that the licensee adequately identified, evaluated, and resolved problems within the requirements of the corrective action program (CAP). There were some problems with program implementation, but these problems had been identified by the licensee and actions were underway to resolve them. The team noted a number of observations, including:

The initiation rate of issues entered into the CAP system has been relatively steady for the last two years. About half of the issues being entered were low priority items and were closed rapidly without further evaluation to actions taken, trending, or work orders being issued. This indicated that most issues, even minor ones, were being entered in the CAP.

The quality of apparent cause evaluations and root cause evaluations had improved in the last two years.

Trending of CAP data remained weak with essentially no improvement in the last two years despite the issue being identified by several organizations. Most of the electronic fields on the CAP documents useful for trending such as system, equipment number, process code, failure

mode codes, and other predefined categories were not used in approximately 65 percent of the CAP items. The inspectors noted that most of the trends identified by the licensee in the last year had only been identified within the last two weeks through recent emphasis placed on department roll up meetings. There was little evidence that any trends had been identified by electronic sorting of CAP items using the coded fields.

Corrective actions for several issues focused more on detecting inadequacies rather than preventing them. For example, the corrective actions relied on activities like management reviews, operator rounds and score sheets to catch the problems after they occurred, rather than preventing them from occurring in the first place.

Inspection Report# : [2005009\(pdf\)](#)

Last modified : August 25, 2006