August 12, 2005

Mr. T. Palmisano
Site Vice-President
Prairie Island Nuclear Generating Plant
Nuclear Management Company, LLC
1717 Wakonade Drive East
Welch, MN 55089

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2
NRC SAFETY SYSTEM DESIGN AND PERFORMANCE CAPABILITY
INSPECTION REPORT 05000282/2005002(DRS); 05000306/2005002(DRS)

Dear Mr. Palmisano:

On July 1, 2005, the U. S. Nuclear Regulatory Commission (NRC) completed a safety system design and performance capability inspection at your Prairie Island Nuclear Generating Plant, Units 1 and 2. The enclosed report documents the inspection findings which were discussed on July 1, 2005, with Mr. L. Clewett and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and to compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. Specifically, this inspection focused on the design and performance capability of the auxiliary feedwater system and support systems to ensure that they were capable of performing their required safety related functions.

Based on the results of this inspection, six NRC-identified findings of very low safety significance, all of which involved violations of NRC requirements were identified. However, because these violations were of very low safety significance and because the findings were entered into the licensee's corrective action program, the NRC is treating these findings as Non-Cited Violations in accordance with Section VI.A.1 of the NRC's Enforcement Policy. Additionally, a licensee identified violation is listed in Section 4OA7 of this report.

If you contest the subject or severity of a Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U. S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Prairie Island Nuclear Generating Plant facility.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the Publically Available Records (PARS) component of NRC's

document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Ann Marie Stone, Chief
Engineering Branch 2
Division of Reactor Safety

Docket Nos. 50-282; 50-306
License Nos. DPR-42; DPR-60

Enclosure: Inspection Report 05000282/2005002(DRS); 05000306/2005002(DRS)
w/Attachment: Supplemental Information

cc w/encl: C. Anderson, Senior Vice President, Group Operations
J. Cowan, Executive Vice President and Chief Nuclear Officer
Regulatory Affairs Manager
J. Rogoff, Vice President, Counsel & Secretary
Nuclear Asset Manager
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

document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

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/RA/

Ann Marie Stone, Chief
Engineering Branch 2
Division of Reactor Safety

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-282; 50-306
License Nos:	DPR-42; DPR-60
Report No:	05000282/2005002(DRS); 05000306/2005002(DRS)
Licensee:	Nuclear Management Company, LLC
Facility:	Prairie Island Nuclear Generating Plant, Units 1 and 2
Location:	1717 Wakonade Drive East Welch, MN 55089
Dates:	June 13 through July 1, 2005
Inspectors:	G. Hausman, Senior Reactor Inspector, Lead T. Bilik, Reactor Inspector A. Dunlop, Senior Reactor Inspector G. O'Dwyer, Reactor Inspector S. Sheldon, Reactor Inspector W. Sherbin, Mechanical Engineering Contractor H. Walker, Senior Reactor Inspector
Observer:	J. Jandovitz, Reactor Engineer
Approved by:	A. M. Stone, Chief Engineering Branch 2 Division of Reactor Safety

Enclosure

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SUMMARY OF FINDINGS

IR 05000282/2005002(DRS); 05000306/2005002(DRS); 06/13/2005 - 07/01/2005; Prairie Island Nuclear Generating Plant, Units 1 and 2; Safety System Design and Performance Capability Inspection.

This report covers a three-week period of announced baseline inspection on the design and performance capability of the auxiliary feedwater system and support systems. The inspection was conducted by Region III inspectors and a mechanical engineering consultant. Six Green findings associated with six Non-Cited Violations were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be "Green" or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspector-Identified and Self-Revealed Findings

Cornerstone: Mitigating Systems

- Green. 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)

- Green. 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)

- Green. 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)

- Green. 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)

- Green. 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)

- Green. 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)

B. Licensee-Identified Violations

A violation of very low safety significance, which was identified by the licensee has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and the licensee's corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 and Unit 2 operated at or near full power throughout the inspection period.

1. REACTOR SAFETY

Cornerstone: Mitigating Systems

1R21 Safety System Design and Performance Capability (71111.21)

Introduction: Inspection of safety system design and performance verifies the initial design and subsequent modifications and provides monitoring of the capability of the selected systems to perform design bases functions. As plants age, the design bases may be lost and important design features may be altered or disabled. The plant's risk assessment model was based on the capability of the as-built safety system to perform the intended safety functions successfully. This inspectable area verifies aspects of the mitigating systems cornerstone for which there are no indicators to measure performance.

The objective of the safety system design and performance capability inspection was to assess the adequacy of calculations, analyses, other engineering documents, and operational and testing practices that were used to support the performance of the selected systems during normal, abnormal, and accident conditions.

The system and components selected were from the auxiliary feedwater (AFW) system. This system was selected for review based upon:

- having a high probabilistic risk analysis ranking;
- having had recent significant issues;
- not having received recent NRC review; and
- being interacting systems.

The criteria used to determine the acceptability of the system's performance was found in documents such as:

- applicable technical specifications;
- applicable updated safety analysis report (USAR) sections; and
- the systems' design documents.

The following system and component attributes were reviewed in detail:

System Requirements

Process Medium - water, air, electrical signal;
Energy Source - electrical power, steam, air;
Control Systems - initiation, control, and shutdown actions;

Operator Actions - initiation, monitoring, control, and shutdown; and
Heat Removal - cooling water and ventilation.

System Condition and Capability

Installed Configuration - elevation and flow path operation;
Operation - system alignments and operator actions;
Design - calculations and procedures; and
Testing - level, flow rate, pressure, temperature, voltage, and current.

Component Level

Component Degradation	potential degradation monitored or prevented and component replacement consistent with inservice/equipment qualified life;
Equipment/Environmental Qualification	temperature, humidity, radiation, pressure, voltage and vibration;
Equipment Protection	fire, flood, missile, high energy line breaks (HELBs), freezing, heating, ventilation and air conditioning; and
Component Inputs/Outputs	component inputs/outputs are suitable for application (e.g., inputs/outputs for proper component operation are provided and valves fail in safe configuration).

.1 System Requirements

a. Inspection Scope

The inspectors reviewed the USAR, technical specifications, system descriptions, drawings and available design basis information to determine the performance requirements of the AFW system. The reviewed system attributes included process medium, energy sources, control systems, operator actions and heat removal. The rationale for reviewing each of the attributes was:

Process Medium: This attribute required review to ensure that the selected systems' flow paths would be available and unimpeded during/following design basis events. To achieve this function, the inspectors verified that the systems would be aligned and maintained in an operable condition as described in the plant's USAR, technical specifications and design bases.

Energy Sources: This attribute required review to ensure that the selected systems motive/electrical source would be available/adequate and unimpeded during/following design basis events, that appropriate valves and system control functions would have sufficient power to change state when required. To achieve this function, the inspectors

verified that the interactions between the systems and their support systems were appropriate such that all components would operate properly when required.

Controls: This attribute required review to ensure that the automatic controls for operating the systems and associated systems were properly established and maintained. Additionally, review of alarms and indicators was necessary to ensure that operator actions would be accomplished in accordance with design requirements.

Operations: This attribute was reviewed because the operators perform a number of actions during normal, abnormal and emergency operating conditions that have the potential to affect the selected systems operation. In addition, the emergency operating procedures (EOPs) require the operators to manually realign the systems flow paths during and following design basis events. Therefore, operator actions play an important role in the ability of the selected systems to achieve their safety related functions.

Heat Removal: This attribute was reviewed to ensure that there was adequate and sufficient heat removal capability for the selected systems.

b. Findings

.1 Hydraulic Analysis Not Updated for RSGs (Replacement Steam Generators)

Introduction: The inspectors identified a Non-Cited Violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," having very low safety significance (Green) involving the AFW system's hydraulic design analysis. Specifically, the inspectors determined that the licensee failed to recognize an increased pressure drop in the hydraulic characteristics between the new RSGs and associated main steam SVs. The new RSGs were installed during the 1R23 Refueling Outage in the Fall of 2004.

Description: The inspectors reviewed Calculation ENG-ME-454, "Pressure Drop Between SG [steam generator] and Safety Valve [SV]," Revision 0. The purpose of the calculation was to evaluate the pressure drop between the SGs and the associated main steam SVs to determine the effect of hydraulic resistance on the AFW system's flow delivery to the SGs, since flow delivery is affected by pressure drop. This calculation was used as a design input to Calculation ENG-ME-576, "AFW Pump Minimum Acceptance Criteria-Proto Power Calculation 96-076, Revision B," Revision 0.

The inspectors noted that Calculation ENG-ME-454 had not been updated (i.e., revised) to evaluate the affects on pressure drop due to the new RSGs. In response, the licensee performed an analysis which indicated that with the new SGs, the pressure drop between the SG and the SV was higher for the new RSGs when compared with the old SGs. This increased pressure drop required additional evaluation by the licensee to ensure that adequate design margin existed, such that the increased pressure drop did not have an adverse affect on the AFW system.

The licensee subsequently evaluated the effect of the increased pressure drop on the AFW system's operability and concluded that Calculation ENG-ME-576, which used the ENG-ME-454 calculation results as design input, was conservative. As a result, the

inspectors' review concluded that there was no affect on the AFW system's operability since adequate design margin existed with the back-pressure value used in Calculation ENG-ME-576.

Analysis: The inspectors determined that failure to recognize that an increased pressure drop in the hydraulic characteristics between the new RSGs and associated main steam SVs was a performance deficiency warranting a significance evaluation. The inspectors concluded that the finding was greater than minor in accordance with Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening," issued on April 29, 2002. The finding involved the attribute of design control, where failure to evaluate a change in pressure drop through the RSGs could have caused an adverse effect on the AFW pump's flow delivery to the RSGs, and could have affected the mitigating systems objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage).

The inspectors completed a significance determination of this finding using IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At - Power Situations." The inspectors answered "no" to all five screening questions in the Phase 1 Screening Worksheet under the Mitigating Systems column. The inspectors agreed with the licensee's position that, despite the loss of design margin in the AFW pump's flow delivery to the RSGs, the AFW system would have performed its safety function. Therefore, the inspectors concluded that the finding did not represent an actual loss of a safety function and the finding screened out as having very low safety significance or Green.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that design changes shall be subject to design control measures commensurate with those applied to the original design and that design control measures shall provide for verifying or checking the adequacy of design.

Contrary to the above, as of July 1, 2005, the licensee's design control measures failed to recognize and provide for verifying or checking the adequacy of design to account for an increased pressure drop in the hydraulic characteristics between the new RSGs and associated main steam SVs. Specifically, Calculation ENG-ME-454, "Pressure Drop Between SG 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. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program, this violation is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000282/2005002-01(DRS); 05000306/2005002-01(DRS)).

.2 Vortex Analysis Methodology Not Appropriate

Introduction: The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," having very low safety significance (Green) involving the condensate storage tank (CST) volume's design analysis. Specifically, the inspectors

identified that the licensee failed to select an appropriate method for calculating the onset of vortexing at the intake of the AFW suction lines from the CST.

Description: The inspectors reviewed Calculation ENG-ME-293, "Safety Related Tank Usable Volume Evaluation," Revision 3. The purpose of the calculation was to determine the usable volume for each of the plant's specified safety related tanks, then compare the usable volume to the minimum tank volume identified in the plant's Technical Specifications to ensure that plant procedures specified an adequate tank minimum volume.

The inspectors noted that the methodology used in Calculation ENG-ME-293 to determine the minimum height of water above the AFW pump's intake to preclude vortex formation was not appropriate. The calculation's methodology did not account for the actual fluid configuration where air ingestion into the AFW pump's intake would potential occur. The onset of vortexing was calculated using a methodology developed by Harleman, which is based on selective fluid withdrawal from a stratified fluid consisting of an upper and lower liquid layer *differing slightly in density and similar in viscosity (emphasis added)*. This methodology was described in a paper by Harleman, D. R. F., et. al, Selective Withdrawal From A Vertically Stratified Fluid, Intl. Association for Hydraulic Research, 8th Congress - Montreal, August 24, 1959. The term "stratified fluid" implies a variation in the density of the fluid in the vertical direction.

The inspectors asked the licensee to provide justification for using the Harleman method since the fluid in the CST (e.g., this configuration also applied to the refueling water storage tank (RWST)) was air over water and not a stratified fluid consisting of an upper and lower liquid layer differing slightly in density and similar in viscosity. The licensee was unable to provide adequate technical justification for the methodology used and stated they would consider other methods applicable to this configuration that were more readily accepted by the industry.

The inspectors independently calculated (i.e., using the analysis methodology recommended by the Hydraulics Institute) that the onset of AFW pump inlet vortexing would occur at almost twice the height determined by the Harleman method. The licensee performed a similar calculation using an alternate method and reached the same conclusion – that the usable CST tank capacity was correspondingly reduced by approximately 2500 gallons per tank. Although the usable CST tank capacity was reduced, the inspectors concluded that there was adequate CST capacity and that no safety concern existed for the AFW system.

Although not reviewed by the inspectors, the licensee re-evaluated the potential for vortexing in the RWST by using a more appropriate analysis method and determined that switch-over of residual heat removal pump suction to the sump would occur prior to the level where vortexing in the tank would be a concern.

Analysis: The inspectors determined that failure to select an appropriate method for calculating the onset of vortexing at the intake of the AFW suction lines from the CST was a performance deficiency warranting a significance evaluation. The inspectors concluded that the finding was greater than minor in accordance with IMC 0612, "Power

Reactor Inspection Reports," Appendix B, "Issue Disposition Screening," issued on April 29, 2002. The finding involved the attribute of design control, where 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 objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage).

The inspectors completed a significance determination of this finding using IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At - Power Situations." The inspectors answered "no" to all five screening questions in the Phase 1 Screening Worksheet under the Mitigating Systems column. The inspectors agreed with the licensee's position that, despite the loss of design margin in available CST volume, the AFW system would have performed its safety function. Therefore, the inspectors concluded that the finding did not represent an actual loss of a safety function and the finding screened out as having very low safety significance or Green.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," states, in part, that measures shall be established for the selection and review for suitability of application of processes that are essential to the safety-related functions of the structures, systems and components.

Contrary to the above, as of July 1, 2005, the licensee failed to select and review for suitability an appropriate method for calculating the onset of vortexing at the intake of the AFW suction lines from the 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 AFW pump's intake to preclude vortex formation that was not appropriate. The calculation's methodology did not account for the actual fluid configuration where air ingestion into the AFW pump's intake would potential occur. Once identified, the licensee entered the finding into their corrective action program as CAP043276 to revise the affected calculations. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000282/2005002-02(DRS); 05000306/2005002-02(DRS)).

.2 System Condition and Capability

a. Inspection Scope

The inspectors reviewed design basis documents and plant drawings, abnormal and EOP, requirements, and commitments identified in the USAR and technical specifications. The inspectors compared the information in these documents to applicable electrical, instrumentation and control, and mechanical calculations, setpoint changes and plant modifications. The inspectors also reviewed operational procedures to verify that instructions to operators were consistent with design assumptions.

The inspectors reviewed information to verify that the actual system condition and tested capability was consistent with the identified design bases. Specifically, the inspectors

reviewed the installed configuration, the system operation, the detailed design, and the system testing, as described below.

Installed Configuration: The inspectors confirmed that the installed configuration of the AFW system met the design basis by performing detailed system walkdowns. The walkdowns focused on the installation and configuration of piping, components, and instruments; the placement of protective barriers and systems; the susceptibility to flooding, fire, or other environmental concerns; physical separation; provisions for seismic and other pressure transient concerns; and the conformance of the currently installed configuration of the systems with the design and licensing bases.

Operation: The inspectors performed procedure walk-throughs of selected manual operator actions to confirm that the operators had the knowledge and tools necessary to accomplish actions credited in the design basis.

Design: The inspectors reviewed the mechanical, electrical and instrumentation design of the AFW system to verify that the systems and subsystems would function as required under accident conditions. The review included a review of the design basis, design changes, design assumptions, calculations, boundary conditions, and models as well as a review of selected modification packages. Instrumentation was reviewed to verify appropriateness of applications and set-points based on the required equipment function. Additionally, the inspectors performed limited analyses in several areas to verify the appropriateness of the design values.

Testing: The inspectors reviewed records of selected periodic testing and calibration procedures and results to verify that the design requirements of calculations, drawings, and procedures were incorporated in the system and were adequately demonstrated by test results. Test results were also reviewed to ensure automatic initiations occurred within required times and that testing was consistent with design basis information.

b. Findings

.1 Non-Conservative Acceptance Criteria

Introduction: The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” having very low safety significance (Green) involving the AFW system’s hydraulic design analysis. Specifically, the inspectors identified that the licensee failed to correctly specify the minimum pump operability limits to be used in AFW surveillance testing.

Description: The inspectors reviewed Calculation ENG-ME-576, “AFW Pump Minimum Acceptance Criteria - Proto Power Calculation 96-076, Revision B,” Revision 0. The purpose of the calculation was to develop AFW pump curves to be used in IST procedures when testing the AFW pump. The inspectors identified that the hydraulic analysis, which established the minimum acceptance criteria for the AFW pump, did not include the effect of the flow diversion due to the bypass flow to the turbine driven auxiliary feedwater pumps’ (TDAFWP) turbine bearings and governor cooling lines. In addition, the analysis did not include the affect on the pump curve due to potential

variability in the speed of the turbine. A change in turbine speed would result in a different pump curve. These issues did not affect the motor driven auxiliary feedwater pumps (MDAFWP). However, by not accounting for the bypass flow, the calculation assumed more flow would be delivered to the SGs. Secondly, without correcting for the allowable minimum turbine speed, the calculation was non-conservative when calculating the allowable degradation of the pump curve.

The affect of not evaluating these issues in the calculation was addressed by the licensee to determine the effect on the pump acceptance criteria in the system's test procedures. The licensee determined that the acceptance criteria for the minimum flow tests were still appropriate. However, the acceptance criteria for the full flow test was non-conservative. The most recent pump tests were reviewed by the inspectors. The inspectors determined that adequate design margin remained between the higher minimum test points and current operating points. As a result, the inspectors concluded the AFW system was operable.

The licensee determined that Calculation ENG-ME-576 required revision to include the effects of unaccounted bypass flow and turbine speed variations. In addition, because the calculation determined the acceptance criteria for AFW pump surveillance testing, the procedures for AFW pump testing required revision as well.

Analysis: The inspectors determined that failure to correctly specify the minimum pump operability limits to be used in AFW surveillance testing was a performance deficiency warranting a significance evaluation. The inspectors concluded that the finding was greater than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening," issued on April 29, 2002. The finding involved the attribute of design control, where 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 of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage).

The inspectors completed a significance determination of this finding using IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At - Power Situations." The inspectors answered "no" to all five screening questions in the Phase 1 Screening Worksheet under the Mitigating Systems column. The inspectors agreed with the licensee's position that, despite the loss of design margin in the AFW pump flow delivery to the SGs, the AFW system would have performed its safety function. Therefore, the inspectors concluded that the finding did not represent an actual loss of a safety function and the finding screened out as having very low safety significance or Green.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, as of July 1, 2005, the licensee failed to assure that the minimum pump operability limits to be used in AFW surveillance testing were correctly translated into specifications, drawings, procedures, and instructions. 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 TDAFW pump's turbine bearings and governor and did not include the potential variability in the speed of the TDAFW pump. Once identified, the licensee entered the finding into their corrective action program as CAP043273 to revise the affected documents. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program, this violation is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000282/2005002-03(DRS); 05000306/2005002-03(DRS)).

.2 AFW Room Heat-Up Analysis Deficiencies

Introduction: The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," having very low safety significance (Green) involving the AFW pump room's heat-up transient design analysis. Specifically, the inspectors identified that the licensee failed to include the affects of increased initial room temperature and heat load addition due to TDAFW pump steam leaks when evaluating the AFW pump room's temperature on a loss of ventilation.

Description: The inspectors reviewed Calculation ENG-ME-182, "AFW Pump Room Ventilation System Design," Revision 0, and supporting Calculation 194001-2.5-001, "Unit Cooler Downgrade Study," Revision 0. The purpose of the calculations was to determine the temperature versus time characteristics of the AFW pump room on a loss of room cooling function, which was based on the transient temperature behavior of the room.

The inspectors noted that the calculations assumed the nominal room temperature in the AFW pump room area was 80 degrees Fahrenheit (EF) and that no steam leaks existed that might add heat to the room. On June 14, 2005, during the inspector's walkdown of the AFW pump room area, the inspectors noted that the room temperature was significantly higher than 80 EF. On June 16, 2005, during the 11 TDAFW pump testing, the inspectors observed a small steam leak below the turbine's trip throttle valve. The licensee initiated CAP043301 to document the elevated room temperature and steam leak conditions. The inspectors concluded that since the AFW pump room's heat-up transient design analysis did not consider the room's higher initial temperature and the heat load addition due to the steam leaks, the heat-up transient design analysis was regarded as non-conservative.

The licensee evaluated the affects of not assuming a higher initial room temperature and the additional heat load due to steam leaks on the AFW pump room's heat-up transient design analysis. A draft analysis was performed that showed the predicted room air temperatures would be less than those used for evaluation of the equipment in the AFW pump room as part of the Unit Cooler Downgrade Study. The licensee's review of the completed draft analysis concluded that there was no impact on operability of the AFW pump. The inspectors concurred with this determination. The licensee

stated that there was current action to reperform the AFW pump room's heat-up transient design analysis and that the specific items discussed above would be considered.

Analysis: The inspectors determined that failure to include the affects of increased initial room temperature and heat load addition due to TDAFW pump steam leaks when evaluating the AFW pump room's temperature on a loss of ventilation was a performance deficiency warranting a significance evaluation. The inspectors concluded that the finding was greater than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening," issued on April 29, 2002. The finding involved the attribute of design control, where 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 objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage).

The inspectors completed a significance determination of this finding using IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At - Power Situations." The inspectors answered "no" to all five screening questions in the Phase 1 Screening Worksheet under the Mitigating Systems column. The inspectors agreed with the licensee's position that, despite the loss of design margin in the AFW pump room's heat-up transient design analysis, the AFW system would have performed its safety function. Therefore, the inspectors concluded that the finding did not represent an actual loss of a safety function and the finding screened out as having very low safety significance or Green.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program.

Contrary to the above, as of July 1, 2005, the licensee failed to provide design control measures for verifying or checking the adequacy of design to evaluate the initial design assumptions assumed in the AFW pump room's heat-up transient design analysis. 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 as CAP043301 to revise the affected calculations. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program, this violation is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000282/2005002-04(DRS); 05000306/2005002-04(DRS)).

.3 Components

a. Inspection Scope

The inspectors examined the AFW systems' associated pumps, heat exchangers and instrumentation to ensure that component level attributes were satisfied.

Component Degradation: This attribute verifies that potential degradation was monitored or prevented and component replacement was consistent with inservice and/or equipment qualification life. The inspectors examined existing system programs to ensure that components were adequately maintained.

Equipment/Environmental Qualification: This attribute verifies that the equipment was qualified to operate under the environment in which it was expected to be subjected to under normal and accident conditions. The inspectors reviewed design information, specifications, and documentation to ensure that the AFW system was qualified to operate within the environmental conditions specified in the environmental qualification documentation.

Equipment Protection: This attribute verifies that the AFW system was adequately protected from natural phenomenon and other hazards, such as HELBs, floods or missiles. The inspectors reviewed design information, specifications, and documentation to ensure that the systems were adequately protected from those hazards identified in the USAR, which could impact the systems ability to perform their safety function.

Component Inputs/Outputs: This attribute verifies that the component's inputs and outputs were suitable for the application and would be acceptable under accident conditions. For example, the valve fails in a safe configuration and the required inputs to components, such as coolant flow, electrical voltage, and control air necessary for proper component operation were provided. The inspectors reviewed design information, specifications, and documentation and ensured that selected system components were provided inputs and/or outputs suitable for the application.

b. Findings

.1 Lube Oil Cooler Analysis Deficiencies

Introduction: The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," having very low safety significance (Green) involving the AFW pump's lube oil cooler thermal performance analysis. Specifically, the licensee failed to recognize that the calculated design value for cooling water inlet temperature was higher than that assumed by the AFW pump's lube oil cooler thermal performance analysis.

Description: The inspectors reviewed Calculation MECH-0268.4, "Verification of Heat Removal Capability of the American Standard Heat Exchanger, Model 02030-EF,"

Revision 0. The purpose of the calculation was to confirm the heat removal capability of the AFW pump's lube oil cooler. The cooling water's flow path was configured, such that prior to entering the heat exchanger the cooling water passed through the AFW pump. During AFW pump operation, due to inefficiencies of the pump, the pump transfers energy in the form of heat to the water passing through the pump. This heat energy transfer
(i.e., pump heat energy transferred to the cooling water) raises the temperature of the cooling water several degrees before the cooling water enters the lube oil cooler.

The inspectors noted that in Calculation MECH-0268.4, the licensee failed to recognize that the assumed value for cooling water inlet temperature did not include the pump's heat energy transferred to the cooling water when calculating the AFW pump's lube oil cooler's operating temperature. By not including the pump's heat energy transfer to the cooling water, the calculation was non-conservative by several degrees Fahrenheit when predicting the AFW pump's lube oil cooler's operating temperature.

The licensee subsequently evaluated the effect of not including the pump's heat energy transfer in the heat exchanger's thermal performance analysis. The licensee determined that there was no impact on operability of the AFW pump's lube oil coolers because the limit for lube oil temperature out of the pump bearing was 160 EF and preliminary calculations indicated that the predicted temperature out of the lube oil cooler would be 154 EF when accounting for the AFW pump's heat energy transfer. The inspectors reviewed the licensee's evaluation and concluded that there would be no affect on operability of the lube oil coolers when accounting for the higher cooling water inlet temperature. The licensee determined that Calculation MECH-0268.4 needed to be revised and issued CAP043239, "AFW Lube Oil Cooler Calculation," dated June 27, 2005, to revise the subject calculation.

Analysis: The inspectors determined that failure to account for the pump's heat energy transfer when calculating cooling water inlet temperature to the AFW pump's lube oil coolers was a performance deficiency warranting a significance evaluation. The inspectors concluded that the finding was greater than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening," issued on April 29, 2002. The finding involved the attribute of design control, where 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 objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences
(i.e., core damage).

The inspectors completed a significance determination of this finding using IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At - Power Situations." The inspectors answered "no" to all five screening questions in the Phase 1 Screening Worksheet under the Mitigating Systems column. The inspectors agreed with the licensee's position that, despite the loss of design margin in the AFW pump's lube oil cooler thermal performance analysis, the AFW system would have performed its safety function. Therefore, the inspectors concluded that the finding did not represent

an actual loss of a safety function and the finding screened out as having very low safety significance or Green.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program.

Contrary to the above, as of July 1, 2005, the licensee's design control measures failed to recognize and provide for verifying or checking the adequacy of design by validating that the calculated design value for cooling water inlet temperature was higher than that assumed by the 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. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program, this violation is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000282/2005002-05(DRS); 05000306/2005002-05(DRS)).

.2 Void in TDAFW Pump Instrumentation Line

Introduction: The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," having very low safety significance (Green) involving the AFW pump's suction pressure instrumentation. Specifically, the inspectors identified that the licensee failed to assure that the design bases requirement to maintain the AFW instrumentation tubing suction lines in a water solid condition was not correctly translated into specifications, drawings, procedures, and instructions.

Description: On June 14, 2005, the inspectors conducted a walkdown of the AFW system. During the walkdown, the inspectors observed that some instrument tubing for the 11 TDAFW pump was installed with a large inverted U-shaped loop. The instrumentation tubing was attached to the suction pressure switch 17704, which performed a safety related function to sense low suction pressure and trip the TDAFW pump upon a low level condition in the CST. All AFW pumps were installed with a similar configuration, although not as pronounced as that on the 11 TDAFW pump.

When the inspectors asked the licensee how the instrumentation tubing lines were assured to be water solid, the licensee responded that there was no periodic procedure to vent these lines. Data from a surveillance (SP 1102) conducted on June 15, 2005, recorded local suction pressure 1.1-psi higher than expected from the recorded height of the water in the CST. The licensee walked down the systems on June 29, 2005, and local suction pressure indication was approximately 1.7 psi higher than expected from

the height of the water in the CST. This data indicated that there was a void in the instrumentation tubing. On June 30, 2005, the licensee vented the instrumentation line and observed a change of 1.5 psi in the local indicated pressure. The change in pressure corresponded to an approximate 42-inch long void in the instrumentation tubing. The inspectors noted that this void would also expand as the pressure dropped in the system during operation. The licensee calculated that, if called upon, the pump would not have tripped until the CST level was approximately 55-inches lower than expected. Although the CST would have emptied, sufficient net positive suction head was available due to the large suction header piping. The licensee subsequently evaluated the effect of the setpoint bias on operability and concluded that the AFW system would have performed its safety function.

Analysis: The inspectors determined that failure to maintain the AFW instrumentation tubing suction lines in a water solid condition to pressure switch 17704 was a performance deficiency warranting a significance evaluation. The inspectors concluded that the finding was greater than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening," issued on April 29, 2002. The finding involved the attribute of design control, where 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 objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage).

The inspectors completed a significance determination of this finding using IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At - Power Situations." The inspectors answered "no" to all five screening questions in the Phase 1 Screening Worksheet under the Mitigating Systems column. The inspectors agreed with the licensee's position that, despite the significant loss of design margin in the trip setpoint, the AFW system would have performed its safety function. Therefore, the inspectors concluded that the finding did not represent an actual loss of a safety function and the finding screened out as having very low safety significance or Green.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, as of July 1, 2005, the licensee failed to assure that the design bases requirement to maintain the AFW instrumentation tubing water solid was not correctly translated into specifications, drawings, procedures, and instructions. 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 as CAP043298 to take corrective actions. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program, this violation is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000282/2005002-06(DRS); 05000306/2005002-06(DRS)).

4. OTHER ACTIVITIES (OA)

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed a sample of problems associated with the AFW system that were identified and entered into the CAP by the licensee. The inspectors reviewed these issues to verify an appropriate threshold for identifying issues and to evaluate the effectiveness of corrective actions related to design issues. In addition, condition reports written on issues identified during the inspection were reviewed to verify adequate problem identification and incorporation of the problem into the corrective action system. The specific corrective action documents that were sampled and reviewed by the team are listed in the attachment to this report.

b. Findings

No findings of significance were identified.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. L. Clewett and other members of licensee management at the conclusion of the inspection on July 1, 2005. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Interim Exit Meetings

None.

4OA7 Licensee-Identified Violations

The following violation of very low significance was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Manual, NUREG-1600, for being dispositioned as an NCV.

Cornerstone: Mitigating System

Criterion III, “Design Control,” of 10 CFR Part 50, Appendix B requires, in part, that measures be established to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled. Design changes shall be subject to design control measures commensurate with those applied to the original design, including verifying or checking the adequacy of the design by the performance of design reviews, calculations, or testing. Inadequate design

control measures for the AFW system resulted in the installation of non-safety related air receivers, check valves, and piping for the safety related TDAFW pump steam admission control valves during an inappropriate design change in 1981. The calculation for sizing the air receivers and the testing conducted were also inadequate to verify the modification's design requirements. The licensee did not have a clear understanding of the system design, nor was any periodic testing of the control valves' air system conducted to ensure continued operability. This was identified in the licensee's corrective action program (CAP) as CAP042775 and CAP043013. This finding is of very low safety significance because the licensee concluded the valves would function as required.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee
L. Clewett, Plant Manager, Prairie Island Nuclear Generating Plant
J. Kivi, Regulator Compliance Engineer, Regulatory Affairs
C. Lambert, Vice President, Corporate Engineering
T. Lillehei, Engineer, Analysis/Design Configuration Engineering
S. Leingang, Engineer, Engineering Plant & Systems
S. McCall, Manager, Engineering Programs
C. Mundt, Manager, Engineering Plant & Systems
S. Myers, Supervisor, Analysis/Design Configuration Engineering
S. Northard, Manager, Business Support
E. Perry, Manager, Nuclear Oversight
K. Peterson, Engineer, Inspection & Material Engineering
M. Runion, Manager, Engineering Design
G. Salamon, Manager, Regulatory Affairs
T. Silverberg, Director, Site Engineering
D. Smith, Shift Manager/EOP Writer, Procedures
S. Thomas, Engineer, Analysis/Design Configuration Engineering

Nuclear Regulatory Commission
J. Adams, Senior Resident Inspector
D. Karjala, Resident Inspector
A. M. Stone, Chief, Engineering Branch 2

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000282/2005002-01(DRS); 05000306/2005002-01(DRS)	NCV	Failed to Update Pressure Drop Calculation for Replacement Steam Generators (Section 1R21.1b.1)
05000282/2005002-02(DRS); 05000306/2005002-02(DRS)	NCV	Failed to Use Appropriate Vortex Methodology for CST (Section 1R21.1b.2)
05000282/2005002-03(DRS); 05000306/2005002-03(DRS)	NCV	Failed to Specify Correct Minimum Pump Operability Limits for AFW Surveillance Testing (Section 1R21.2b.1)
05000282/2005002-04(DRS); 05000306/2005002-04(DRS)	NCV	Failed to Validate Heat-Up Transient Design Analysis Assumption for AFW Pump Rooms (Section 1R21.2b.2)
05000282/2005002-05(DRS); 05000306/2005002-05(DRS)	NCV	Failed to Include AFWP Heat Energy Transfer in Lube Oil Cooler Thermal Performance Analysis (Section 1R21.3b.1)
05000282/2005002-06(DRS); 05000306/2005002-06(DRS)	NCV	Failed to Maintain Instrumentation Tubing Water Solid (Section 1R21.3b.2)

Closed

05000282/2005002-01(DRS); 05000306/2005002-01(DRS)	NCV	Failed to Update Pressure Drop Calculation for Replacement Steam Generators (Section 1R21.1b.1)
05000282/2005002-02(DRS); 05000306/2005002-02(DRS)	NCV	Failed to Use Appropriate Vortex Methodology for CST (Section 1R21.1b.2)
05000282/2005002-03(DRS); 05000306/2005002-03(DRS)	NCV	Failed to Specify Correct Minimum Pump Operability Limits for AFW Surveillance Testing (Section 1R21.2b.1)
05000282/2005002-04(DRS); 05000306/2005002-04(DRS)	NCV	Failed to Validate Heat-Up Transient Design Analysis Assumption for AFWP Rooms (Section 1R21.2b.2)
05000282/2005002-05(DRS); 05000306/2005002-05(DRS)	NCV	Failed to Include AFWP Heat Energy Transfer in Lube Oil Cooler Thermal Performance Analysis (Section 1R21.3b.1)
05000282/2005002-06(DRS); 05000306/2005002-06(DRS)	NCV	Failed to Maintain Instrumentation Tubing Water Solid (Section 1R21.3b.2)

Discussed

None

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety but rather that selected sections of portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

CALCULATIONS

Number	Description/Title	Date/Revision
91-02-22	Battery 22 Calculation	0
01110-C-006	MSS AOVs Functional and MEDP	0
01110-C-026	AOV CLC for MSS Valves CV-31998, CV-31999	0
12911.6249-E-002	MCC 120V Control CKT Voltage Drop Calculation	1
194001-2.5-001	Unit Cooler Downgrade Study	0
21-6197	Determine AFWP Discharge Piping Design Press	0
B11.277.1	Size Air Receivers for AFWP	August 15, 1980
E-385-EA-3	APS Safeguard Low Voltage SWGR Short CKT Duty	1
E-385-EA-9	Relay Settings and Coordination	2
E-385-EA-21	480V SWGR Branch Breaker Settings	2
E-415-EA-3	Degraded Voltage Relay Dropout	1
ENG-EE-061	U1 4kV Bus Minimum Voltage	0
ENG-EE-147	Motor Operated Valve Terminal Voltage Calculation	0
ENG-ME-046	MV-32017, MV-32025, MV-32238 Thrust Calculations	3 & 4
ENG-ME-182	AFWP Room Ventilation Design	0
ENG-ME-293	Tank Sizing	3
ENG-ME-320	AFWP NPSH Calculation	1
ENG-ME-443	CST Sizing	3
ENG-ME-454	Press Drop Between SGs and SVs	0
ENG-ME-461	EPRI PPM for TDAFWP Discharge MOV's	0
ENG-ME-551	H_2O to AFWP with Out-of-Tolerance Press Switch	0
ENG-ME-571	H_2O Volume Used by AFW Pumps Following Loss of CST	0
ENG-ME-576	AFWP Min Accept Criteria-ProtoPwr Cal 96-076 Revision B	0
ENG-ME-586	Flooding Effects AFWP Room Postulated Pipe Rupture	0
ENG-ME-611	Eval CL System Response Following a Seismic Event	0
ENG-ME-621	CV-31998 and CV-31999 Air Receiver Capacity	July 13, 2005
MECH-0268.4	Verification Heat Removal Capability American Std HX	0
PI-P-064	Condensate Make-Up System	0
SPCAF001	TDAFWP Low Discharge Press Trip	2
SPCAF002	MDAFWP Low Discharge Press Trip	2
SPCAF003	U1 ERCS Based AFW Flow Indication Uncertainty	0
SPCAF004	AFWP Suction Press Indication	0

CALCULATIONS

Number	Description/Title	Date/Revision
SPCAF005	ERCS Based AFWP Discharge Press Indication	0
SPCEP053	AFW Flow Control Indication Loop 23122 Uncertainty	0
SPCRP025	FW Flow vs SG Head Volume	1 and 2

CORRECTIVE ACTION PROGRAM DOCUMENTS ISSUED DURING INSPECTION

Number	Description/Title	Date/Revision
ACE008990	Relief Request Not Submitted AFWP Testing Accuracy	July 1, 2005
ACE008992	Air Entrainment in the 11 TDAFWP Instrument Line	July 6, 2005
CA010992	Discrepancy Between SPCAF003, SPCEP53A and 54A	June 14, 2005
CA010993	Discrepancy Between SPCAF003, SPCEP53A and 54A	June 14, 2005
CA011021	Temporary Power in D3 Lunchroom (Q-62)	June 16, 2005
CA011022	Steam Flow d/p Between SGs and SVs (Q-51)	June 16, 2005
CA011032	Clarify Air Receivers' DB for CV-31998 and CV-31999	June 16, 2005
CA011032	Eval if Check Valves Should Be in IST Program	June 16, 2005
CA011079	CST Level Transmitter Calibration Offset (Q-100)	June 22, 2005
CA011112	AFW Lube Oil Cooler Calculation (Q-116)	June 28, 2005
CA011121	Ensure IST Check Valve Tests Done in Proper Order	June 29, 2005
CA011164	AFWP Room Heat-Up Analysis	July 5, 2005
CA011219	Discrepancy Between SPCAF003, SPCEP53A, and 54A	July 8, 2005
CA043099	Small Steam Leak on 11 TDAFWP	June 16, 2005
CAP043055	Discrepancy Between SPCAF003, SPCEP53A, and 54A	June 13, 2005
CAP043073	Temporary Power in D3 Lunchroom (Q-62)	June 14, 2005
CAP043074	Freon Line to D3 Lunchroom A/C Unsupported (Q-63)	June 14, 2005
CAP043077	Steam Flow d/p Between SGs and SVs (Q-51)	June 15, 2005
CAP043083	Logic Drawing Error NF-40312 for 11 TDAFWP (Q-71)	June 15, 2005
CAP043092	AFW Suction Press Switch Instr Line Venting (Q-68)	June 15, 2005
CAP043095	Improper Thread Engagement AFW Discharge (Q-85)	June 15, 2005
CAP043108	Incorrect Reference in DBD-SYS-28B - AFW (Q-83)	June 16, 2005
CAP043110	AFW/CL Components Shown on Correct Drawing?	June 16, 2005
CAP043112	Review Requirements for MS-41-11 and AF-25-7 (Q-97)	June 16, 2005
CAP043117	EOPs/AOPs Do Not Reflect AFWP Min-Flow (Q-93)	June 16, 2005
CAP043120	TDAFWP Oil Levels During Performance of SP1102	June 17, 2005
CAP043143	Vent AFWP Suction Press Switch Sensing Line (Q-68)	June 20, 2005
CAP043152	CST Level Transmitter Calibration Offset (Q-100)	June 21, 2005
CAP043231	Determine/Qualify Flow Leakage Needs (Q-112)	June 26, 2005
CAP043234	KNPP TDAFWP Issues During Post-Mod Testing	June 27, 2005

CORRECTIVE ACTION PROGRAM DOCUMENTS ISSUED DURING INSPECTION

Number	Description/Title	Date/Revision
CAP043239	AFW Lube Oil Cooler Calculation (Q-116)	June 27, 2005
CAP043260	Ensure IST Check Valve Tests Done in Proper Order	June 28, 2005
CAP043272	Seismic Housekeeping Unsecured Pedestal Fan	June 29, 2005
CAP043273	Non-Conservative Acceptance Criteria TDAFW Test	June 29, 2005
CAP043274	Relief Request Not Submitted for AFWP Test (Q-134)	June 29, 2005
CAP043275	Cotter Pin Found During NRC Inspector Walkdown	June 29, 2005
CAP043276	Vortex Formation Method Questionable (Q-135)	June 29, 2005
CAP043285	No Screen Performed for Change to SP1101 (Q112)	June 30, 2005
CAP043286	MIC UT Report Used Inappropriate Cal Block	June 30, 2005
CAP043289	Tubing Spec Does Not Address Industry Guidance	June 30, 2005
CAP043298	Air Entrainment in the 11 TDAFWP Instrument Line	June 30, 2005
CAP043301	AFWP Room Heat-Up Analysis	July 1, 2005
OBD000140	Improper Thread Engagement AFW Discharge (Q-85)	June 17, 2005
CE008174	Discrepancy Between SPCAF003, SPCEP53, and 54A	June 14, 2005
CE008194	AFW Suction Press Switch Instrument Line Venting	June 16, 2005
CE008209	EOPs/AOPs Do Not Reflect AFWP Min-Flow (Q-93)	June 17, 2005
CE008264	Determine/Qualify Flow Leakage Needs (Q-112)	June 27, 2005
CE008201	Review Requirements for MS-41-11 and AF-25-7 (Q-97)	June 17, 2005
CE008211	AFW/CL Components Shown on Correct Drawing?	June 17, 2005
CE008292	Past Operability for Seismic Housekeeping CAP43272	July 1, 2005
CE008293	Eval Seismic Housekeeping Reportability CAP43272	July 1, 2005
CE008294	Eval/Initiate CAs for Seismic Housekeeping CAP43272	July 1, 2005
CE008295	Non-Conservative Acceptance Criteria TDAFW Test	July 1, 2005
CE008297	Relief Request Not Submitted for AFWP Test (Q-134)	July 1, 2005
CE008298	Vortex Formation Method Questionable (Q-135)	July 1, 2005
CE008300	2005 SSDPC AFW Inspection Q112 regarding SP1101	July 1, 2005
CE008301	2005 SSDPC AFW Inspection Q112 regarding SP1101	July 1, 2005
CE008302	MIC UT Report Used Inappropriate Cal Block	July 1, 2005
CE008303	MIC UT Report Used Inappropriate Cal Block	July 1, 2005
CE008305	Tubing Spec Does Not Address Industry Guidance	July 5, 2005
CE008307	Air Entrainment in the 11 TDAFWP Instrument Line	July 5, 2005
CE008308	Air Entrainment in the 11 TDAFWP Instrument Line	July 5, 2005
CE008343	Relief Request Not Submitted for AFWP Test (Q-134)	July 11, 2005
MRE000475	Air Entrainment in the 11 TDAFWP Instrument Line	July 5, 2005
PCR011240	Review Requirements for MS-41-11 and AF-25-7 (Q-97)	July 11, 2005
PCR011246	AFW Suction Press Switch Instr Line Venting (Q-68)	July 12, 2005
OE011110	External Operating Experience	June 28, 2005
OTH039387	Housekeeping D3 Room with Respect to 2LT-723/724	June 16, 2005
OTH039410	Eval Potential Rev To C28.1 AOP2 (Q-120)	June 117, 2005

CORRECTIVE ACTION PROGRAM DOCUMENTS ISSUED DURING INSPECTION

Number	Description/Title	Date/Revision
OTH039427	Revise USAR Include AFW Backup H_2O Supply (Q-91)	June 20, 2005
OTH039548	DG Load Calc Justify Using Nameplate Values (Q-95)	June 24, 2005
OTH039538	Update the AFWP Room Heat-Up Analysis (Q-104)	June 24, 2005
OTH039622	Revise Calc ENG-ME-293 for Vortex Determination	June 29, 2005

CORRECTIVE ACTION PROGRAM DOCUMENTS ISSUED PRIOR TO INSPECTION

Number	Description/Title	Date/Revision
ACE008753	PS17776 As-Found Data > As-Found Tolerance	July 29, 2003
CAP029876	Eval 2LT-723/724 21CST Level Transmitter	April 22, 2003
CAP032339	New Calculation Analysis Issued for 22 Battery	September 9, 2003
CAP032686	TDAFWP Overspeed Limit Switch Mounted Incorrectly	September 19, 2003
CAP034884	AFW Suction Line Has MIC Bacteria Present	January 14, 2004
CAP040184	AFWP # 22 Outlet Temperature High	December 2004
CAP041325	AF-15-10 Check Req 2 Attempts to Pass (SP1355B)	March 12, 2005
CAP041527	Eval Kewaunee AFWP Operability Concern for PINGP	----------
CAP042079	MOV Program Doc Identified During SSDI SA	May 2, 2005
CAP042775	Air Receiver DB for CV-31998 and CV-31999 Unclear	May 28, 2005
CAP043013	Clarify Air Receiver DB for CV-31998 and CV-31999	June 9, 2005
CE002537	Eval 2LT-723 and 724 21 CST Level Transmitter	April 23, 2003
OE030553	AFWP Recirc Line Orifice Fouling	January 26, 2004
OE036088	TR4-42 Review of Air-Operated Valve Related Events	December 3, 2004

DRAWINGS

Number	Description/Title	Date/Revision
----------	CVCS Piping Relief Line to Hold-Up Tanks	August 13, 1974
717J361	SG Assembly	11
1097J74	51 Series SG Arrangement	4
A6655	Condensate Make-Up Piping	July 14, 1970
A6655	Condensate Make-Up Piping	8
B-15300	Min Flow Orifice Assy.	August 26, 1970
ND-2-3-157B	AFW	2
NE-40006 Sh 1	S/D U1/U2 Safeguard 4160V SWGR	XY
NE-40006 Sh 8	S/D U1/U2 Safeguard 4160V SWGR	AF
NE-40006 Sh 59	S/D U1/U2 Safeguard 4160V SWGR	AH
NE-40008 Sh 1	S/D U1 Safeguard 480V SWGR and Aux	CJ
NE-40008 Sh 21	S/D U1 Safeguard 480V SWGR and Aux	BS
NE-40008 Sh 22	S/D U1 Safeguard 480V SWGR and Aux	CA
NE-40008 Sh 67	S/D U1 Safeguard 480V SWGR and Aux	BZ
NE-40008 Sh 89	S/D U1 Safeguard 480V SWGR and Aux	BZ

DRAWINGS

Number	Description/Title	Date/Revision
NE-40008 Sh 90	S/D U1 Safeguard 480V SWGR and Aux	BT
NE-40009 Sh 1	S/D DC Aux and Emergency AC	DG and CA
NE-40009 Sh 97.2	11 TDAFWP MS Supply Valve CV-31998	DT
NE-40406 Sh 1	S/D Safeguards U2 480 V SWGR AUX	AT
NE-40406 Sh 16	CW to 21 AFWP	AF
NE-40406 Sh 45	S/D 21/22 AFW to 21 S/G Isol Valve MV-32248	AN
NE-40409 Sh 1	S/D DC Aux and Emergency AC	DC
NE-40409 Sh 81.1	S/D DC Aux and Emergency AC	EQ
NE-116785	S/D 4.16KV SWGR Safeguard Bus 25	ES
NE-116785 Sh 22	21 AFWP Bus 25 Cubicle 10	B
NF-39216-1	Flow Diagram - U1 and 2 CW - Screen House	AJ
NF-39216-2	Flow Diagram - U1 CW - Turbine Building	AD
NF-39217-1	Flow Diagram - U2 CW - Turbine Building	AF
NF-39218	Flow Diagram - U1 Main Aux Steam and Steam Dump	BK
NF-39219	Flow Diagram - U2 Main Aux Steam and Steam Dump	BD
NF-39220	Condensate System	BF
NF-39222	Flow Diagram - U1 FW System	BA
NF-39223	Flow Diagram FW System	AZ
NF-39233	Turbine Building Traps and Drains	AL
NF-39244	Instrument Air Piping	AV
NF-40022-1	CKT Diagram - 4kV and 480V Safeguard Busses U1	G
NF-40022-2	CKT Diagram - 4kV and 480V Safeguard Busses U2	F
NF-40224-3	External Connections MCC 1A, 1LA and 1T	AT
NF-40312-1	Interlock Logic Diagram AFW - U1	AB
NF-40312-2	Interlock Logic Diagram AFW - U1	U
NF-40767-1	Interlock Logic Diagram AFW - U2	V
NF-40767-2	Interlock Logic Diagram AFW - U2	S
NQ-118234	12-in Condensate Make-Up AFWP Suction Piping ISO	A
X-HIAW106-0233	Piping ISO Cooling H_2O Turbine Room A-6653	E
X-HIAW106-7684	Seismic Anchor MK CMH-27	A
X-HIAW106-7685	Seismic Anchor MK CMH-28	A
X-HIAW106-7686	Seismic Anchor MK CMH-29	A
X-HIAW106-7687	Seismic Anchor MK CMH-30	A
X-HIAW258-0022	Expected Performance Pacific Pump PO17172	July 29, 1974
X-HIAW258-0028	Turbine Curve Number 35238 D-1	July 29, 1974
X-HIAW258-0029	Turbine Curve Number 35339 TT	July 29, 1974

MODIFICATIONS

Number	Description/Title	Date/Revision
80L579	AFWP Press Switch	March 30, 1984
80Y129	Free AFWP Steamer of All AC Power	November 9, 1982
84L838 Part A	AFWP 11 Turbine Steam Supply Valve Relocation	0
84L838 Part B	AFWP 22 Turbine Steam Supply Valve Relocation	0
86L898	Replace U1/U2 AFW Steam Traps 12 with Orifices	1
87Y820	AFW CW Suction Supply Flush Valves	0
96AF01	AFWP Run-out Protection	1
97AF02	AMSAC/Diverse Scram System	June 27, 2001

OPERABILITY RECOMMENDATIONS

Number	Description/Title	Date/Revision
OPR000551	Clarify Air Receivers DB for CV-31998 and CV-31999	June 9, 2005
OPR000552	Improper Thread Engagement on AFW Flow Element	June 15, 2005
OPR000553	Air Entrainment in the 11 TDAFWP Instrument Line	July 1, 2005
OPR001478	CST Level Transmitters 2LT-723/724	0

PROCEDURES

Number	Description/Title	Date/Revision
47010-0105	11 TDAFWP Accumulator Lo Air Press	38
47010-0205	11 TDAFWP Lo Suct Or Disch Press Trip	38
47010-0206	11 TDAFWP Overspeed Trip	38
47010-0305	11 TDAFWP Local Control SI Auto Start Blocked	38
47010-0306	11 TDAFWP System Valve(s) Local Control	38
1C28.1	AFW System U1	13
1E-0	U1 Reactor Trip or Safety Injection	23
1E-1	U1 Loss of Reactor or Secondary Coolant	21
1E-3	U1 SG Tube Rupture	20
222ECA-0.0	Loss of All Safeguards AC Power	19
2C28.1	AFW System U2	13
2C28.1 AOP4	Restart AFWP After Low Suction/Discharge Press Trip	0
47010-0505	11 TDAFWP Lube Oil Lo Press	38
47010-0605	11 TDAFWP Oil Hi Temp	38
47510-0103	21 AFWP Locked Out	37
47510-0203	21 AFWP Overload	37
47510-0303	21 AFWP Local Control SI Auto Start Blocked	37
47510-0402	21 AFWP System Valve(s) Local Control	37
47510-0503	21 AFWP Lube Oil Lo Press	37
47510-0603	21 AFWP Oil Hi Temp	37

PROCEDURES

Number	Description/Title	Date/Revision
5AWI 8.9.0	Internal Flooding Drainage Control	2
C12.3	Heat Tracing System	20
C28.1 AOP1	Steam Binding of an AFWP	4
C28.1 AOP2	Loss of Condensate Supply to AFWP Suction	5
C28.1 AOP3	AFW System Operation When AC Power is Lost	1W
C28-2	AFW System U1	43
C28.6	Condensate Storage Tank Freeze Protection	12
DS104.1	Zebra Mussel Control Treatment: CW System	1
EHI-5100	Piping, Valves and Pipe Support System Design Codes	1
H5	Motor Operated Valve Program	9
H10.1	ASME Sect XI Pump and Valve Program IST	17
H27	Control of Steam Exclusion Boundaries	8
H36	Plant Flooding	0
H49	Service Water and Fire Protection Inspection Program	1
PE0007	5HK250/350 Breaker Testing Maint and Repair - Minor	3
SWI NDE-UT-9	Ultrasonic Detection of Pitting	0
TP1636	Summer Plant Operation	19

REFERENCES

Number	Description/Title	Date/Revision
----------	IST Results for 2003-2005 AFW Pumps and Valves	----------
----------	11 TDAFWP 48 Hour Endurance Test	April 28, 1980
----------	MOV Static Test Data Evaluation MV-32238	November 16, 2000
----------	Diagnostic Test Results for AOV CV-21998	November 24, 2002
----------	DB Paper for CV-31998 and CV-31999 Air Receiver	July 14, 2005
35239-A	12 AFWP Test Curve	June 18, 1971
35239-B	21 AFWP Test Curve	June 19, 1971
35239-C	11 AFWP Test Curve	August 17, 1971
35239-D	22 AFWP Test Curve	August 17, 1971
C1.1.20.6-1, Pg 23 of 27	U1 480V Switches and Indication Checklist 11/12 AFWP to 11 S/G Isol MV-32242 SFGD Hold Card #1-139	33
C1.1.20.6-1, Pg 24 of 27	U1 480V Switches and Indication Checklist 11/12 AFW to 1B S/G Isol MV-32243 SFGD Hold Card #1-141	33
C1.1.20.6-2A, Pg 21 of 22	U2 480V Switches and Indication Checklist 21/22 AFW to 21 S/G Isol MV-32288 SFGD Hold Card#2-093	35

REFERENCES

Number	Description/Title	Date/Revision
C1.1.20.6-2A, Pg 22 of 22	U2 480V Switches and Indication Checklist 21/22 AFWP to 22 SG Isol MV-32294 SFGD Hold Card# 2-097	35
Cable Spec 563	CHAMPS Spec Report 12 AFWP Power Cable	June 16, 2005
Cable Spec 16827	CHAMPS Spec Report 21 AFWP Power Cable	June 16, 2005
ECP-2.3	125Vdc System Coordination Study	0
EDS Sect 3.2.1.6	EDS Specification for Instrument Tubing	2
EWR036414	List of Accident Analysis Credited Operator Actions	December 20, 2004
EWR038964	Lessons Learned from Point Beach AF Issues	May 18, 2005
FOI A0781	Basis for AFWP Requirements After Line Break	November 18, 1992
H8-A Pg 7 of 57	EQ User's Manual App A EQ Master List 1LT-723/724	13
H8-A Pg 19 of 57	EQ User's Manual App A EQ Master List 2LT-723/724	13
JPM AF-8S	Restore AFW Flow After AFWP Low Press Trip	3
JPM AF-9S	Restore AFW Flow After AFWP Low Press Trip (Emer)	0
JPM CD-1S	CW Lined up to 11 and/or 12 AFWP	4
M-380	EDS for Specification for Piping Materials	6
NRC/NSP Letter	SER NUREG-0737 II.E.1.1 and II.E.1.2 for AFW System	March 22, 1982
NSP/NRC Letter	AFW Systems	November 21, 1979
NSP/NRC Letter	AFW System Information	February 4, 1981
NSP/NRC Letter	Initial Response to NRC Bulletin 88-04	July 7, 1988
NSP/NRC Letter	Supplemental Response to NRC Bulletin 88-04	November 10, 1988
PCR20042100A	SP 1101 Update for IST	March 8, 2005
PI-24.3B.001	EQ Summary Checklist Foxboro Model N-E-10 Series	1
PI-25E.01.001	EQ Summary Checklist Limitorque Test Report 600456	7
TIA 2001-10	NRC Response DG Single Failure for External Events	September 4, 2003

50.59 EVALUATIONS

Number	Description/Title	Date/Revision
SE375	Reclassify Equipment Heat Removal System	0
SE470	AFWP Runout Protection	1 and 2
SE474	Main FW Line Break	0

50.59 SCREENS

Number	Description/Title	Date/Revision
2227	Calculation ENG-ME-586	0

SURVEILLANCES

Number	Description/Title	Date/Revision
SP1101	12 MDAFP Quarterly Flow and Valve Test	June 2, 2005
SP1102	11 TDAFWP Monthly Test	December 5, 2003
SP1223A	Event Monitoring Transmitters Calibration/Inspection	December 16, 2002, June 10, 2004
SP1224	Event Monitoring Instrument Calibration	August 8, 2002, December 18, 2003
SP1234A	11 AFW Suction/Discharge Press Switches Calibration	November 4, 2004
SP1355A	Train A AFW Quarterly Check Valve Testing	January 29, 2005
SP1355B	Train B AFW Quarterly Check Valve Testing	March 12, 2005
SP1359	Refueling Test of AFW Discharge Check Valves	October 21, 2004
SP2101	21 MDAFWP Once Every Refueling SD Flow Test	March 2, 2002, June 11, 2005
SP2103	22 TDAFWP Once Every Refueling SD Flow Test	June 11, 2005
SP2234A	21 AFW Suction/Discharge Press Switches Calibration	February 16, 2004, May 25, 2005
E2105-AF-Q	Pre-Operational Test of Design Change 80Y129 U2	March 23, 1981

WORK DOCUMENTS

Number	Description/Title	Date/Revision
0200092	Replace PS-17700 and PS-17704 per EEC-1020	May 19, 2004
0200093	Replace PS-17776 and PS-17777 per EEC-1020	October 20, 2003
0200631	AFW Flow Channels Calibration	October 15, 2002
0210101	AFW Flow Channels Calibration	June 2, 2003
0211928	Conduct 3rd Int/3rd Period AF ISI Examination	September 22, 2003
0213190	Remove/Replace AF-29-1	September 26, 2004
0301630	SP1303 Flush	August 02, 2003
0301850	SP2303 22 AFWP Suction Quarterly Line Flush	July 26, 2003
0303330	SP1302 Flush	September 13, 2003
0303618	SP2302 21 AFWP Suction Quarterly Line Flush	September 6, 2003
0304653	SP1303 Flush	October 25, 2003
0304821	SP2303 22 AFWP Suction Quarterly Line Flush	October 18, 2003
0305212	SP1101 12 MDAFWP Once Every Refueling	November 24, 2004
0305213	SP1103 TS	December 6, 2002
0305496	Event Monitoring Instrument Calibration	December 12, 2003
0305549	SP1302 Flush	December 6, 2003
0305846	SP2302 21 AFWP Suction Quarterly Line Flush	November 29, 2003
0306126	SP1193 SD	November 29, 2002
0306409	Static Test for MOV MV-32025	----------
0306457	Perform D70 Inspection/Testing - MV-32017	September 25, 2004
0307165	AFW Flow Channels Calibration	August 3, 2004

WORK DOCUMENTS

Number	Description/Title	Date/Revision
0307785	SP1302 Flush	February 28, 2004
0307786	SP1303 Flush	January 17, 2004
0308124	SP2302 21 AFWP Suction Quarterly Line Flush	February21, 2004
0308125	SP2303 22 AFWP Suction Quarterly Line Flush	January 10, 2004
0308126	SP2303 22 AFWP Suction Quarterly Line Flush	March 31, 2004
0311187	SP1302 Flush	May 22, 2004
0311188	SP1303 Flush	April 10, 2004
0311189	SP1303 Flush	July 3, 2004
0311557	SP2302 21 AFWP Suction Quarterly Line Flush	May 15, 2004
0311558	SP2303 22 AFWP Suction Quarterly Line Flush	June 26, 2004
0402510	SP1302 Flush	August 14, 2004
0402650	SP2302 21 AFWP Suction Quarterly Line Flush	August 7, 2004
0402901	SP1303 Flush	October 20, 2004
0403019	SP2303 22 AFWP Suction Quarterly Line Flush	September 18, 2004
0403435	SP2302 21 AFWP Suction Quarterly Line Flush	October 30, 2004
0403648	SP1102 11 TDAFWP Monthly Test	January 3, 2005
0200238	SP1168.6 AFW System Operating Press Test	December 5, 2002
0208269	SP2193 Cycle AFWP and CL MOVs Each Cold SD	October 4, 2003
0208361	SP2101 21 MDAFWP Every Refuel SD Flow	March 2, 2002
0208362	SP2103 22 TD AFWP Once Every Refuel SD Flow	October 10, 2003
0211962	SP2168.6 AFW System Operating Press Test	June 5, 2000
0214047	SP1302 Flush	June 21, 2003
0214770	SP2302 21 AFWP Suction Quarterly Line Flush	June 14, 2003
0403790	SP1303 Flush	December 14, 2004
0403945	SP2100 21 MDAFWP Monthly Test	December 23, 2004
0403947	SP2102 22 TDAFWP Monthly Test	December 10, 2004
0404010	SP2303 22 AFWP Suction Quarterly Line Flush	December 11, 2004
0404631	CI/FP Pipe or CL HX Internal Inspection	May 25, 2005
0405011	21 MDAFWP Suction Piping Has High Bacteria Level	August 3, 2004
0405617	AFW Flow Channels Calibration	March 28, 2005
0407291	AFW Pipe Support Missing Load Flange	October 18, 2004
0407434	SP1100 12 MDAFWP Monthly Test	January 13, 2005
0407435	SP1102 11 TDAFWP Monthly Test	January 27, 2005
0407499	SP1302 Flush	January 29, 2005
0407577	SP2100 21 MDAFWP Monthly Test	January 19, 2005
0407578	SP2102 22 TDAFWP Monthly Test	January 7, 2005
0407611	SP2302 21 AFWP Suction Quarterly Line Flush	January 22, 2005
0408277	SP1100 12 MDAFWP Monthly Test	February 11, 2005
0408333	SP2102 22 TDAFWP Monthly Test	February 3, 2005
0408612	SP1102 11 TDAFWP Monthly Test	February 24, 2005

WORK DOCUMENTS

Number	Description/Title	Date/Revision
0408688	SP2100 21 MDAFWP Monthly Test	February 17, 2005
0409088	SP1100 12 MDAFWP Monthly Test	March 12, 2005
0409116	SP1303 Flush	March 12, 2005
0409150	SP2102 22 TDAFWP Monthly Test	March 2, 2005
0409167	SP2303 22 AFWP Suction Quarterly Line Flush	March 5, 2005
0409274	SP2100 21 MDAFWP Monthly Test	March 17, 2005
0409341	SP1100 12 MDAFWP Monthly Test	April 7, 2005
0409342	SP1102 11 TDAFWP Monthly Test	March 24, 2005
0409450	SP2102 22 TDAFWP Monthly Test	April 5, 2005
0409782	Remove/Rebuild/Replace 21 MDAFWP Main Oil Pump	January 19, 2005
0500054	SP1102 11 TDAFWP Monthly Test	April 21, 2005
0500105	SP1302 Flush	April 23, 2005
0500168	SP2100 21 MDAFWP Monthly Test	April 13, 2005
0500169	SP2102 22 TDAFWP Monthly Test	May 3, 2005
0500189	SP2302 21 AFWP Suction Quarterly Line Flush	April 17, 2005
0500336	SP1100 12 MDAFWP Monthly Test	May 4, 2005
0500337	SP1100 12 MDAFWP Monthly Test	June 2, 2005
0500338	SP1102 11 TDAFWP Monthly Test	May 19, 2005
0500459	SP1303 Flush	June 4, 2005
0500585	SP2100 21 MDAFWP Monthly Test	May 27, 2005
0501767	SP1101 12 MDAFWP Quarterly Flow and Valve Test	March 12, 2005
0501882	SP1101 12 MDAFWP Quarterly Flow and Valve Test	March 14, 2005
0501883	SP1101 12 MDAFWP Quarterly Flow and Valve Test	June 2, 2005
0503610	SP2193 Cycle AFWP and CL MOVs Each Cold SD	April 21, 2005
9708194	Take Bypass Flow Readings Using Scale	August 25, 1997
9708195	Take Bypass Flow Readings Using Scale	August 19, 1997
9708196	Take Bypass Flow Readings Using Scale	August 27, 1997
9708197	Take Bypass Flow Readings Using Scale	August 19, 1997
9904553	SP1168.6 AFW System Operating Press Test	October 16, 1996
MIC-U2-05 018	MIC Thickness Data Report	May 20, 2005
MIC-U2-05 015	MIC Thickness Data Report	May 21, 2005
MIC-U2-05 017	MIC Thickness Data Report	May 21, 2005
MIC-U2-05 011	MIC Thickness Data Report	May 19, 2005
NMC-PI1-3	ECI of AFWP Oil Cooler 11	October 12, 2004
NMC-PI2-10	ECI of AFWP Oil Cooler 21 and 22	May 25, 2005
PD04244.05	ECI Record for AFWP Lube Oil Coolers 11 and 12	0
PD04341.10	ECI Record for AFWP Lube Oil Coolers 21 and 22	0

LIST OF ACRONYMS USED

A/C	Air Conditioner
AC or ac	Alternating Current
ADAMS	Agency-wide Document Access and Management System
AFW	Auxiliary Feedwater
AOV	Air Operated Valve
App	Appendix
APS	Auxiliary Power System
CA	Corrective Action
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CHAMPS	Computerized History and Maintenance Planning System
CKT	Circuit
CLC	Component Level Calculation
CST	Condensate Storage Tank
CVCS	Chemical and Volume Control System
CW	Cooling Water
d/p	Differential Press
DB	Design Basis
DG	Diesel Generator
DPR	Demonstration Power Reactor
DRS	Division of Reactor Safety
ECI	Eddy Current Inspection
EDS	Engineering Design Standard
ENG	Engineering
EOP	Emergency Operating Procedure
EPRI	Electric Power Research Institute
EQ	Environmental Qualification
FW	Feedwater
HELB	High Energy Line Break
HX	Heat Exchanger
IMC	Inspection Manual Chapter
IR	Inspection Report
ISI	In-service Inspection
IST	In-service Testing
LLC	Limited Liability Company
LOOP	Loss of Offsite Power
MCC	Motor Control Center
MDAFWP	Motor Driven Auxiliary Feedwater Pump
ME	Mechanical Engineering
MEDP	Maximum Expected Differential Pressure
MIC	Microbiologically Induced Corrosion

LIST OF ACRONYMS USED

MSS	Main Steam System
NCV	Non-Cited Violation
NPSH	Net Positive Suction Head
NRC	Nuclear Regulatory Commission
NUREG	NRC Technical Report Designation
PARS	Publically Available Records System
PINGP	Prairie Island Nuclear Generating Plant
Press	Pressure
RG	Regulatory Guide
Rm	Room
RWST	Refueling Water Storage Tank
RSG	Replacement Steam Generator
S/D	Schematic Diagram
SD	Shutdown
SDP	Significance Determination Process
SER	Safety Evaluation Report
SG	Steam Generator
SI	Safety Injection
Spec	Specification
SV	Safety Valve
SWGR	Switchgear
TCN	Temporary Change Notice
TDAFWP	Turbine Driven Auxiliary Feedwater Pump
U	Unit
URI	Unresolved Item
USAR	Updated Safety Analysis Report
V	Volt
Vdc	Volts direct current
wpd	WordPerfect Document