

# Prairie Island 1

## 4Q/2008 Plant Inspection Findings

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### Initiating Events

**Significance:**  Dec 31, 2008

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **OPERATOR MANIPULATES INCORRECT COMPONENT DUE TO FAILURE TO FOLLOW PROCEDURES**

One self-revealed finding of very low safety significance and an associated NCV of Technical Specification (TS) 5.4.1 was identified on October 13, 2008, due to an operator's failure to follow procedures during refueling activities. The failure to follow procedures resulted in a loss of seal injection flow to the 11 reactor coolant pump due to the manipulation of a Unit 1 seal injection valve rather than a Unit 2 seal injection valve. Corrective actions for this issue included communicating this event to all Operations personnel, resetting the operations department's event free clock and providing additional training of the use of human performance tools.

The inspectors determined that this finding was more than minor because if left uncorrected, a continued failure to follow procedures could lead to the incorrect operation of additional plant equipment and become a more significant safety concern. The inspectors determined that this issue was of very low safety significance because the finding would not result in leakage that exceeded any TS limit and because the finding would not have affected other mitigation equipment. Specifically, the reactor coolant pumps were designed to be able to operate without seal injection flow for several hours as long as the component cooling water supply to the thermal barrier heat exchanger remained within allowable ranges. The inspectors concluded that this finding was cross cutting in the Human Performance, Decision Making area because the operator failed to use the systematic process for implementing procedures when deciding which valve needed to be manipulated.

Inspection Report# : [2008005](#) (*pdf*)

**Significance:**  Jun 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

#### **FAILURE TO TEST CHECK VALVE SI-9-5 UNDER SUITABLE ENVIRONMENTAL CONDITIONS**

Green. An inspector identified finding of very low safety significance and a Non Cited Violation of 10 CFR Part 50, Appendix B, Criterion XI, due to the licensee's failure to ensure Check Valve SI-9 5 was tested under suitable environmental conditions. Specifically, the licensee preconditioned SI 9 5 prior to testing by increasing reactor pressure and tapping on the valve with a hammer.

The inspectors determined that this finding was more than minor because it was associated with the equipment performance attribute of the initiating events cornerstone. The finding affected the cornerstone objective of limiting the frequency of those events that upset plant stability and challenge critical safety functions. The inspectors concluded that the finding was of very low safety significance because it was not a primary system loss of coolant accident or transient initiator. Additionally, the finding did not screen as potentially risk significant due to a fire, seismic, flooding, or severe weather initiating event. The inspectors concluded that this finding affected the corrective action program component of the Problem Identification and Resolution cross cutting area because the licensee failed to evaluate the cause of the 2008 SI 9 5 valve test failures to ensure that the resolution addressed the cause and extent of condition (P.1(c)). The corrective actions for this issue included restoring the valve to an operable but degraded condition, providing training on preconditioning, providing training on the use and implementation of the operability determination process, and improving the thorough evaluation of equipment related deficiencies.

Inspection Report# : [2008003](#) (*pdf*)

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# Mitigating Systems

**Significance:** **G** Dec 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

## **RESPIRATOR QUALIFICATION DEFICIENCY RESULTS IN NON-COMPLIANCE WITH 10 CFR PART 50, APPENDIX R**

The inspectors identified a finding of very low safety significance and an associated NCV of 10 CFR Part 50, Appendix R, Section J, on December 30, 2008, due to the licensee's failure to ensure that an alternate safe shutdown access path was provided with emergency lighting units that contained at least an 8-hour battery power supply. Corrective actions for this issue included ensuring that all personnel on shift were respirator qualified so that alternate safe shutdown access pathways would not need to be used.

The inspectors determined that this issue was more than minor because if left uncorrected, the failure to properly evaluate alternative safe shutdown access paths against regulatory requirements could become a more significant safety concern due to its potential impact on safely shutting down the plant following a fire. The inspectors determined that this finding was of very low safety significance due to its low exposure time and low degradation rating. The inspectors concluded that this finding was cross-cutting in the Human Performance, Decision Making area because the licensee failed to make this safety-significant/risk-significant decision using a systematic process that included a review of the safe shutdown analysis timeline and input from fire protection personnel.

Inspection Report# : [2008005](#) (*pdf*)

**Significance:** **SL-IV** Dec 12, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

## **Failure to Perform a 50.59 Evaluation for Bulk Hydrogen Storage Facility**

Severity Level IV. The inspectors identified a Severity Level IV NCV, having very low safety significance, of 10 CFR 50.59, "Changes, Tests, and Experiments," for the licensee's failure to perform a safety evaluation associated with installation of a bulk hydrogen storage facility. Specifically, the licensee had not evaluated the adverse affects on the Circulating Water System from a postulated hydrogen tank explosion in the bulk storage facility located directly above buried Circulating Water System return lines. The licensee stopped work on the installation of the bulk hydrogen facility and documented the NRC identified issues in the corrective action system. The inspectors' concerns also prompted the licensee to identify above ground Cooling Water System pipe in the nearby Turbine Building which had not been evaluated in the hydrogen blast analysis.

The finding was more than minor because the inspectors could not reasonably determine that this change would not have ultimately required prior approval from the NRC. This finding was categorized as Severity Level IV because the underlying technical issue for the finding was determined to be of very low safety significance based on a Phase 1 screening in accordance with IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situation." Specifically, the inspectors answered "No" to the Mitigating Systems screening questions in the Phase 1 Screening Worksheet because the licensee had not yet filled the bulk storage facility with hydrogen, so no possibility of explosion and damage to plant equipment existed. The cause of the finding is related to the cross-cutting element of Human Performance, Decision Making, because the licensee failed to make conservative assumptions in decision making associated with the effects of a postulated hydrogen tank explosion (IMC 305, Section 06.07.c, Item H.1(b)).

Inspection Report# : [2008007](#) (*pdf*)

**Significance:** **W** Oct 06, 2008

Identified By: Self-Revealing

Item Type: VIO Violation

## **11 TURBINE-DRIVEN AUXILIARY FEEDWATER PUMP INOPERABLE DUE TO FAILURE TO CONTROL POSITION OF VALVE THAT COULD ISOLATE THE DISCHARGE PRESSURE SWITCH**

A self-revealing apparent violation of Technical Specifications was associated with the licensee's failure to adequately control the position of a valve that could isolate the 11 TDAFWP's discharge pressure switch. Because of the valve

being closed, the 11 TDAFWP failed to run as required, subsequent to a reactor trip. The manifold isolation valve was determined to have been shut for 138 days, rendering the 11 TDAFWP inoperable for a time period that significantly exceeded the Technical Specification allowed outage time for the pump. This issue has potential safety significance greater than very low safety significance for Unit 1, which may change pending completion of the SDP. This issue was entered into the licensee's corrective action program (CAP 01146005). The licensee took prompt corrective actions to restore the mispositioned valve to its normal (open) position; perform valve lineups to verify correct equipment configurations for the remaining auxiliary feedwater pumps; and perform appropriate surveillance testing on the 11 TDAFWP to verify the component's operable status.

This finding was determined to be more than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," because it impacted the configuration control attribute of the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of the systems that respond to initiating events to prevent undesirable consequences. The cause of this finding was related to the cross-cutting element of human performance for resources (H.2.(c)). (Section 40A3.3)

Final significance determination letter issued 1/27/2009 as a White.

Inspection Report# : [2008008](#) (*pdf*)

**Significance:**  Sep 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

#### **LOAD SEQUENCER TEST PROCEDURE CONFLICTS WITH VENDOR MANUAL INFORMATION**

The inspectors identified a finding of very low safety significance and associated NCV of 10 CFR 50, Appendix B, Criterion V for the failure to ensure that the surveillance procedures used to test the safety related load sequencers included appropriate qualitative acceptance criteria. Specifically, the acceptance criteria specified in the procedure conflicted with vendor manual information and was less conservative. Corrective actions for this issue included revising the surveillance procedures to include the vendor manual information and implementing a comprehensive preventive maintenance program to improve the availability and reliability of the load sequencers.

This finding was more than minor because it was associated with the procedure quality and equipment performance attributes of the Mitigating Systems Cornerstone. In addition, the finding affected the cornerstone objective of ensuring the availability and reliability of equipment to respond to initiating events to prevent undesirable consequences. The inspectors determined that this finding was of very low safety significance because it was not a design issue resulting in loss of operability or functionality, it did not result in a loss of safety function, it did not result in loss of safety function for a single train for greater than the allowed outage time, and it did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors determined that this finding was cross cutting in the Human Performance, Decision Making area because the licensee failed to use conservative assumptions during the February 2007 decision that led to making the load sequencer surveillance procedure non-conservative (H.1(b)).

Inspection Report# : [2008004](#) (*pdf*)

**Significance:**  Sep 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

#### **11 TURBINE-DRIVEN AUXILIARY FEEDWATER PUMP INOPERABLE DUE TO IMPROPERLY INSTALLED INSULATION**

The inspectors identified an apparent violation (AV) of Technical Specification 5.4.1 for the failure to establish, implement and maintain procedures governing the installation of insulation on the 11 turbine-driven auxiliary feedwater (TDAFW) pump. The failure to establish and implement adequate instructions resulted in the 11 TDAFW pump being inoperable for 10 days due to improper insulation installation during the March 2008, Unit 1 refueling outage. This issue has the potential to have low to moderate safety significance; however, this may change pending the completion of the SDP. Corrective actions for this issue included correctly installing the insulation, exploring the installation of a different insulation package that was easier to install, and performing an internal inspection to

determine if mechanical clearances inside the turbine were contributing to the increased turbine bearing temperatures.

This finding was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the 11 TDAFW pump would not have been able to perform its safety function during the worst case, post accident conditions. This finding was not an immediate safety concern because the licensee took immediate action to declare the pump inoperable once the condition of the insulation was identified. The inspectors determined that this finding was cross cutting with respect to the Decision Making aspect of the Human Performance area because the licensee failed to use conservative assumptions when determining the need to establish and implement instructions for installing the turbine insulation (H.1(b)).

Final Significance Determination letter issued 1/27/2009 as a Green.

Inspection Report# : [2008004](#) (*pdf*)

Inspection Report# : [2008010](#) (*pdf*)

**Significance:**  Jul 09, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

**This is a security Related Finding - see inspection report for details.**

This finding, affecting the Mitigating Systems Cornerstone, is related to mitigative measures developed to cope with losses of large areas of the plant; in response to Section B.5.b of the February 25, 2002, Interim Compensatory Measures (ICM) Order (EA-02-026) and related NRC guidance. This finding has been designated as "Official Use Only - Security-Related Information": therefore, the details of this finding are being withheld from public disclosure. This finding has a cross-cutting aspect in the area of Human Performance - Facilities & Equipment. See inspection report for more details.

Inspection Report# : [2008006](#) (*pdf*)

**Significance:** SL-IV Jun 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

**USAR NOT UPDATED TO INCLUDE ANALYSES**

Severity Level IV. The inspectors identified a Non-Cited Violation of 10 CFR 50.71, "Maintenance of records, making of reports," for the licensee's failure to adequately update the Prairie Island Nuclear Generating Plant Updated Safety Analysis Report (USAR) to include analyses performed in response to Generic Letter (GL) 2004-02. Title 10 CFR 50.71(e) requires, in part, that the USAR be revised to include the effects of all analyses of new safety issues performed by or on behalf of the licensee at Commission request. The Commission, through GL 2004-02, requested that licensees perform an evaluation of the Emergency Core Cooling Systems and its associated recirculation functions and, if appropriate, take additional actions to ensure system function. The licensee, in response to GL 2004-02, performed analyses of debris generation and transport, chemical effects, downstream effects, upstream effects, and strainer and other structural analysis, but did not update the safety analysis report to include those analyses.

This issue potentially impacted the NRC's ability to perform its regulatory function and therefore, it was evaluated using the traditional enforcement process. The inspectors determined that the finding was more than minor because of the potential to impact the regulatory process by using IMC 0612, Appendix B, "Issue Screening," dated September 20, 2007. Specifically, the failure to provide complete licensing and design basis information in the USAR could result in either the licensee making an inappropriate interpretation or the NRC making an inappropriate regulatory decision based on incomplete information in the USAR. This finding has a cross-cutting aspect in the area of human performance, work practices (H.4(c)) because the licensee did not ensure supervisory and management oversight of work activities such that nuclear safety was supported. Corrective actions included revising the USAR to reflect the analyses and submitting the updated information to the NRC.

Inspection Report# : [2008003](#) (*pdf*)

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# Barrier Integrity

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## Emergency Preparedness

**Significance:**  Sep 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

### **FAILURE TO MAINTAIN STAFF RESPIRATORY QUALIFICATIONS INCLUDING PERSONNEL QUALIFICATIONS NECESSARY FOR EMERGENCY RESPONSE DUTIES AS REQUIRED BY STATION PROCEDURES**

The inspectors identified a finding of very low safety significance and associated NCV of 10 CFR 50.54(q) for the failure to maintain staff respiratory qualifications, including personnel qualifications necessary for emergency response duties, as required by station procedures. Specifically, the inspectors identified multiple instances over the last several years where station personnel, including those required to maintain their respiratory readiness necessary for emergency response functions, failed to maintain their qualifications current. The most recent instances being a fire brigade member standing duty without the necessary respiratory fit test and a reactor operator standing duty without the necessary respiratory protection training. Planned corrective actions included periodic reviews to identify respiratory protection qualification issues prior to expiration to ensure that impacted departments maintained compliance with station procedures until the next scheduled periodic review.

The issue was more than minor because it was chronic in nature and associated with the facilities/equipment attribute of the Emergency Preparedness Cornerstone. The inspectors determined that the issue affected the cornerstone objective to ensure adequate protection of plant emergency workers (and consequently the health and safety of the public in the event of a radiological emergency) should the workers be called upon to use the equipment. Since the finding did not represent a functional failure of the Planning Standard, and the workers who were required to use respiratory protective equipment were not qualified and/or trained to use that equipment, the finding was determined to be of very low safety significance (Green). The inspectors determined that this finding was cross-cutting in the area of Problem Identification and Resolution because the licensee failed to take appropriate corrective actions once the issue was identified (P.1(d)).

Inspection Report# : [2008004](#) (*pdf*)

**Significance:**  Mar 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

### **TSC VENTILATION ISSUES RESULTED IN INADEQUATE EMERGENCY RESPONSE FACILITY**

Green. The inspectors identified a NCV of 10 CFR 50.54(q), associated with 10 CFR 50.47(b)(8), for failing to maintain adequate emergency facilities to support emergency response. Specifically, the licensee failed to maintain control of the Technical Support Center ventilation system. As a result, the system was frequently found to be in a degraded condition that may not have provided adequate protection for emergency response personnel.

This finding was more than minor because it was associated with the attribute of meeting the planning standards of 10 CFR 50.47(b). In addition, the finding affected the cornerstone objective of ensuring that the licensee was capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. In accordance with the SDP Phase 1 Screening Worksheet of IMC 0609, the inspectors applied Appendix B, "Emergency Preparedness Significance Determination Process," Section 4.8 and determined that this issue was of very low safety significance. Specifically, the Technical Support Center ventilation system was degraded for a period of longer than seven days from the time of original discovery. In addition, the degradation was to the extent that key emergency response organization members may not have been able to perform their assigned plan functions without compensatory measures. The finding was determined to be cross cutting in the corrective action program aspect of the Problem Identification and Resolution cross-cutting area because the licensee failed to thoroughly evaluate repeated

problems with the Technical Support Center ventilation system such that the causes of the problems were identified and addressed (P.1(c)).

Inspection Report# : [2008002](#) (*pdf*)

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## Occupational Radiation Safety

**Significance:**  Mar 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

### **WORKER NOT IN COMPLIANCE WITH TS 5.7.1 B RECEIVED AN ED DOSE-RATE ALARM WHEN HE INAPPROPRIATELY ENTERED A HRA OF THE PLANT DURING STEAM GENERATOR SET-UP WORK**

Green. A self-revealing finding of very low safety significance and an associated NCV were identified for the licensee's failure to comply with Technical Specification 5.7.1.b for access control to high radiation areas of the plant. As a result of poor human performance, a contract radiation worker received an electronic dosimeter high dose-rate alarm while performing steam generator set-up activities, when he inappropriately entered a high radiation area of the plant on a non-high radiation area radiation work permit. As corrective actions, the licensee provided additional training to the individuals involved and reinforced the expectations for high radiation area access control.

The finding was more than minor because it was associated with the Program/Process attribute of the Occupational Radiation Safety Cornerstone and potentially affected the cornerstone objective to ensure adequate protection of worker health and safety from exposure to radiation, in that the failure to implement controls for high radiation area entry may result in unplanned dose. The finding was determined to be of very low safety significance because the finding did not involve As-Low-As-Is-Reasonably-Achievable (ALARA) planning; it did not involve an overexposure; there was not a substantial potential for a worker overexposure; and the licensee's ability to assess worker dose was not compromised. The cause of the finding is related to a cross-cutting aspect of human performance in work control (H.3(b)).

Inspection Report# : [2008002](#) (*pdf*)

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## Public Radiation Safety

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## Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the [cover letters](#) to security inspection reports may be viewed.

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## Miscellaneous

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