

# Prairie Island 1

## 1Q/2009 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:**  Mar 31, 2009

Identified By: NRC

Item Type: FIN Finding

## **FAILURE TO PROTECT FIRE PROTECTION EQUIPMENT FROM EFFECTS OF EXTREME COLD TEMPERATURES**

The inspectors identified a finding of very low safety significance on January 13, 2009, due to the fire protection system pumps being unable to auto start, as designed, in response to a low fire header pressure condition. Corrective actions for this issue included unthawing the sensing line, verifying the screenhouse ventilation system's configuration, revising the normal screenhouse ventilation procedure to ensure that it provided guidance on shutting down the exhaust fans, and repairing several normal screenhouse ventilation system equipment deficiencies.

This finding was more than minor because if left uncorrected, the failure to protect mitigating systems equipment from the effects of extreme cold temperatures could result in the system failing to function when needed. The inspectors determined that this finding was of very low safety significance because it was assigned a low fire degradation rating as specified in the Fire Protection Significance Determination Process. This finding was determined to be cross-cutting in the Human Performance, Resources area because the licensee failed to have a complete and accurate normal screenhouse ventilation procedure to ensure that operation of the system would not result in the freezing of mitigating systems equipment during extreme cold weather conditions (H.2(c)). No violations of NRC requirements occurred because the fire pumps could have been started manually if needed and because the normal screenhouse ventilation system was nonsafety-related.

Inspection Report# : [2009002](#) (*pdf*)

**Significance:**  Mar 31, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

## **FAILURE TO FOLLOW PROCEDURES DURING PERFORMANCE OF OPERABILITY EVALUATIONS**

The inspectors identified a finding of very low safety significance and a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to adequately implement Procedure FP-OP OL-01, "Operability Determination", to assess the capability of the 122 Control Room Chilled Water Pump to meet its mission time following the discovery of increased pump vibrations. Corrective actions for this issue included revising the operability recommendation and repairing the degraded pump.

This finding was more than minor because, if left uncorrected, failure to adequately implement the operability procedure could result in safety-related components been incorrectly declared operable rather than inoperable or operable, but non-conforming (a more significant safety concern). This finding was of very low safety significance because the finding did not represent an actual loss of safety function of a single train for longer than its Technical Specification allowed outage time. The inspectors concluded that this finding was cross-cutting in the Human Performance, Decision Making area because the licensee failed to validate the underlying assumptions made when determining the continued operability of a safety-related component (H.1(b)).

Inspection Report# : [2009002](#) (*pdf*)

**Significance:**  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

**Significance:**  Mar 31, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

**FAILURE TO ADHERE TO LICENSED POWER LEVEL SPECIFIED IN OPERATING LICENSE**

A self-revealed finding and Non-Cited Violation of Prairie Island Nuclear Generating Plant Operating License DPR 42, Section C.1, was identified on January 2, 2009, due to the failure to maintain Unit 1 reactor power below the thermal power limitations stated in the facility operating license. Corrective actions for this issue included revising all associated operating procedures to ensure that operations personnel take action to lower reactor power if power levels

exceed the licensed thermal power limitations.

The inspectors determined that this issue was more than minor because if left uncorrected the operation of the reactor beyond the limits specified in the operating license could become a more significant safety concern. The inspectors determined that this issue was of very low safety significance because the finding was only associated with the fuel aspect of the Barrier Integrity Cornerstone and no core thermal limits were violated. The inspectors determined that this finding was cross-cutting in the Human Performance, Resources area because the licensee failed to have complete, accurate and up-to-date procedures regarding the maintenance of licensed thermal power levels (H.2(c)).

Inspection Report# : [2009002](#) (*pdf*)

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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*)

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## Occupational Radiation Safety

**Significance:**  Jan 21, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Perform Formal Job Planning to Evaluate the Radiological Hazards**

An NRC-identified finding of very low safety significance with an associated Non-Cited Violation (NCV) of Technical Specification 5.4.1 was identified in the area of occupational radiation safety associated with the licensee's

failure to perform adequate job planning to evaluate the radiological hazards, as required by station procedures. Specifically, the licensee failed to properly assess the radiological hazards to workers associated with the decontamination, demobilization and packaging of fuel sipping equipment on the refuel floor. This issue has been entered into the licensee's corrective action program and implemented corrective actions that include changes to procedures to include a holistic risk-based review of radiologically significant work.

The finding is more than minor because, given the radiological uncertainty of working with fuel handling equipment, if left uncorrected the finding could become a more significant safety concern. The finding was determined to be of very low safety significance because it did not involve unintended collective dose (ALARA planning); there was no overexposure, nor potential for overexposure; and the licensee's ability to assess dose was not compromised. Additionally, the cause of this finding had a cross-cutting aspect in the area of Human Performance. Specifically, the licensee failed to appropriately plan the work activity by incorporating risk insights and job site conditions, including conditions which may impact radiological safety (H.3 (a)).

Inspection Report# : [2008009](#) (*pdf*)

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## Public Radiation Safety

**Significance:** **W** Jan 21, 2009

Identified By: NRC

Item Type: VIO Violation

### **Radioactive Material Shipment Package radiation Levels Exceeded**

A self-revealing finding with an apparent violation of regulatory requirements was identified involving a failure of the licensee to properly radiologically characterize, prepare, and ship a package containing radioactive material in a manner that assured, under conditions normally incident to transport, conformance with Department of Transportation (DOT) radiation level limitations specified by 49 CFR 173.441(a), (i.e., 200 millirem per hour (mrem/h)) on any external surface of the package as required by 10 CFR 71.5 [and 49 CFR 173.441(a)]. Additionally, the licensee did not provide nor ensure that the individuals involved in preparing this shipment were trained and qualified for the task as specified by 49 CFR 172.704, "Training Requirements." The finding involved an October 29, 2008, radioactive material shipment, via an exclusive-use open transport vehicle that was determined to have radiation levels of 1630 mrem/h on the external surface of a package upon receipt at the shipping destination. As immediate corrective actions, the licensee suspended all radioactive shipment activities. The licensee entered this performance deficiency in their corrective action program; initiated a root cause evaluation; and initiated corrective measures, including various process improvements to prevent recurrence.

This finding is more than minor since it was associated with the Public Radiation Safety Cornerstone program and process attribute and affected the cornerstone objective to ensure adequate protection of the public from exposure to radioactive materials given that package radiation levels were elevated. Preliminarily, the significance of this finding is considered as having a substantial safety significance (Yellow), since the radiation level was greater than five times the limit (1000 mrem/h) but less than ten times the limit (2000 mrem/h) specified by the DOT regulatory requirement. Although the surface of the package with elevated radiation levels would not be routinely accessible to a member of the public during transport, that aspect was fortuitous and not the result of design nor package preparation by the licensee. The condition had the potential to adversely affect personnel who would normally receive the package or respond to an incident involving the package, with a reasonable expectation that the package conformed to DOT radiation limitations.

Additionally, the cause of this finding had a cross-cutting aspect in the area of Human Performance. Specifically, the licensee failed to appropriately plan the work activity by incorporating risk insights and job site conditions, including conditions which may impact radiological safety (H.3 (a)). This finding is documented within the licensee's corrective action system as RCE 1157726.

Final determination letter issued May 6, 2009.

Inspection Report# : [2008009](#) (*pdf*)

Inspection Report# : [2009008](#) (*pdf*)

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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

Last modified : May 28, 2009