

# Prairie Island 2

## 1Q/2008 Plant Inspection Findings

---

### Initiating Events

**Significance:**  Jun 30, 2007

Identified By: NRC

Item Type: FIN Finding

#### **FAILURE TO MAINTAIN SAFETY INJECTION RELAYS**

Green. A finding of very low safety significance was self-revealed when a Unit 2 train A safeguards actuation and reactor trip occurred during the performance of the safeguards logic test at power. The actuation occurred because of a failure of the actuation relay to reset. The relay did not reset because of high electrical resistance across the relay contacts due to an oxide layer that accumulated through time. The oxide layer was due to a failure to perform periodic preventive maintenance on the reset contacts as recommended by the manufacturer and failure to periodically replace the relays as recommended by industry guidance. The licensee has entered this finding into the corrective action program. The immediate corrective actions were to replace the Unit 2 train A safeguards relays with new ones and to revise the logic test procedures to keep the relays in the test mode until the reset is verified. The procedure enhancement would not be required if the reset functioned as designed. Planned actions to prevent recurrence included replacement of all similar relays during the next refueling outage and implementation of a preventive maintenance optimization project.

This finding was greater than minor significance because it was associated with the Initiating Events cornerstone attribute of "Equipment Performance," and affected the cornerstone objective to limit those events which upset plant stability and challenge critical safety functions during shutdown as well as power operations. The finding was determined to be of very low safety significance because it did not contribute to the likelihood that mitigation equipment or functions would be unavailable. No violation of NRC requirements occurred. The cause for the finding affected the cross-cutting area of problem identification and resolution in the operating experience aspect because the licensee did not effectively use internally generated lessons learned and vendor recommendations to institutionalize changes to the station preventive maintenance process (P.2(b)).

Inspection Report# : [2007003](#) (*pdf*)

---

### Mitigating Systems

**Significance:**  Jun 22, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Inadequate Modification of Safeguards Screenhouse Ventilation System**

The inspectors identified a finding having very low significance (Green) and an associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control." Specifically, the licensee modified the safeguards screenhouse ventilation system by removing four fans and failed to verify or test the adequacy of the remaining ventilation exhaust fans to cool the safety-related cooling water pumps. Following discovery, the licensee entered the issue into its corrective action program, performed additional tests and calculations and revised the maximum allowable outside air temperature. There was not a cross-cutting aspect to this violation.

This issue was more than minor because it met the criteria in IMC 0612, Appendix E, "Examples of Minor Issues," Example 3j for making an issue more than minor. Specifically, without the evaluations and subsequent imposition of a new maximum outside temperature procedure limit, the inspectors had reasonable doubt that the diesel driven cooling water pumps would reliably perform their safety related function under adverse temperature conditions. The issue was 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 Situations.

Inspection Report# : [2007007](#) (*pdf*)

**Significance:**  Jun 22, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Overload Heater Sizing for Safeguards Screenhouse Ventilation Exhaust Fan**

The inspectors identified a finding having very low significance and an associated non cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control." Specifically, the licensee failed to ensure that the thermal overload heater for the 21 screenhouse safeguards roof exhaust fan had sufficient margin to allow proper operation under adverse conditions. Following discovery, the licensee entered the issue into its corrective action program, took actual running current measurements and performed preliminary calculations to justify operability. There was not a cross-cutting aspect to this violation.

This issue was more than minor in accordance with IMC 0612, Appendix B, "Issue Disposition Screening," because, at the time of discovery, there was reasonable doubt on the operability of fan 21. Specifically, because of the errors in setting and testing the 21 screenhouse safeguards roof exhaust fan thermal overload heater, actual field measurements and further evaluation needed to be performed in order to demonstrate that the overload heater could perform its safety function during a design basis event. The issue was 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 Situations.

Inspection Report# : [2007007](#) (*pdf*)

**Significance:**  Jun 22, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

### **Non-Conservative Inputs for Motor-Operated Valve Calculations**

The inspectors identified a finding having very low significance (Green) and an associated non cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control." Specifically, the licensee used non-conservative inputs or methodologies in calculating terminal voltages or control circuit voltages to safety-related MOV motors that would be required to operate for mitigation of design bases events. Following discovery, the licensee redid a number of calculations to demonstrate MOV operability, performed an informal bounding analysis to verify that the inputs to the calculations were conservative and entered the issue into its corrective action program. There was not a cross-cutting aspect to this violation.

This issue was more than minor because it met the criteria in IMC 0612, Appendix E, "Examples of Minor Issues," Example 3j for making an issue more than minor. Specifically, the use of non-conservative values of motor control center voltages or starting current to calculate MOV terminal voltages or control circuit voltages to safety-related MOVs, combined with the fact that the electrical voltage analyses had not been updated for a significant period of time to reflect plant modifications, and the omission of the cooling water crossover valve, with its required safety function to close during a design bases event resulted in a condition where there was reasonable doubt on the operability of the components. Both the electrical voltage calculations and mechanical thrust and torque calculations had to be re-evaluated to determine operability of the affected safety-related MOVs. The issue was 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 Situations.

Inspection Report# : [2007007](#) (*pdf*)

---

## **Barrier Integrity**

---

## **Emergency Preparedness**

**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)

---

## 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)

**Significance:**  Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

### **INADEQUATE IMPLEMENTATION OF VHRA CONTROLS FOR THE C-SUMP IN U1R24**

Green. A finding of very low safety significance and an associated Non-Cited Violation (NCV) was inspector-identified for the licensee's failure to adequately maintain sufficient controls over a posted very high radiation area (VHRA) during the spring 2006 Unit-1 refuel outage (U1R24) contrary to 10 CFR 20.1602 and station procedural

requirements. Specifically, the licensee failed to maintain appropriate control of the C-sump (i.e., the thimble tube chase). The licensee has entered the issue into the corrective action program. Licensee corrective actions included reinforcing expectations for procedural compliance and revising the procedures to require the written permission of the plant manager for VHRA key issue.

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. 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, collective dose was not a factor, 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 in the area of Human Performance associated with the aspect of work practices in procedural compliance (H.4.b).

Inspection Report# : [2007005](#) (pdf)

**Significance:**  Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

#### **INADEQUATE CONTROL OF VHRA KEYS IN U2R24**

Green. A finding of very low safety significance and an associated NCV of Technical Specification 5.4.1 was inspector-identified for the licensee's failure to adequately implement radiation safety procedures concerning the 2006 Unit-2 refueling outage when the C-sump VHRA key was signed out by radiation protection (RP) supervision and possession of the key was transferred between individuals over multiple shifts. The licensee has entered the issue into the corrective action program. Licensee corrective actions for this issue included reinforcing expectations for procedural compliance and revising the procedures to ensure that the VHRA keys are maintained in the control of RP supervision, that possession is not transferred between personnel, and that VHRA keys are checked back in at the end of each shift.

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. The finding was determined to be of very low safety significance because the finding did not involve ALARA planning, collective dose was not a factor, 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 the cross-cutting area of Problem Identification and Resolution associated with the aspect of corrective action program specifically that the licensee takes appropriate corrective actions to address safety issues, commensurate with their significance (P.1.d).

Inspection Report# : [2007005](#) (pdf)

**Significance:**  Jun 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

#### **CONTINUE TO PERMIT UNIT 2 CONTAINMENT ACCESS ON RADIATION WORK PERMITS THAT DO NOT AUTHORIZE ACCESS TO AIRBORNE RADIOACTIVITY LEVELS**

Green. A finding of very low safety significance and two associated Non-Cited Violations were inspector-identified associated with the licensee's failure to adequately implement radiation safety procedures concerning the control and response to airborne radiological conditions in containment during the Unit 2 refueling outage (U2R24). After airborne radiological conditions were identified, station personnel continued to access the Unit 2 containment on radiation work permits that did not allow work in a posted airborne radioactivity area. Additionally, once elevated airborne radiation conditions were detected, all personnel were not evacuated from the area, as required by station procedures. The licensee entered the issue into the corrective action program. Licensee corrective actions for this issue included changes to outage planning and scheduling activities to minimize the likelihood of creating airborne conditions in containment and reinforcing the necessity for procedural compliance.

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. The finding was determined to be of very low safety significance because the finding did not involve As-Low-As-Reasonably-Achievable planning, collective dose was not a factor, 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 in the area of human performance in work practices. Specifically, human performance work practices require that the licensee define and effectively communicate expectations regarding procedural compliance and that personnel follow procedures (H.4(b)).

Inspection Report# : [2007003](#) (*pdf*)

**Significance:**  Jun 30, 2007  
Identified By: NRC

Item Type: NCV NonCited Violation

### **FAILURE TO EVACUATE UNIT 2 CONTAINMENT UPON DETECTION OF ELEVATED AIRBORNE RADIOACTIVITY LEVELS**

Green. A finding of very low safety significance and two associated NCVs were identified by the inspectors. Specifically, the licensee failed to adequately implement radiation safety procedures concerning the control and response to airborne radiological conditions in containment during the Unit 2 refueling outage (U2R24). After airborne radiological conditions were identified, station personnel continued to access the Unit 2 containment on radiation work permits that did not allow work in a posted airborne radioactivity area. Additionally, once elevated airborne radiation conditions were detected, all personnel were not evacuated from the area as required by station procedures. The licensee entered the issue into the corrective action program. Licensee corrective actions for this issue included changes to outage planning and scheduling activities to minimize the likelihood of creating airborne conditions in containment and reinforcing the necessity for procedural compliance.

The finding was more than minor because it was associated with the Program/Process attribute of the Occupational Radiation Safety cornerstone and affected the cornerstone objective to ensure adequate protection of worker health and safety from exposure to radiation. The finding was determined to be of very low safety significance, using the significance determination process, because the finding did not involve As-Low-As-Reasonably-Achievable planning, collective dose as a factor, an overexposure, a substantial potential for a worker overexposure, and any level of compromise of the licensee's ability to assess worker dose. The cause of the finding is related to a cross-cutting aspect in the area of human performance in work practices. Specifically, the licensee did not effectively follow procedures and communicate expectations regarding procedural compliance and follow procedures (H.4(b)).

Inspection Report# : [2007003](#) (*pdf*)

---

## **Public Radiation Safety**

---

## **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.

---

## **Miscellaneous**

Last modified : June 05, 2008