

# Prairie Island 2

## 1Q/2011 Plant Inspection Findings

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### Initiating Events

**Significance:**  Jun 30, 2010

Identified By: Self-Revealing

Item Type: FIN Finding

#### **FAILURE TO ADDRESS DESIGN VULNERABILITY RESULTS IN REACTOR TRIP**

A self revealed finding of very low safety significance was identified following an automatic reactor trip on April 16, 2010. Specifically, the licensee failed to appropriately establish and implement actions to correct the causes of a turbine trip/reactor trip in 2001 and a turbine trip in 2003 even though the actions were required by the corrective action procedure in use at the time of the event. The failure to appropriately establish and implement actions to correct the causes of the previous events resulted in creating a large difference in Unit 2 condenser pressures while operating at lower power levels and a subsequent turbine trip/reactor trip. Corrective actions for this issue included correcting system deficiencies which led to the large difference in condenser pressures and improving procedural guidance regarding the sealing steam system.

The inspectors determined that this issue was more than minor because it was associated with the design control, configuration control and procedure quality attributes of the Initiating Events Cornerstone and impacted the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. This finding was determined to be of very low safety significance because it did not contribute to a reactor trip with mitigating equipment not available. No cross cutting aspect was assigned to this finding because the decisions made in regard to the 2001 and 2003 actions were made more than 2 years ago. No violation of NRC requirements was identified because the system deficiencies that contributed to the turbine trip/reactor trip were associated with non safety related systems. (Section 40A3.7)

Inspection Report# : [2010003](#) (*pdf*)

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### Mitigating Systems

**Significance:**  Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

#### **FAILURE TO APPROPRIATELY COMPLETE AN OPERABILITY DETERMINATION ON D5 EMERGENCY DIESEL GENERATOR (EDG).**

The inspectors identified a finding of very low safety significance and an NCV of 10 CFR Part 50, Appendix B, Criterion V, on November 12, 2010, due to the failure to complete an immediate operability determination for the D5 EDG in accordance with Procedure FP OP-OL-01, "Operability/Functionality Determination." Specifically, operations personnel failed to properly assess the impact of a malfunctioning fuel oil transfer system on the ability of the D5 EDG to perform its safety function as required by the procedure. Corrective actions for this issue included declaring the D5 EDG inoperable; repairing the fuel oil transfer system equipment deficiency; satisfactorily testing the D5 EDG following the equipment repairs; providing additional training on the operability process to operations personnel; and implementing a daily management review of operability decisions.

The inspectors determined that this issue was more than minor because it was associated with the human performance, procedure quality, and configuration control attributes of the Mitigating Systems Cornerstone. This finding also impacted the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined that this finding was of very low safety significance because, although this potential design deficiency resulted in a loss of D5 EDG operability, it did not result in D5 inoperability for greater than TS allowed time, did not result in a loss of safety function for the Unit 2 EDGs and it did not screen as potentially risk significant due to a seismic, flooding or severe weather initiating event.

The inspectors concluded that this finding was cross-cutting in the Problem Identification and Resolution, Corrective Action Program area because the licensee had not taken appropriate corrective actions to address a previously identified adverse trend regarding the adequacy of operability determinations (P.1(d)).

Inspection Report# : [2010005](#) (pdf)

**Significance:**  Dec 31, 2010

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**FAILURE TO INCLUDE 121 MOTOR DRIVEN COOLING WATER PUMP (MDCLP) COUPLING HARDNESS INFORMATION IN PROCUREMENT DOCUMENT.**

A self-revealed finding of very low safety significance and an NCV of 10 CFR Part 50, Appendix B, Criterion IV, was identified on July 25, 2010, due to the licensee's failure to specify the required 121 motor driven cooling water pump shaft coupling hardness as part of the procurement process. As a result, the pump was rendered unavailable due to a shaft coupling failure due to excessive hardness of the shaft. Corrective actions for this issue included repairing the cooling water pump and revising the procurement documents to include the required coupling hardness.

The inspectors determined that this issue was more than minor because it impacted the design control attribute of the Mitigating Systems Cornerstone. This finding also impacted the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors completed the Phase 1 and Phase 2 SDP evaluations and determined that a Phase 3 evaluation was required due to this issue being potentially greater than green. The Region III SRA determined that this finding was of very low safety significance because it did not represent an increase in the likelihood of a loss of cooling water initiating event due to different couplings being installed on the other cooling water pumps. The inspectors determined that this finding was cross-cutting in the Problem Identification and Resolution, Corrective Action Program area because the licensee did not use operating experience to support plant safety. Specifically, the licensee did not implement changes to the 121 motor driven cooling water pump after receiving and reviewing multiple pieces of operating experience regarding coupling failures due to hardness issues (P.2(b)).

Inspection Report# : [2010005](#) (pdf)

**Significance:** SL-IV Nov 05, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

**INADEQUATE 50.59 EVALUATION FOR NEW MANUAL OPERATOR ACTIONS.**

A Severity Level IV NCV of 10 CFR 50.59(d)(1), "Changes, Tests, and Experiments," was identified by the inspector for the licensee's failure to provide an evaluation that adequately documented why implementing new manual operator actions during periods of adverse weather, which isolated portions of the component cooling water system susceptible to hazards associated with tornado-generated missiles, did not present a more than minimal increase in the likelihood of occurrence of a malfunction of a structure, system or component (SSC) important to safety previously evaluated in the updated safety analysis report (USAR). The licensee initiated CAP 1257118, "50.59 Screening Not Sufficient – 122 Spent Fuel Pool Heat Exchanger Component Cooling Loss," and, at the end of the inspection, was in the process of correcting the deficiency.

The violation was determined to be more than minor because the inspector could not reasonably determine that the changes would not have ultimately required prior NRC approval. Violations of 10 CFR 50.59 are dispositioned using Traditional Enforcement process instead of the SDP because they are considered to be violations that could potentially impede or impact the regulatory process. However, if possible, the underlying technical issue is evaluated under the SDP to determine the severity of the violation. In this case, the inspector determined that the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," Tables 3b and 4a, for the Mitigating Systems Cornerstone. The inspector answered "Yes" to Question 5 under the Mitigating Systems Cornerstone column of the Phase 1 worksheet because the inspector concluded that the finding screened as potentially risk significant due to a severe weather initiating event.

In addition, the ROP finding of very low safety significance, Green, is dispositioned separately from the Traditional Enforcement violation and, therefore, the finding is being assigned a separate tracking number. Although there is an additional tracking number, the cross-cutting aspect is assigned only once. (FIN 05000306/2010012 02; Failure to Adequately Evaluate New Manual Operator Actions)

**Significance:**  Nov 05, 2010

Identified By: NRC

Item Type: FIN Finding

**INADEQUATE 50.59 EVALUATION FOR NEW MANUAL OPERATOR ACTIONS.**

A Severity Level IV NCV of 10 CFR 50.59(d)(1), “Changes, Tests, and Experiments,” was identified by the inspector for the licensee’s failure to provide an evaluation that adequately documented why implementing new manual operator actions during periods of adverse weather, which isolated portions of the component cooling water system susceptible to hazards associated with tornado-generated missiles, did not present a more than minimal increase in the likelihood of occurrence of a malfunction of a structure, system or component (SSC) important to safety previously evaluated in the updated safety analysis report (USAR). The licensee initiated CAP 1257118, “50.59 Screening Not Sufficient – 122 Spent Fuel Pool Heat Exchanger Component Cooling Loss,” and, at the end of the inspection, was in the process of correcting the deficiency.

The violation was determined to be more than minor because the inspector could not reasonably determine that the changes would not have ultimately required prior NRC approval. Violations of 10 CFR 50.59 are dispositioned using Traditional Enforcement process instead of the SDP because they are considered to be violations that could potentially impede or impact the regulatory process. However, if possible, the underlying technical issue is evaluated under the SDP to determine the severity of the violation. In this case, the inspector determined that the finding could be evaluated using the SDP in accordance with IMC 0609, “Significance Determination Process,” Attachment 0609.04, “Phase 1 – Initial Screening and Characterization of Findings,” Tables 3b and 4a, for the Mitigating Systems Cornerstone. The inspector answered “Yes” to Question 5 under the Mitigating Systems Cornerstone column of the Phase 1 worksheet because the inspector concluded that the finding screened as potentially risk significant due to a severe weather initiating event. Based upon Phase 3 SDP evaluation performed by a NRC Region III Senior Risk Analyst (SRA), the inspector concluded that the issue was of very low safety significance (Green). The inspectors concluded that this finding was cross cutting in the Problem Identification and Resolution area, corrective action component, because the licensee failed to thoroughly evaluate problems such that the resolutions address causes and extent of conditions as necessary [P.1(c)].

**Significance:**  Sep 30, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

**FAILURE TO ENSURE THAT RHR WOULD BE CAPABLE TO RESPOND DURING MODE 4 EVENTS**

A finding of very low safety significance and an associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” was identified by the inspectors on July 12, 2010, due to the failure to establish measures to assure that applicable regulatory requirements and the design basis for the residual heat removal (RHR) system were correctly translated into specifications, drawings, procedures and instructions. Specifically, the licensee failed to have appropriate procedures in place to ensure that the safety function of the RHR system was maintained following valve repositioning to support transitioning from the decay heat removal mode of RHR to providing suction from the refueling water storage tank (RWST) or following a Mode 4 loss of coolant accident.

This performance deficiency was determined to be more than minor because it was associated with the mitigating system cornerstone attribute of equipment performance and affected the cornerstone objective of ensuring the capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined that this issue was of very low safety significance, because other systems were available for injection into the reactor coolant system and feed the steam generators; and due to the extremely low probability of a large loss of coolant accident during Mode 4 operations. This finding had no cross-cutting aspect since there was no performance characteristic from IMC 0310 that was a significant contributor to the performance deficiency.

**Significance:**  Aug 30, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **Fuel Oil Storage Design Did Not Support EDGs 7-Day Supply**

The inspectors identified a finding having very low safety significance and an associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to ensure that the fuel oil storage capability for emergency diesel generators (EDGs) D5 and D6 maintained the minimum volume required to run under accident conditions for seven days as specified in Regulatory Guide 1.137 "Fuel Oil Systems for Standby Diesel Generators." Specifically, with one tank out-of-service, as allowed per procedure, the licensee would not have enough fuel to meet the mission time for one diesel following a single failure of the opposite diesel during an accident conditions. This finding was entered into the licensee's corrective action program and a Temporary Change Request was initiated by the licensee to update the procedure until all issues associated with EDGs fuel oil storage capabilities (i.e., common mode failure, single failure, etc.), are resolved.

The inspectors determined that this finding was more than minor because it was associated with the Mitigating Systems cornerstone attribute of equipment performance and affected the cornerstone objective of ensuring availability of the EDG to respond to initiating events to prevent undesirable consequences. This finding was of very low safety significance (Green) because a single storage tank provided sufficient fuel for EDG operation under accident loads for a period greater than the 24-hour probabilistic risk assessment (PRA) mission time. This finding had a cross cutting aspect in the area of Human Performance, Decision Making, because the licensee failed to thoroughly evaluate the impact of downgrading the interconnection between the tanks to non-safety-related and the scenarios and existing practices that it would affect. (IMC 0310, Section 06.01.a.(2) [H.1(b)])

Inspection Report# : [2010006](#) (pdf)

**Significance:**  Aug 30, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **Errors Found in the Electrical Relay Setting Calculation**

The inspectors identified a finding having very low safety significance and an associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," related to calculational errors found in the licensee's relay setting analysis. Specifically, the protective relay setting calculation for Unit 2 4 KV safeguards switchgear failed to include the over-current relay setting calibration tolerance limits and failed to use the actual field measured value for offsite source transformer neutral grounding resistor in calculating the line to ground fault current. This finding was entered into the licensee's corrective action program and a preliminary verification performed by the licensee concluded that the relay settings were still acceptable.

The inspectors determined that this finding was more than minor because it was associated with the Mitigating Systems cornerstone attribute of equipment performance and affected the cornerstone objective of ensuring availability and reliability of systems that respond to initiating events to prevent undesirable consequences. This finding was of very low safety significance (Green) because the licensee was able to demonstrate that the relay settings were still acceptable. The finding did not have a cross-cutting aspect because it was not reflective of current performance. (Section 1R21.3.b.(5))

Inspection Report# : [2010006](#) (pdf)

**Significance:**  Jun 30, 2010

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **LACK OF OPERATOR PROCEDURE USE DURING SYSTEM ALIGNMENT**

A self revealed finding of very low safety significance and a non-cited violation of Technical Specification 5.4.1 was identified on April 9, 2010, due to the licensee's failure to implement Step 5.1.1 of Procedure FP G DOC 03, "Procedure Use and Adherence." Step 5.1.1 of FP G DOC 03 required that personnel perform activities affecting quality using working copies of continuous or reference use procedures. However, operations personnel failed to use a working copy of reference use Procedure C37.13, "Containment and Auxiliary Building Cooling System," when performing valve alignments to support the performance of a surveillance test. The failure to use a working copy of C37.13 resulted in the operator performing a valve alignment incorrectly and a loss of one-half of the Unit 2 containment cooling system. Corrective actions for this issue included restoring the containment cooling system,

briefing licensee personnel on the event, and reinforcing the use of the human performance tools.

The inspectors determined that this finding was more than minor because it was associated with the human performance attribute of the Mitigating System Cornerstone and impacted the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined that this finding was of very low safety significance because it did not represent a loss of a system safety function, the fan coil units were inoperable for less than the Technical Specification allowed outage time, and the finding was not potentially risk significant due to external events. The inspectors determined that this finding was cross cutting in the Human Performance, Work Practices area because licensee personnel did not ensure human error prevention techniques were used such that work activities were performed safely (H.4(a)). (Section 4OA3.8)

Inspection Report# : [2010003](#) (*pdf*)

**Significance:** TBD May 03, 2010

Identified By: NRC

Item Type: AV Apparent Violation

**Failure to Ensure Design Measures Were Appropriately Established for the Emergency Diesel Generator, Auxiliary Feedwater, and Safety Related Battery Systems (Section 4OA5.1)**

An apparent violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors due to the licensee's failure to establish measures to ensure that engineered safety features such as the emergency diesel generators, the auxiliary feedwater system, and the safety related batteries were not adversely affected by events that cause turbine building flooding. As a result, flooding from these events would cause a loss of safety function for these systems. This issue was entered into the licensee's corrective action program (CAP) as CAP 1178236. Upon identifying this issue, the licensee implemented compensatory measures to ensure that the systems listed above were not adversely impacted following a turbine building internal flood.

This finding was determined to be more than minor because it impacted the design control and external events attributes of the Mitigating Systems cornerstone. The finding also impacted the Mitigating Systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors performed a Phase 1 SDP evaluation and determined that a Phase 3 evaluation was required because the finding represented a loss of safety function of multiple mitigating systems. A Phase 2 SDP evaluation was not performed because the Phase 2 SDP worksheets do not apply to internal flooding events. The results of the Phase 3 SDP assessment showed that this finding was potentially Greater than Green. No cross cutting aspect was assigned to this finding because licensee decisions made in regard to evaluating the susceptibility of mitigating systems equipment to turbine building internal flooding events were made more than 3 years ago and therefore, not reflective of current plant performance. (Section 4OA5.1)

Inspection Report# : [2010010](#) (*pdf*)

Inspection Report# : [2010011](#) (*pdf*)

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## Barrier Integrity

**Significance:**  Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

**FAILURE TO PROPERLY ASSESS AND MANAGE RISK DURING PLANNED MAINTENANCE ACTIVITY.**

The inspectors identified finding of very low safety significance and an NCV of 10 CFR 50.65 a(4) on August 31, 2010, due to a failure to properly assess and manage the risk associated with performing planned maintenance activities on the 111 switchgear unit cooler and the 121 control room chiller. Specifically, the licensee failed to identify these maintenance activities as high risk and implement additional risk management actions prior to starting the maintenance. As a result, an unexpected low suction pressure condition occurred on the 122 control room chiller pump. Corrective actions included restoring from the maintenance activities.

The inspectors determined the finding was more than minor because if left uncorrected, the failure to properly assess and manage plant risk could result in the need to shut down both reactors (a more significant safety concern) due to a

loss of control room cooling function. This finding was determined to be of very low safety significance because it was not specific to the radiological barrier provided by the control room ventilation system; was not a degradation of the barrier function of the control room against smoke or a toxic atmosphere; did not represent an actual open pathway in the reactor containment; and it did not involve an actual reduction in the function of hydrogen igniters. The inspectors concluded that this finding was cross-cutting in the area of Human Performance, Work Control area because the licensee did not plan and coordinate work activities consistent with nuclear safety (H.3(a)).

Inspection Report# : [2010005](#) (*pdf*)

**Significance:**  Aug 30, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Evaluate the Adequacy of Voltage for Safety-Related Equipment**

The inspectors identified a finding having very low safety significance and an associated NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the failure to consider design basis accident temperature and voltage variations when performing an operability evaluation of safety-related equipment with very low voltage margin. Specifically, during the 2010 CDBI self-assessment, a licensee's reviewer identified concerns regarding an operability evaluation that failed to consider the design basis accident temperatures and voltage. Although the licensee placed this issue in their corrective action program, the licensee failed to assess operability. After identification by the team, the licensee determined the associated equipment were operable or operable but non-conforming.

The inspectors determined that this finding was more than minor because it was associated with Barrier Integrity cornerstone attribute of design control and affected the cornerstone objective of providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. This finding was of very low safety significance (Green) because the finding was a not degradation of a boundary, was not an open pathway and did not impact the hydrogen igniters. This finding had a cross-cutting aspect in the area of problem identification and resolution in the component of self assessment because the 2010 CDBI self-assessment concerns were not evaluated and corrected. (IMC 0310, Section 06.02c.(3) [P3(c)]) (Section 1R21.3.b.(2))

Inspection Report# : [2010006](#) (*pdf*)

**Significance:**  Aug 30, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Inadequate Analysis Used to Determine PORV/LTOP Setpoint**

The inspectors identified a finding having very low safety significance and an associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to have adequate calculation used to ensure reactor vessel 10 CFR Part 50, Appendix G limits are not exceeded. Specifically, the design calculation performed by Westinghouse to determine the pressurizer power operated relief valve (PORV) lift setting for low temperature overpressure protection (LTOP) analysis failed to include the correct inputs for mass addition transient, and also failed to consider the seismic and environmental terms in the instrument uncertainty calculations. The licensee subsequently entered this finding into their corrective action program and performed an operability evaluation and determined the PORVs remained operable and capable of performing their LTOP functions.

The inspectors determined that this finding was more than minor because it was associated with the Barrier Integrity cornerstone attribute of design control and affected the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. This finding was of very low safety significance (Green) because it did not result in non-compliance with LTOP TS and the licensee's operability evaluation concluded that based on the last testing of the PORV opening stroke time, the predicted peak pressure was determined to be below the adjusted Appendix G pressure limit. Therefore, the PORVs remained operable and capable of performing their LTOP functions.

The finding did not have a cross-cutting aspect because it was not reflective of current performance. (Section 1R21.3.b.(3))

Inspection Report# : [2010006](#) (pdf)

**Significance:**  Aug 30, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **PORV Stroke Timing Acceptance Criteria Failed to Include Instrument Response Time**

The inspectors identified a finding having very low safety significance and an associated NCV of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for the licensee's failure to ensure adequate acceptance limits were incorporated into test procedures. Specifically, the acceptance criteria for allowable pressurizer power operated relief valve (PORV) opening stroke time within the periodic test procedure was not consistent with the original design criteria for low temperature overpressure protection (LTOP) analysis. The acceptance criteria limits did not include the instrument response time. This finding was entered into the licensee's corrective action program and a review of most recent tests showed the valves stroke time were acceptable and the valves were operable.

The inspectors determined that this finding was more than minor because it was associated with the Barrier Integrity cornerstone attribute of design control and affected the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. This finding was of very low safety significance (Green) because the function of the PORV opening in the required time had always been maintained and the finding did not result in non-compliance with LTOP TS. This finding did not have a cross-cutting aspect because it was not reflective of current performance. (Section 1R21.3.b.(4))

Inspection Report# : [2010006](#) (pdf)

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## **Emergency Preparedness**

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## **Occupational Radiation Safety**

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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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