



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE ROAD, SUITE 210  
LISLE, IL 60532-4352

April 18, 2012

Mr. Mark A. Schimmel  
Site Vice President  
Prairie Island Nuclear Generating Plant  
Northern States Power Company, Minnesota  
1717 Wakonade Drive East  
Welch, MN 55089

**SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2,  
NRC SUPPLEMENTAL INSPECTION REPORT 05000282/2012010;  
05000306/2012010, AND ASSESSMENT FOLLOW-UP LETTER**

Dear Mr. Schimmel:

On March 9, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection pursuant to Inspection Procedure 95001 at your Prairie Island Nuclear Generating Plant, Units 1 and 2. The enclosed report documents the results of this inspection, which were discussed during an exit meeting and regulatory performance meeting on March 9, 2012, with you and other members of your staff.

As required by the NRC Reactor Oversight Process (ROP) Action Matrix, this supplemental inspection was performed in accordance with Inspection Procedure (IP) 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area." The purpose of the inspection was to examine the causes for, and actions taken related to a finding having low to moderate safety significance (i.e., White) at Prairie Island Nuclear Generating Plant, Unit 1. The finding was associated with both trains of safety-related battery chargers being incapable of performing their safety-related functions from initial installation in 1994 to October 2011, due to being susceptible to locking up (i.e., stop providing an output, if the incoming alternating current voltage dropped below the nameplate minimum voltage at the battery charger motor control center during certain design basis events). The details of the finding are documented in previous communications dated June 9, 2011, and August 17, 2011, which included NRC Inspection Report Nos. 05000282/2011010; 05000306/2011010 and 05000282/2011011; 05000306/2011011, respectively. The NRC staff was informed by your letter dated January 17, 2012, of your readiness for this inspection.

This supplemental inspection was conducted to provide assurance that the root causes and contributing causes of the event resulting in the White finding were understood, to independently assess the extent of condition and extent of cause, and to provide assurance that the corrective actions for the risk-significant performance issues were sufficient to address the root causes and contributing causes to prevent recurrence.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspector reviewed selected procedures and records and interviewed personnel.

The NRC determined that your root cause evaluation was conducted to a level of detail commensurate with the significance of the problem and reached reasonable conclusions as to the root and contributing causes of the event. The NRC also concluded that you identified reasonable and appropriate corrective actions for each root and contributing cause and that the corrective actions appeared to be prioritized commensurate with the safety significance of the issues. Several observations regarding specific aspects of your root cause evaluation and corrective actions that warrant additional consideration by your staff were also identified.

Based on your overall acceptable performance in addressing the White finding that was the subject of this inspection, in accordance with the guidance in Inspection Manual Chapter (IMC) 0305, "Operating Reactor Assessment Program," the White finding will only be considered in assessing plant performance for a total of four quarters (i.e., through the first quarter of 2012). As a result, the NRC determined the performance at Prairie Island Nuclear Generating Plant Unit 1 to be in the Licensee Response Column of the ROP Action Matrix as of April 1, 2012.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any), will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/readingrm/adams.html> (the Public Electronic Reading Room).

Sincerely,

***/RA/ By Gary L. Shear Acting For/***

Steven West, Director  
Division of Reactor Projects

Docket Nos. 50-282, 50-306 and 72-010  
License Nos. DPR-42, DPR-60 and SNM-2506

Enclosure: Inspection Report 05000282/2012010; 05000306/2012010  
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 50-282; 50-306; 72-010  
License Nos: DPR-42; DPR-60; SNM-2506

Report Nos: 05000282/2012010; 05000306/2012010

Licensee: Northern States Power Company, Minnesota

Facility: Prairie Island Nuclear Generating Plant, Units 1 and 2

Location: Welch, MN

Dates: March 5-9, 2012

Inspector: R. Murray, Resident Inspector, Duane Arnold

Approved by: Kenneth Riemer, Chief  
Branch 2  
Division of Reactor Projects

Enclosure

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## SUMMARY OF FINDINGS

Inspection Report (IR) 05000282/2012010; 05000306/2012010; 03/05/2012 - 03/09/2012; Prairie Island Nuclear Generating Plant, Unit 1; Supplemental Inspection - Inspection Procedure (IP) 95001.

The resident inspector from Duane Arnold Energy Center performed this inspection. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

The NRC staff performed this supplemental inspection in accordance with IP 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," to assess the licensee's evaluation associated with both trains of Unit 1 safety-related battery chargers being incapable of performing their safety-related functions from initial installation in 1994 to October 22, 2011, due to being susceptible to locking up (i.e., stop providing an output, if the incoming alternating current voltage dropped below the nameplate minimum voltage at the battery charger motor control center during certain design basis events). The NRC staff previously characterized this issue as having low to moderate safety significance (White), as documented in NRC IR 05000282/2011011; 05000306/2011011.

During this inspection, the inspector determined that the licensee's root cause evaluation was conducted to a level of detail commensurate with the significance of the problem and reached reasonable conclusions as to the root and contributing causes of the event. The inspector also concluded that the licensee identified reasonable and appropriate corrective actions for each root and contributing cause and that the corrective actions appeared to be prioritized commensurate with the safety significance of the issues.

The licensee determined the root cause to be that key station personnel within engineering and the management team did not understand the safety function of the battery chargers during and after a Design Basis Accident (DBA). In addition, the licensee identified eight contributing causes. Corrective actions for the root cause included updating the Updated Safety Analysis Report (USAR) and Technical Specification (TS) Bases to accurately reflect the design and licensing basis of the safety-related battery chargers. Additionally, the licensee established a procedure for documenting and validating correct design and licensing basis information, and provided training to design engineering and operating staff. Corrective actions for the equipment condition that resulted in the (White) finding included replacing Unit 1 and planned replacement for Unit 2 safety-related battery chargers. Additionally, the licensee had established compensatory operator actions to restore the battery chargers, if needed, until the batter chargers were replaced.

Given the licensee's acceptable performance in addressing the battery charger condition, the (White) finding associated with this issue will only be considered in assessing plant performance for a total of four quarters (i.e., through first quarter 2012) in accordance with the guidance in IMC 0305, "Operating Reactor Assessment Program." As a result, the NRC determined the performance at Prairie Island Nuclear Generating Plant Unit 1 to be in the Licensee Response Column of the Reactor Oversight Process Action Matrix as of April 1, 2012.

### Findings

No findings were identified.

## REPORT DETAILS

### 4. OTHER ACTIVITIES

#### 4OA4 Supplemental Inspection (95001)

##### .01 Inspection Scope

This inspection was conducted in accordance with Inspection Procedure (IP) 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," to assess the licensee's evaluation of one White inspection finding in the Mitigating Systems Cornerstone. The inspection objectives were to:

- Provide assurance that the root causes and contributing causes of risk-significant performance issues are understood;
- Provide assurance that the extent of condition and extent of cause of risk-significant issues are identified; and
- Provide assurance that licensee corrective actions to risk significant performance issues are sufficient to address the root causes and contributing causes, and to prevent recurrence.

Prairie Island Nuclear Generating Plant Unit 1 entered the Regulatory Response column of NRC's Action Matrix in the second quarter of 2011 as the result of one inspection finding of low to moderate safety significance (White). The finding was associated with both trains of safety-related battery chargers being incapable of performing their safety-related functions from initial installation in 1994 to October 22, 2011, due to being susceptible to locking up (i.e., stop providing an output, if the incoming alternating current voltage dropped below the nameplate minimum voltage at the battery charger motor control center during certain design basis events). The details of the finding are documented in previous communications dated June 9, 2011, and August 17, 2011, which included U.S. Nuclear Regulatory Commission (NRC) Inspection Report Nos. 05000282/2011010; 05000306/2011010 and 05000282/2011011; 05000306/2011011, respectively.

By letter dated January 17, 2012, the licensee notified the NRC that it had completed its evaluation of the inadequate battery chargers and was ready for the NRC to assess the licensee's evaluation and subsequent corrective actions. In preparation for the inspection, the licensee performed a root cause evaluation (RCE), RCE 01297439, Revision 2, to identify weaknesses that existed in various organizations, which allowed for a risk-significant finding and to determine the organizational attributes that resulted in the White finding.

The inspector reviewed the licensee's RCE, in addition to other evaluations conducted in support, and as a result, of the RCE. The inspector reviewed corrective actions that were taken or planned to address the identified causes. The inspector also held discussions with licensee personnel to ensure that the root and contributing causes and the contribution of safety culture components were understood and corrective actions taken or planned were appropriate to address the causes and preclude repetition.

.02 Evaluation of Inspection Requirements

02.01 Problem Identification

- a. *Determine whether the evaluation identified who (i.e., licensee, self revealing, or NRC), and under what conditions the issue was identified.*

The inspector determined that the root cause evaluation adequately identified who identified the issue. In the problem statement of the root cause report, the licensee identified that there was an NRC-identified violation of Technical Specification 3.8.4 due to not maintaining both trains of Direct Current (DC) power subsystems operable in Modes 1 through 4 from December 21, 1994, to October 22, 2010. Condition Report (CR) 1297439 was generated in response to the NRC's letter of a preliminary White finding. The CR discusses that the site failed to recognize the significance of the common mode failure of the battery chargers until questioned by the NRC in October of 2010. The root cause evaluation was conducted as a corrective action for the parent CR 1297439.

The inspector determined that the RCE did not describe the conditions under which the issue was identified (i.e., the most recent events leading up to and including the identification of the issue by the NRC). However, the licensee referenced Apparent Cause Evaluation (ACE) 1253478 in the root cause report, which did discuss the events leading up to the identification of the issue by the NRC. The inspector determined through review of the RCE and discussions with plant personnel that the licensee agreed the NRC identified the issue and the licensee understood the conditions surrounding the identification of the issue.

- b. *Determine Whether The Evaluation Documented How Long The Issue Existed And, Whether There Were Any Prior Opportunities For Identification.*

The inspector determined that the root cause evaluation adequately identified how long the issue existed and whether there were any prior opportunities for identification. The RCE correctly stated that the issue with the battery chargers had existed since installation in 1994. The RCE also documents several opportunities for identification since that time.

The inspector noted that the RCE did not detail opportunities for identification of issue from approximately 1999 through 2010. The inspector discussed this observation with plant personnel and the management sponsor for the RCE. Personnel stated that the lack of understanding of the safety function of the battery chargers was well established and documented in condition reports, evaluations, and procedural changes by 1999. The RCE does state that a modification to replace the battery chargers was canceled in 2005 and that from 2005-2010 there were several Corrective Action Programs (CAPs) initiated, but the problem was not recognized. The inspector informed the licensee that by not detailing the opportunities for problem identification from 1999-2010, the licensee may have missed weaknesses in their programs. The licensee identified this issue in CR 1328464. Despite not detailing opportunities for identification from 1999-2010, the inspector determined that the licensee was still able to adequately determine the root and contributing causes for the battery charger issue. In addition, by correcting the root cause (lack of understanding of the battery charger safety significance), the inspector determined that any additional opportunities for identification from 1999-2010 would also

have been identified and corrected. As stated previously, ACE 1253478 discussed the most recent events, since 2010, leading up to the identification of the issue by the NRC.

- c. *Determine whether the licensee's root cause evaluation documented the plant specific risk consequences and compliance concerns associated with the issue.*

The inspector determined that the root cause evaluation adequately documented compliance concerns associated with the issue. The RCE identified that the station was not in compliance with TS 3.8.4 and the corrective actions necessary to restore compliance (i.e., install new battery chargers that were not susceptible to the same lock-up condition.) The RCE also discussed required compensatory measures needed until the battery chargers were replaced to restore full compliance with technical specifications.

The RCE included a discussion of nuclear safety significance and stated that no actual consequences resulted from the inoperability of the DC system. The evaluation stated the results of the NRC's safety significance determination process determined the finding to be of low to moderate safety significance (White).

The inspector noted that the licensee did not include quantitative risk consequence information in their evaluation. The licensee captured this observation in CR 1328464. However, the licensee did perform their own risk evaluation of the issue and the differences between the NRC's risk evaluation and the licensee's risk evaluation is discussed in Inspection Report (IR) 05000282/ 2011010, which the inspector reviewed. Interviews with licensee personnel indicated the licensee understood the differences between their evaluation and the NRC's Probabilistic Risk Assessment (PRA) evaluation.

- d. Findings

No findings were identified.

#### 02.02 Root Cause, Extent of Condition, and Extent of Cause Evaluation

- a. *Determine whether the licensee's root cause evaluation applied systematic methods in evaluating the issue in order to identify root causes and contributing causes.*

The inspector determined that the root cause evaluation adequately applied systematic methods in evaluating the issue in order to identify root causes and contributing causes. In its root cause analysis, the licensee used "Event and Causal Flow" in addition to the "Why Staircase" method of analysis. The inspector reviewed the licensee's procedure FP-PA-RCE-01, Root Cause Evaluation Manual, and determined the root cause evaluation met the requirements of the licensee's procedure.

- b. *Determine whether the licensee's root cause evaluation was conducted to a level of detail commensurate with the significance of the problem.*

The inspector determined that the root cause evaluation was conducted to a level of detail commensurate with the significance of the problem.

In its root cause analysis, the licensee identified one root cause and eight contributing causes.

## Root Cause

Key station personnel within engineering and the management team did not understand the safety function of the battery chargers during and after a DBA. This lack of understanding resulted in the organization failing to prevent or detect the inoperable condition of the battery charger. As a result, the following barriers failed, which could have identified or prevented the inoperability of the battery charger:

- 1996 Condition Report (CR) documenting the "lock-up" of the battery charger during performance of SP-I 083;
- Revision to the Alarm Operating Procedure (AOP) in 1996;
- 1997 Non-Conformance Report (NCR) investigating the "lock-up" failure of the battery charger;
- Revision to the Surveillance Procedure (SP) 1083 in 1999.

## Contributing Causes

- An analysis of Emergency Diesel Generator (EDG) transient output voltage during a LOOP/LOCA sequence was not developed when the lack of this analysis was identified during Design Basis Document (OBD) development.
  - The C&D chargers had an unanticipated failure mode where they would lock-up when supply voltage dropped too low.
  - The USAR description of DC system and battery charger functions did not directly correlate to functions assumed in the safety analysis.
  - Technical Specification Bases description of DC system and battery charger functions did not directly correlate to functions assumed in the safety analysis.
  - AOPs were revised to include a manual operator action in lieu of an automatic safety function.
  - Modification 94L453 (i.e., the original modification which installed the battery chargers in 1994) contained several deficiencies.
  - Procedural guidance did not exist which could be used to validate that relevant design and licensing basis information was identified and applied consistent with the letter and intent of the requirements.
  - In the mid 1990's, the ESP training program was missing some elements, which focused on understanding compliance with the design and licensing basis.
- c. *Determine whether the licensee's root cause evaluation included consideration of prior occurrences of the problem and knowledge of prior operating experience*

The inspector determined that the root cause evaluation adequately included consideration of prior occurrences of the problem and knowledge of prior operating experience. In its root cause analysis, the licensee identified both internal and external operating experience items that were related to the battery charger issue. In addition,

the licensee discussed prior opportunities for issue identification throughout the evaluation.

Based upon the considerations described above, the inspector concluded that although the licensee identified previous applicable operating experience (both internal and external), the licensee did not evaluate if and how the Operating Experience (OE) items discussed were processed by the station. This would have allowed the licensee to determine any specific shortcomings in their OE program. The licensee documented the inspector's observation in CR 1328515. The licensee did identify that there were a number of applicable OE issues and there may be an issue at the station with the quality of OE reviews. The licensee documented their concerns with OE review quality in CR 1316030 during the performance of the root cause evaluation; however, CR 1316030 did not assign any corrective actions and was considered completed/closed at the time of the 95001 inspection.

The inspector also noted from review of the internal operating experience that on October 23, 2009, an operator identified a concern with actions that were being taken during performance of SP 1083 (i.e., turning off the 12 battery charger prior to performance of the procedure). Specifically, the individual identified that actions being taken were a potential operator workaround (OWA). The operator documented his concerns in CR 1203825. The inspector noted that a condition evaluation performed by the station confirmed that the actions taken in SP 1083 were an OWA. Another condition evaluation determined that a modification (which was previously cancelled in 2005) should be re-opened in order to correct the identified concern. A corrective action was assigned to issue an Equipment Improvement Request (EIR) to reopen the modification. Once the EIR was generated, the station closed CR 1203825 on February 19, 2010. The inspector questioned whether the OWA was closed without positive assurance that the OWA would be fixed or resolved because generation of an EIR does not ensure the problem will be fixed, or implemented in a timely manner. The licensee documented the inspector's concern in CR 1328478.

- d. *Determine whether the licensee's root cause evaluation addressed extent of condition and extent of cause of the problem.*

The inspector determined that the root cause evaluation adequately addressed the extent of condition and extent of cause of the problem. The evaluation adequately reviewed the extent of issues associated with each root and contributing cause identified. Corrective actions were appropriate for the identified extent of cause and condition reviews.

In its root cause analysis, the licensee addressed the extent of condition by defining the condition as the battery charger's susceptibility to low input voltage conditions. The licensee determined that all battery chargers for each unit (11, 12, 21, 22 and spares) were susceptible to locking up during a low voltage condition. Corrective actions for this extent of condition included replacement of all station safety-related battery chargers with chargers that were not susceptible to the low input voltage condition (Corrective Action (CA) 1). As part of an interim corrective action, prior to replacing the battery chargers, the site implemented operator actions for battery charger recovery in the event of a battery charger lock up condition (CA 2). The site also considered other equipment which may be susceptible to low input voltage and transient voltage effects. In order to determine other susceptible equipment, the site was in the process of

developing a complete AC system transient model and subsequent analysis of the model (CAs 3 and 4).

The licensee addressed extent of cause by looking at the extent of the root cause, which was that personnel within engineering and management did not understand the safety function of the battery chargers during and after a DBA. The licensee considered the understanding of system design basis in general as part of the extent of cause review. Corrective actions included creation of a new procedure, which would be used in obtaining all relevant design basis information (Corrective Action to Prevent Recurrence (CAPR 3)). The station assigned a corrective action to perform a training needs analysis to determine the required training for interpreting design basis information (CA 10). The station also assigned corrective actions to review procedures and other program actions (Operator Burdens, operable but nonconforming (OBN) and operable but degraded (OBD) condition reports) for safety-related systems to determine if manual actions have been introduced that replace automatic safety functions (CAs 11, 12, 13, 14).

- e. *Determine whether the licensee's root cause evaluation, extent of condition and extent of cause appropriately considered the safety culture components as described in IMC 0310*

The inspector determined that, in general, the root cause, extent of condition, and extent of cause evaluations appropriately considered the safety culture components as described in IMC 0310.

The inspector reviewed the RCE and validated the licensee had systematically considered each of the safety culture components. Through their RCE, the licensee identified weaknesses in several of the safety culture components. The inspector reviewed the identified weaknesses and found some were aligned with the root and contributing causes. The licensee identified other weaknesses through their investigation not directly related to the root or contributing causes. The inspector's review of the event did not identify other potential weaknesses in safety culture components.

- f. Findings

No findings were identified.

#### 02.03 Corrective Actions

- a. *Determine whether the licensee specified appropriate corrective actions for each root/contributing cause or that the licensee evaluated why no actions were necessary.*

The inspector reviewed corrective actions and corrective actions to prevent recurrence and determined corrective actions were appropriate for the identified root and contributing causes.

The licensee's root cause evaluation identified three CAPRs and 14 CAs. All corrective actions assigned by the licensee addressed each of the root and contributing causes and were appropriate. The CAPRs implemented by the licensee included revising the USAR and the TS Bases to fully describe the licensing and design basis for all

safety-related battery chargers for both units. In addition, the licensee completed a CAPR to implement a procedure, which describes how to validate licensing and design basis information to ensure all information is identified and applied consistently in accordance with regulatory requirements.

Corrective actions taken by the licensee also included replacing all safety-related battery chargers (11/12/21/22/SPARE) with chargers designed to withstand design voltage transients. The licensee completed replacement of the Unit 1 chargers in June of 2011 and was in the process of replacing the Unit 2 charges at the time of this inspection. Interim corrective actions were also in place, which designated an operator to recover the battery chargers by use of manual action in the event the chargers experienced a lock-up condition.

- b. *Determine whether the licensee prioritized the corrective actions with consideration of the risk significance and regulatory compliance.*

The inspector determined that the licensee adequately prioritized the corrective actions with consideration of the risk significance and regulatory compliance. Once the licensee understood the condition they established designated operator positions to ensure that battery chargers could be recovered in the event of a lock up condition. This corrective action was taken immediately and approved by the NRC in an exigent License Amendment Request. The licensee also planned and replaced the battery chargers during the next refueling outage for each unit. There were few remaining corrective actions for the licensee to complete during the time of this inspection. Completion of replacement of the Unit 2 battery chargers was in progress (CA1). Development of a complete AC System Transient model and identify issues (enter into CAP) with any system design basis and/or design calculations was scheduled to be completed by December 2012 (CAs 3 and 4). A component design basis review of RHR (Residual Heat Removal) and CL (safety-related cooling water) to verify design basis and safety functions are correctly implemented and maintained is due in May 2012 (CA5). Effectiveness reviews (EFR) for the CAPRs are due in October of 2012 (EFR1 and 2). In summary, the inspector determined that the prioritization of corrective actions was appropriate.

- c. *Determine whether the licensee established a schedule for implementing and completing the corrective actions.*

The inspector determined that the licensee adequately established a schedule for implementing and completing the corrective actions. As stated above, corrective actions for this RCE will be complete by December 2012. All CAPRs have been completed and effectiveness reviews for those CAPRs will be completed in October 2012. The licensee completed replacement of the Unit 1 safety-related battery chargers in June of 2011 and was in the process of completing the replacement of the Unit 2 safety-related battery chargers. The inspector concluded the timeline for completion of CAs to be appropriate.

- d. *Determine whether the licensee developed quantitative or qualitative measures of success for determining effectiveness of the corrective actions to prevent recurrence.*

The inspector determined that the licensee adequately developed quantitative or qualitative measures of success for determining effectiveness of the corrective actions to prevent recurrence. The licensee had scheduled an open book exam, for design

engineering and operating staff, to assess the knowledge of their new procedure for design basis (CAPR 3) and the design function of the chargers (CAPRs 1 and 2). The licensee established quantitative criteria for acceptable/ passing scores (EFR1). The licensee also scheduled a review by their fleet design engineering group to review at least 10 activities which require using their new design basis procedure (EFR2). Acceptance criteria of zero errors attributed to design and licensing basis information which would contribute to an incorrect conclusion were established. The inspector concluded the effectiveness reviews were appropriate.

- e. *Determine that the corrective actions planned or taken adequately address the Notice of Violation that was the basis for the supplemental inspection.*

The inspector concluded that the corrective actions planned or taken adequately addressed the Notice of Violation.

The Notice of Violation associated with the White finding that was the subject of this IP 95001 inspection identified one violation of NRC requirements. In particular, a violation of TS 3.8.4 occurred from December 21, 1994, to approximately October 22, 2010, due to the safety-related battery chargers on Unit 1 failing to maintain the DC electrical power subsystems operable in Modes 1 through 4. The NRC concluded that the information regarding the reason for the violation, the corrective actions taken and planned to be taken to correct the violation and prevent recurrence, and the date when full compliance was achieved, is already adequately addressed on the docket in NRC Inspection Report Nos. 05000282/2011010; 05000306/2011010, and during the July 28, 2011, regulatory conference. The inspector reviewed the referenced inspection report and determined there were no additional concerns with regard to addressing the Notice of Violation.

- f. Findings

No findings were identified.

02.06 Evaluation Of Inspection Manual Chapter 0305 Criteria For Treatment Of Old Design Issues

This issue was evaluated against the criteria of IMC 0305 for treatment as an old design issue. This review was not done as part of this supplemental inspection since the inspector noted a review and determination was previously documented. A description of this review was documented in IR 05000282/2011010; 05000306/2011010. The inspector determined that the issue did not meet the criteria to be considered an old design issue.

Other Activities

(Closed) Violation 05000202/2011011-01, "Failure to Ensure that the Train A and Train B DC Electrical Power Subsystems Remained Operable in Modes 1 through 4."

The inspector determined that the licensee's RCE was conducted to a level of detail commensurate with the significance of the problem and reached reasonable conclusions as to the root and contributing causes of the event. The inspector also concluded that the licensee identified reasonable and appropriate corrective actions for each root and contributing cause and that the corrective actions appeared to be prioritized

commensurate with the safety significance of the issues. No other instance of the violation was identified. This violation is closed.

40A6 Exit Meeting

Exit Meeting Summary

The inspector presented the inspection results to Mr. Mark Schimmel and other members of licensee management on March 9, 2012. The inspector confirmed that proprietary information was not provided or examined during this inspection.

Regulatory Performance Meeting

On March 9, 2012, the NRC met with the licensee to discuss its performance in accordance with IMC 0305, Section 10.02.b.4. During this meeting, the NRC and licensee discussed the issues related to the White finding that resulted in Prairie Island Nuclear Generating Plant, Unit 1, being placed in the Regulatory Response Column of the NRC's ROP Action Matrix. This discussion included the causes, corrective actions, extent of condition, extent of cause, and other planned licensee actions.

ATTACHMENT: SUPPLEMENTAL INFORMATION

**SUPPLEMENTAL INFORMATION**

**KEY POINTS OF CONTACT**

Licensee

M. Schimmel, Site Vice President  
P. Huffman, Site Engineering Director  
K. Davison, Site Operations Director, Plant Manager (Acting)  
P. Anderson, Regulatory Affairs Director  
J. Anderson, Regulatory Affairs Manager  
T. Allen, Senior Engineering Manager  
M. Brossart, Engineering Supervisor  
M. Birkel, Licensing Engineer  
J. Forsman, System Engineer

Nuclear Regulatory Commission

K. Riemer, Chief, Division of Reactor Projects  
K. Stoedter, Senior Resident Inspector  
P. Zurawski, Resident Inspector

**LIST OF ITEMS OPENED, CLOSED AND DISCUSSED**

Opened

None.

Closed

05000202/2011011-01	VIO	Failure to Ensure that the Train A and Train B DC Electrical Power Subsystems Remained Operable In Modes 1 Through 4
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Discussed

None.

## LIST OF DOCUMENTS REVIEWED

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

### IP 95001

FP-PA-RCE-01; Root Cause Evaluation Manual; Revision 0  
FP-PA-EFR-01; Effectiveness Review Manual; Revision 0  
FP-PA-ARP-01; CAP Action Request Process; Revision 32  
RCE 1297439; Improper BATT CHG Installation; Revision 200  
ACE 1253478; Evaluate the adequacy of OPR 01238842  
1C20.9 AOP 3; Failure of 11 Battery Charger; Rev 2  
AR 1328464; NRC observation from 95001 Battery Charger Inspection  
AR 1328473; NRC observation from 95001 Battery Charger Inspection  
AR 1328477; NRC observation from 95001 Battery Charger Inspection  
AR 1328478; NRC observation from 95001 Battery Charger Inspection  
AR 1328515; NRC observation from 95001 Battery Charger Inspection  
AR 1316030; Quality of past OE Reviews  
AR 1228334; CDBI Preps 2010 Acc voltage discrepancies on chrgs & MCCs  
CR 19960452; Issue: 2010385 Action: 1 12 Battery Charger Intermittent Operation  
SP1083 on Thursday, February 22, 1996  
AR 00046569; Issue: 2001139 Action: 1 12 Battery Charger Erratic Voltage  
AR 00049974; Issue: 2001085 Action: 1 12 Battery Charger Failure  
AR 00057374; Issue: 94-11 Action: 1 12 Battery Charger Shorted  
AR 00058646; 12 Battery Charger Output Oscillation  
AR 00060478; 12 Battery Charger Pulsing Output  
AR 60831; Issue: 2005703 Action: 1 New 22 Battery Charger Installed  
Procedure Change Request (Pcr) 19960549; 1c20.9 Aop 3 Revision To Reset The 11 Battery  
Charger  
CR 19971622; Intermittent Operation During Sp 1083. (12 Battery Charger)  
CR 19991958; During Sp 1083, Unit 1 Integrated Si Test, Manual Operator Action Has Been  
Required To Restart 12 Battery Charger  
AR 00031255; Cat:2 12 Battery Charger May Require Manual Restarting  
AR 00262795; Perform Design Change To Keep 12 Battery Charger From Shutting Down  
AR 00263342; Safeguards Battery Room Ventilation Requirements  
AR 00269408; Missed Milestone And Recovery Plan  
AR 00281598; Wo 0200575 Was Issued W/O Provisions To Xfer Dc To 31 Charge  
AR 00399641; Temporary Battery Storage Area  
AR 00415229; Inadequate Task List Review For Modification  
AR 00424046; C-36-1 Reach Rod Has Electrical Wires Attached To It  
AR 00469394; When In Use, 11 P Batt Chg Seismic Mounting Is In Question  
AR 00528036; Pe Dcvt42-21 Not Oc Reviewed  
AR 00528626; Step In Sp 2314 Uses Ercs Point To Verify Charging Amps  
AR 00529501; 22 Battery Was Declared Operable With Inaccurate Data  
AR 00530358; Ercs Point Discrepancy Causing Confusion During Sp-2314  
AR 00586028; 22 Dc Panel Voltage Reading Low In Control Room  
AR 00592084; Warehouse/Engineering Self Live Doesn't Agree

AR 00721036; Request Calc To Support Potential Future Operability  
AR 00734161; Capacitor Shelf Life  
AR 00744489; Bypass Control Procedure (5AWI 3.9.0)  
AR 00747014; 11 Battery Charger PM Improperly Scheduled  
AR 00748326; Portable Battery Charger Does Not Meet TS SR 3.4.8.2  
AR 00755954; Entered C 47 AOP 1 Due To BOP Annunciator Ground.  
AR 00758958; 11 Battery Charger Failure During 10 Year PM  
AR 00775675; Operator Challenges Experienced During SP- 1083  
AR 00775867; Inverter Input Breakers Tripped During SP 1083  
AR 00819041; Prerequisites Of WO 0405356 Inadvertently N/A'D  
AR 00829055; PE-0540-2-22 22 Battery Charger Pm Pre-Outage Activity  
AR 00830798; Safety Related Parts May Not Be Available For 2r23  
AR 00831498; WO'S Not At Proper Status As Of 4/11/05  
AR 00832468; WO-0501125 Step Instructions Unclear  
AR 00845279; Problem Encountered During Restoration Of 22 Battery Charger  
AR 00845336; Disconnect Switch Not In Expected Position  
AR 00887341; Track Pca's And Pcr's To Completion  
AR 01019966; Parts concern for 12 BATT CHG WO 99100  
AR 1025270; Issues noted during 12 Battery Charger 10 year PM  
AR 1025527; 3 Newly Refurbished ckt cards from NLI did not function  
AR 1084329; Issues with 21 BATT CHG PM Preparations  
AR 1127369; 11 Battery Charger fuses rejected prior to installation  
AR 1136897; Inconsistent setpoint in SPs  
AR 1141506; Cause for 21 Battery Charger failure identified and repaired  
AR 1162318; PCBs found not replaced on battery chargers  
AR 1169825; 12 battery charger enclosure  
AR 1177445; panel on 12 battery charger appears to be bent  
AR 1194583; Low battery electrolyte level in emergency lighting  
AR 1199287; Unsecured Battery Charger In 12 Battery Rm Seismic Concern  
AR 1201603; 11 Portable Battery Charger exceeded 24 months on SR 3.8.4.1  
AR 1203825; 12 Battery Charger failure to re-start after load sequence.  
AR 1214555; Batt. charger calc inputs are outdated & non-conserative  
AR 1228334; CDBI Preps 2010 Acc. voltage discrepancies on chgrs & MCCs  
AR 1228338; CDBI Preps 2010 Incorrect charger load modeled in ETAP  
AR 1231566; equalize voltage changed when not specified in procedure  
AR 1236006; CDBI Prep Battery Charger brker coordination not documented  
AR 1238842; CDBI 2010 Prep SP1083 revised w/o proper 50.59 screening  
AR 1238880; CDBI 2010 Preps CAP 01203825 was improperly closed  
AR 1241533; ITS Missed Impact of TS Surveillance Requirement Changes  
AR 1243574; 2010 CDBI Battery Charger Modification 94L453 and PMT  
AR 1250561; Battery Chargers may stop operating if UV setpt is reached  
AR 1252265; Questions related to OPR and Reportability for CAP 1238842  
AR 1253478; Concerns with the OPR from 01238842 on 12 Battery Charger  
AR 1254278; AR 01241533 closed to AR 01238842 inappropriately  
AR 1254359; compensatory measures not evaluated properly  
AR 1255628; Organizational failure to evaluate changes to Integrated SI  
AR 1257290; "Battery Watch Book" had wrong procedure revisions  
AR 1258144; Documentation of Operator manual actions for battery chargers  
AR 1259491; Ops Burden Impact Factor Incorrect for 12 Battery OWA  
AR 1261400; Analysis of station loads powered from off-site sources  
AR 1262227; Past Operability Not Performed

AR 1264148; Missed 50.72 Report - Battery Chargers  
AR 1266624; ACE should have been generated for AR 01250561  
AR 1266968; Access to battery rooms during HELB  
AR 1267032; Discrepancies with OPR 01250561  
AR 1270104; Non conservative assumption in Unit 1 Battery Calcs  
AR 1274753; Anomaly with SP 2083 (WO 327093) performed 5/17/2010  
AR 1275834; Simulator Modeling of DC System Response  
AR 1277162; Battery Charger SDP identified other lockup scenarios  
AR 1281492; Battery Charger Output Cables are not sized per EM 3.3.1.5  
AR 1291168; OPR 01250561 Battery Charger needs revision  
AR 1296360; document not found for portable battery charger anchorage  
AR 1297439; Conduct a RCE for NRC BATT CHG installation finding  
AR 1302170; "Emergency Loads" actions is still not complete  
AR 1302268; OPR#01270104 did not evaluate U1 DC Sys DBA loads Past 1hr  
AR 1313829; A-Level Action rejected by PARB not re-opened  
AR 1317777; RCE 01297439 did not address finding Notice of Violation

## LIST OF ACRONYMS USED

ACE	Apparent Cause Evaluation
ADAMS	Agencywide Documents Access and Management System
AOP	Alarm Operating Procedure
CAP	Corrective Action Program
CR	Condition Report
DBA	Design Basis Accident
DC	Direct Current
EDG	Emergency Diesel Generator
EFR	Effectiveness Reviews
EIR	Equipment Improvement Request
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
NCR	Non-Conformance Report
NRC	U.S. Nuclear Regulatory Commission
OBD	Operable But Degraded
OBN	Operable But Nonconforming
OE	Operating Experience
OWA	Operator Workaround
PARS	Publicly Available Records System
PRA	Probabilistic Risk Assessment
RCE	Root Cause Evaluation
RHR	Residual Heat Removal
ROP	Reactor Oversight Process
SCAQ	Significant Condition Adverse to Quality
SP	Surveillance Procedure
TS	Technical Specification
USAR	Updated Safety Analysis Report

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspector reviewed selected procedures and records and interviewed personnel.

The NRC determined that your root cause evaluation was conducted to a level of detail commensurate with the significance of the problem and reached reasonable conclusions as to the root and contributing causes of the event. The NRC also concluded that you identified reasonable and appropriate corrective actions for each root and contributing cause and that the corrective actions appeared to be prioritized commensurate with the safety significance of the issues. Several observations regarding specific aspects of your root cause evaluation and corrective actions that warrant additional consideration by your staff were also identified.

Based on your overall acceptable performance in addressing the White finding that was the subject of this inspection, in accordance with the guidance in Inspection Manual Chapter (IMC) 0305, "Operating Reactor Assessment Program," the White finding will only be considered in assessing plant performance for a total of four quarters (i.e., through the first quarter of 2012). As a result, the NRC determined the performance at Prairie Island Nuclear Generating Plant Unit 1 to be in the Licensee Response Column of the ROP Action Matrix as of April 1, 2012.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any), will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/readingrm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/ By Gary L. Shear Acting For/**

Steven West, Director  
Division of Reactor Projects

Docket Nos. 50-282, 50-306 and 72-010  
License Nos. DPR-42, DPR-60 and SNM-2506  
Enclosure: Inspection Report 05000282/2012010; 05000306/2012010  
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Letter to M. Schimmel from S. West dated April 17, 2012

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2,  
NRC SUPPLEMENTAL INSPECTION REPORT 05000282/2012010;  
05000306/2012010, AND ASSESSMENT FOLLOW-UP LETTER

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