

April 12, 2004

Mr. Joseph Solymossy
Site Vice-President
Prairie Island Nuclear Generating Plant
Nuclear Management Company, LLC
1717 Wakonade Drive East
Welch, MN 55089

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2
NRC INSPECTION REPORT 05000282/2004002(DRS);
05000306/2004002(DRS)

Dear Mr. Solymossy:

On March 5, 2004, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Prairie Island Nuclear Generating Plant facility. The enclosed report documents the inspection findings which were preliminarily discussed on March 5, 2004, with Mr. Werner and other members of your staff.

The inspection examined the effectiveness of activities conducted under your license as they related to the implementation of your NRC approved Fire Protection Program. The inspection consisted of a selected examination of design drawings, calculations, analyses, procedures, audits, field walkdowns, and interviews with personnel.

Based on the results of this inspection, there was one NRC-identified finding of very low safety significance which involved a violation of NRC requirements. However, because this violation was non-willful and non-repetitive and because it was entered into your corrective action program, the NRC is treating this finding as a Non-Cited Violation, in accordance with Section VI.A.1 of the NRC's Enforcement Policy.

If you contest the subject or severity of a Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Prairie Island Nuclear Generating Plant facility.

As part of the preparation for this inspection, the NRC had requested, by letter dated November 6, 2003, that post-fire safe shutdown analyses, including post-fire safe shutdown systems and separation analyses, be available on-site during the information gathering visit which occurred January 13 through January 14, 2004. In response to this request, your staff provided a number of safe shutdown analysis documents to the inspectors during the information gathering visit. However, your staff did not provide approved calculation GEN-PI-052, "Safe Shutdown Equipment for Compliance with 10 CFR Part 50, Appendix R," to

the team until late in the on-site portion of the inspection. The unavailability of this document at the beginning of this inspection contributed to considerable additional inspection effort and delay in understanding your safe shutdown analysis. In order to conduct effective inspections, it is important that inspection personnel be provided with all applicable documents in a timely manner.

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

Sincerely,

/RA/

Julio F. Lara, Chief
Electrical Engineering Branch
Division of Reactor Safety

Docket Nos. 50-282; 50-306
License Nos. DPR-42; DPR-60

Enclosure: Inspection Report 05000282/2004002(DRS);
05000306/2004002(DRS)

cc w/encl: C. Anderson, Senior Vice President, Group Operations
J. Cowan, Executive Vice President and Chief Nuclear Officer
Regulatory Affairs Manager
J. Rogoff, Vice President, Counsel & Secretary
Nuclear Asset Manager
Tribal Council, Prairie Island Indian Community
Administrator, Goodhue County Courthouse
Commissioner, Minnesota Department
of Commerce
Manager, Environmental Protection Division
Office of the Attorney General of Minnesota

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cc w/encl: C. Anderson, Senior Vice President, Group Operations
 J. Cowan, Executive Vice President and Chief Nuclear Officer
 Regulatory Affairs Manager
 J. Rogoff, Vice President, Counsel & Secretary
 Nuclear Asset Manager
 Tribal Council, Prairie Island Indian Community
 Administrator, Goodhue County Courthouse
 Commissioner, Minnesota Department
 of Commerce
 Manager, Environmental Protection Division
 Office of the Attorney General of Minnesota

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 50-282; 50-306
License Nos: DPR-42; DPR-60

Report No: 05000282/2004002(DRS);
05000306/2004002(DRS)

Licensee: Nuclear Management Company, LLC

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

Location: 1717 Wakonade Drive East
Welch, MN 55089

Dates: January 26 through March 5, 2004

Inspectors: R. Langstaff, Senior Reactor Engineer
R. Daley, Reactor Engineer
G. Hausman, Senior Reactor Engineer

Observers: D. Tharp, Reactor Engineer

Approved by: J. Lara, Chief
Electrical Engineering Branch
Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000282/2004002(DRS); 05000306/2004002(DRS); 01/26/2004 - 03/5/2004; Prairie Island Nuclear Generating Plant, Units 1 and 2; Fire Protection Triennial.

This report covers an announced baseline triennial fire protection inspection. The inspection was conducted by three Region III inspectors. One Green finding associated with one Non-Cited Violation were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be "Green" or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspector-Identified and Self-Revealed Findings

Cornerstone: Initiating Events

- Green. A finding of very low safety significance was identified by the inspectors in that a hazardous quantity of transient combustibles was present in fire areas 58 and 73. The hazardous quantity of transient combustibles present invalidated an existing exemption for the lack of a fire suppression system. Once identified, the licensee removed the majority of the transient combustible materials from the fire areas.

This finding was more than minor because the presence of transient combustibles beyond what was approved by the NRC could result in the increased likelihood of a fire which could challenge safe shutdown. The finding was of very low safety significance because a fire from the observed transient combustibles would not result in plume temperatures which exceeded the damage threshold of cables used at Prairie Island Nuclear Generating Plant. This issue was a violation of 10 CFR 50.48 and 10 CFR Part 50, Appendix R, Section III.G.1, because the hazardous quantity of transient combustibles present invalidated an existing exemption for the lack of a fire suppression system. (Section 1R05.8.b)

B. Licensee-Identified Violations

None.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events and Mitigating Systems

1R05 Fire Protection (71111.05)

The purpose of this inspection was to review the Prairie Island Nuclear Generating Plant fire protection program for selected risk-significant fire areas. Emphasis was placed on verifying that the post-fire safe shutdown capability and the fire protection features were maintained free of fire damage to ensure that at least one post-fire safe shutdown success path was available. The inspection was performed in accordance with the NRC regulatory oversight process using a risk-informed approach for selecting the fire areas and attributes to be inspected. The lead inspector used the Prairie Island Nuclear Generating Plant Individual Plant Examination for External Events along with insights gained during plant walkdowns to choose risk-significant areas for detailed inspection and review. The fire areas chosen for review during this inspection were:

<u>Fire Area</u>	<u>Description of Fire Area Reviewed</u>
58	Auxiliary Building, Ground Floor, Unit 1
73	Auxiliary Building, Ground Floor, Unit 2

The above two areas were selected based as risk insights and the large physical areas encompassed within the designated fire areas. As these two large fire areas consisted of the auxiliary building basements of both units, the inspectors considered these two inspection samples as equivalent in complexity to three samples as specified in the Fire Protection procedure. The primary focus for this inspection was on the safe shutdown procedures and safe shutdown methodology for the selected fire areas. The determination of license commitments and changes to the fire protection program were reviewed for the selected fire areas.

.1 Systems Required to Achieve and Maintain Post-Fire Safe Shutdown

Title 10 CFR Part 50, Appendix R, Section III.G.1, required the licensee to provide fire protection features that were capable of limiting fire damage to structures, systems, and components important to safe shutdown. The structures, systems, and components that were necessary to achieve and maintain post-fire safe shutdown were required to be protected by fire protection features that were capable of limiting fire damage to the structures, systems, and components so that:

- One train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control station(s) was free of fire damage; and
- Systems necessary to achieve and maintain cold shutdown from either the

control room or emergency control station(s) could be repaired within 72 hours.

Specific design features for ensuring this capability were specified by 10 CFR Part 50, Appendix R, Section III.G.2.

a. Inspection Scope

The inspectors reviewed the plant systems required to achieve and maintain post-fire safe shutdown to determine if the licensee had properly identified the components and systems necessary to achieve and maintain safe shutdown conditions for each fire zone selected for review. Specifically, the review was performed to determine the adequacy of the systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring, and support system functions. This review included the fire protection safe shutdown analysis.

The inspectors also reviewed the operators' ability to perform the necessary manual actions for achieving safe shutdown including a review of procedures, accessibility of safe shutdown equipment, and the available time for performing the actions.

The inspectors reviewed the updated final safety analysis report and the licensee's engineering and/or licensing justifications (e.g., NRC guidance documents, license amendments, technical specifications, safety evaluation reports, exemptions, and deviations) to determine the licensing basis.

b. Findings

No findings of significance were identified.

.2 Fire Protection of Safe Shutdown Capability

Title 10 CFR Part 50, Appendix R, Section III.G.2, required separation of cables and equipment and associated circuits of redundant trains by a fire barrier having a three hour rating. If the requirements cannot be met, then alternative or dedicated shutdown capability and its associated circuits, independent of cables, systems or components in the area, room, or zone under consideration should be provided. (Section III. G.3)

a. Inspection Scope

For each of the selected fire areas, the inspectors reviewed the licensee's safe shutdown analysis to ensure that at least one post-fire safe shutdown success path was available in the event of a fire. This included a review of manual actions required to achieve and maintain hot shutdown conditions and make the necessary repairs to reach cold shutdown within 72 hours. The inspectors also reviewed procedures to verify that adequate direction was provided to operators to perform these manual actions. Factors, such as timing, access to the equipment, and the availability of procedures, were considered in the review.

The inspectors also evaluated the adequacy of fire suppression and detection systems, fire area barriers, penetration seals, and fire doors to ensure that at least one train of

safe shutdown equipment was free of fire damage. To accomplish this, the inspectors observed the material condition and configuration of the installed fire detection and suppression systems, fire barriers, and construction details and supporting fire tests for the installed fire barriers. In addition, the inspectors reviewed license documentation, such as deviations, detector placement drawings, fire hose station drawings, smoke removal plans, fire hazard analysis reports, safe shutdown analyses, and National Fire Protection Association codes to verify that the fire barrier installations met license commitments.

b. Findings

No findings of significance were identified.

.3 Post-Fire Safe Shutdown Circuit Analysis

Title 10 CFR Part 50, Appendix R, Section III.G.1, required that structures, systems, and components important to safe shutdown be provided with fire protection features capable of limiting fire damage to ensure that one train of systems necessary to achieve and maintain hot shutdown conditions remained free of fire damage. Options for providing this level of fire protection were delineated in 10 CFR Part 50, Appendix R, Section III.G.2. Where the protection of systems whose function was required for hot shutdown did not satisfy 10 CFR Part 50, Appendix R, Section III.G.2, an alternative or dedicated shutdown capability and its associated circuits, was required to be provided that was independent of the cables, systems, and components in the area. For such areas, 10 CFR Part 50, Appendix R, Section III.L.3, specifically required the alternative or dedicated shutdown capability to be physically and electrically independent of the specific fire areas and capable of accommodating post-fire conditions where offsite power was available and where offsite power was not available for 72 hours.

a. Inspection Scope

On a sample basis, the inspectors evaluated the adequacy of separation provided for the power and control cabling of redundant trains of shutdown equipment. This investigation focused on the cabling of selected components in systems important for safe shutdown. The inspectors' review also included a sampling of components whose inadvertent operation due to fire may adversely affect post-fire safe shutdown capability. The purpose of this review was to determine if a single exposure fire, in one of the fire areas selected for this inspection, could prevent the proper operation of both safe shutdown trains.

b. Findings

No findings of significance were identified.

.4 Operational Implementation of Shutdown Capability

Title 10 CFR Part 50, Appendix R, Section III.L.2.d, required that the process monitoring function should be capable of providing direct readings of the process variables necessary to perform and control the functions necessary to achieve reactivity control, reactor coolant makeup, and decay heat removal.

a. Inspection Scope

The inspectors performed a walkdown of a sample of the actions defined in procedure F5, Appendix D, "Impact of Fire Outside Control/Relay Room." The inspectors reviewed the ability of operators to perform procedure actions within applicable plant shutdown time requirements. The inspectors also focused on equipment labeling being consistent with the procedure.

The inspectors' reviews of the adequacy of communications and emergency lighting associated with these procedures are documented in Sections 1R05.6 and 1R05.7 of this report.

b. Findings

Introduction: The inspectors identified an unresolved item (URI) concerning the cycling of safety injection (SI) pumps to accomplish inventory and pressure control in the event of a fire in certain fire areas. The inspectors were concerned that cycling SI pumps could adversely affect the pump motors and impact safe shutdown capability. This issue is an unresolved pending further engineering review.

Description: The inspectors identified that for a fire scenario in fire areas 58 and 73, the functions of inventory and pressure control may have to be accomplished using a SI pump. Attachment 1, "Inventory Control with a Safety Injection Pump," of procedure F5, Appendix D, "Impact of Fire Outside Control/Relay Room," directed operators provide makeup to the reactor coolant system using an SI pump. In addition, the SI pumps were relied upon for inventory control for fire areas 32, 33, 35, 58, 66, 69, 73, 80, 81, and odd numbered fire areas of areas 97 through 129. Attachment 1 directed operators to maintain a desired pressurizer level control band of 15 to 50 percent and to start and stop the SI pump, as necessary, to maintain pressurizer level during a plant cooldown. Attachment 1 of procedure F5, Appendix D, did provide a safety injection pump operating restriction in specifying that "the number of cycles of the SI Pump should be minimized." No additional guidance was provided to clarify the intent of "minimized." However, the inspection team noted that the pump vendor manual for the pump contained the following limitations:

The pump can be started two times in succession cold, and once at operating temperature. If the pump runs for 20 minutes or more at operating speed, it can be restarted immediately. If it runs less than 20 minutes at speed and then stops or is shut down, it must remain shut down for 40 minutes before restarting.

The inspectors identified that the specific limitations of the vendor manual had not been incorporated into Attachment 1. In addition, the inspectors interviewed a licensed operator in regards to the actions specified by Attachment 1. The operator was not aware of any specific starting limitations, such as those specified by the vendor, for the SI pumps. Accordingly, the inspectors determined that operators could have operated an SI pump outside of the vendor limitations during a postulated fire scenario.

The inspectors noted that when a motor is started, the current required to bring the rotor up to full speed is significantly greater than the current that the motor draws under operating load conditions. This higher amount of current causes large temperature rises in the windings of the motor. After the initial heat up of a motor from starting, the motor will cool down to its full load temperature. The cooldown is aided by the air motion created by the motor rotation. The 20-minute constraint specified by the vendor for running an SI pump at operating speed prior to immediately restarting addresses the increased cooling affects to the motor windings that a running motor experiences due to increased air motion. At 20 minutes, the motor will have been sufficiently cooled so that a pump stop and subsequent restart would not result in a injurious temperature in the windings. Since the temperature would be higher if the pump was stopped before 20 minutes of operation, the rest period restriction of 40 minutes allows the windings to cool prior to restarting the motor. If these limitations were not observed, the pump motor windings would be at a higher temperature during subsequent starts. The inspectors were concerned that SI pump starts performed outside of the limitations specified by the vendor could damage the windings of the motor and adversely affect pump operability because adequate cooling of the motor was not provided.

In response to the inspectors' concerns, the licensee initiated corrective action document CAP035339 and revised Attachment 1 of procedure F5, Appendix D, on February 13, 2004, to incorporate the vendor limitations. To evaluate whether the motor would be damaged by repetitive starts, the licensee compared the thermal limit curve of the motor to the starting current versus time curve for the motor. Since only 8.6 percent of the thermal limit was consumed, the licensee determined, based on a straight ratio, that it would take 11 consecutive starts before the thermal limit of the motor was reached (i.e., 11 starts would consume almost 100 percent of the thermal limit). The licensee also determined that, under worst case conditions, only nine starts of the Safety Injection pump would be required to cool down the plant. As a result of this analysis, the licensee concluded that the SI pump motor would not be damaged even if it had not met the limitations for motor start and stops imposed by the vendor manual.

The inspectors noted that the thermal limits curve used for the licensee's analysis assumed a single motor start at operating temperature. However, the pump motor windings would be at a higher temperature if the pump had been started and stopped a short period before being restarted. The inspectors were concerned that the underlying assumptions for the curve used by the licensee for their analysis may not be valid for multiple pump starts. The inspectors did not consider the licensee's analysis to provide sufficient justification to allow SI pump restarts outside of the vendor manual limitations. The licensee agreed to review this issue further. This issue will be considered an unresolved item (URI) pending the licensee completing further reviews of this issue and subsequent NRC evaluation. (URI 0500282/2004002-01; 0500306/2004002-01)

.5 Emergency Lighting

Title 10 CFR Part 50, Appendix R, Section III.J., required that emergency lighting units with at least an 8-hour battery power supply be provided in all areas needed for operation of safe shutdown equipment and in access and egress routes thereto.

a. Inspection Scope

The inspectors performed a walkdown of a sample of the actions defined in procedure F5, Appendix D. As part of the walkdowns, the inspectors focused on the existence of sufficient emergency lighting for access and egress to areas and for performing necessary equipment operations.

b. Findings

No findings of significance were identified.

.6 Cold Shutdown Repairs

Title 10 CFR Part 50, Appendix R, Section III.L.5, required that equipment and systems comprising the means to achieve and maintain cold shutdown conditions should not be damaged by fire; or the fire damage to such equipment and systems should be limited so that the systems can be made operable and cold shutdown achieved within 72 hours. Materials for such repairs shall be readily available onsite and procedures shall be in effect to implement such repairs.

a. Inspection Scope

The inspectors reviewed the licensee's procedures to determine if any repairs were required to achieve cold shutdown. The inspectors determined that the licensee did require repair of some equipment to reach cold shutdown based on the safe shutdown methods used. The inspectors reviewed the procedures for adequacy.

b. Findings

No findings of significance were identified.

.7 Fire Barriers and Fire Zone/Room Penetration Seals

Title 10 CFR Part 50, Appendix R, Section III.M, required that penetration seal designs be qualified by tests that are comparable to tests used to rate fire barriers.

a. Inspection Scope

The inspectors reviewed the test reports for three-hour rated barriers installed in the plant and performed visual inspections of selected barriers to ensure that the barrier installations were consistent with the tested configuration. In addition, the inspectors reviewed the fire loading for selected areas to ensure that existing barriers would not be challenged by a potential fire.

b. Findings

No findings of significance were identified.

.8 Fire Protection Systems, Features, and Equipment

a. Inspection Scope

The inspectors reviewed the material condition, operations lineup, operational effectiveness, and design of fire detection systems, fire suppression systems, manual fire fighting equipment, fire brigade capability, and passive fire protection features. The inspectors reviewed deviations, detector placement drawings, fire hose station drawings, and fire hazard analysis reports to ensure that selected fire detection systems, sprinkler systems, portable fire extinguishers, and hose stations were installed in accordance with their design, and that their design was adequate given the current equipment layout and plant configuration.

b. Findings

Introduction: The inspectors identified a Green, Non-Cited Violation (NCV) of 10 CFR 50.48 and 10 CFR Part 50, Appendix R, III.G.2, due to the presence of a hazardous quantity of transient combustibles in fire areas 58 and 73. The inspectors determined that the presence of hazardous quantities of transient combustibles in the fire areas invalidated an existing exemption for the lack of a fire suppression system.

Description: Fire areas 58 and 73 at Prairie Island Nuclear Generating Plant consisted of the ground floor auxiliary building for both Unit 1 (fire area 58) and Unit 2 (fire area 73). The fire areas consisted of primarily open areas containing safety injection pumps, component cooling water pumps and heat exchangers, containment spray pumps, and charging pumps.

The NRC granted an exemption, by letter dated January 9, 1984, from Section III.G.2 of 10 CFR Part 50, Appendix R, to the extent these two fire areas lacked an automatic suppression system. The NRC safety evaluation report (SER) associated with the exemption stated that the amount of combustible loading in fire area 58 was approximately 10,000 British thermal units (BTUs) per square foot, and the combustible loading in fire zone 73 was approximately 8,000 BTUs per square foot. The SER also stated, "Hazardous quantities of transient combustibles would not be expected in these fire zones for several reasons. First, the zones are not adjacent to or near any major plant traffic route. Second, maintenance and operations in these zones do not involve the use of combustible materials. Third, accessibility to these zones is restricted to personnel performing essential duties in the zones because of potential radiation hazards. On this basis, we agree with the licensee that any fires in these zones resulting from transient combustibles would be of low severity and short duration." As such, the inspectors determined that the NRC acceptance was, in large part, based upon the low amount of combustible loading in the areas.

During plant walkdowns of these areas, the inspectors determined that, contrary to the SER evaluation, there was a significant amount of transient combustibles in the areas.

Many of the combustibles had been permanently staged in the area for ease of use to support maintenance and operations activities. As of January 27, 2004, the inspectors identified the following materials in Fire Areas 58 and 73:

- Three laundry carts partially filled with anti-contamination clothing - two of the carts were located next to each other;
- Numerous rolls of plastic bagging material;
- Nine open plastic containers filled with cloth and plastic materials;
- One metal trash can filled with cloth rags; and
- Several non-fire rated metal cabinets containing cloth and plastic materials.

The inspectors reviewed procedure, 5AWI 3.13.2, "Fire Preventive Practices," and determined that the licensee had not established administrative controls to preclude a transient combustible from being located such that a secondary fire could be started as the result of a fire from transient combustibles. The inspectors concluded that the presence of such an abundance of transient combustibles presented a hazardous quantity of transient materials and was not consistent with the underlying assumptions made in the exemption granted on January 9, 1984.

Analysis: In accordance with Inspection Manual Chapter (IMC) 0612, the inspectors determined that the issue of not controlling transient combustibles was a performance deficiency. This performance deficiency was determined to be more than minor because the finding was associated with the protection against external factors (i.e., fire) attribute of the initiating events objective. The presence of transient combustibles beyond what was approved by the NRC could result in the increased likelihood of a fire which challenged safe shutdown. In accordance with IMC 0609, Appendix A, the inspectors performed a Significance Determination Process (SDP) Phase 1 screening and determined that the finding degraded the Fire Protection portion of the Initiating Events Cornerstone. As such, a Phase 3 SDP analysis was performed.

The inspectors determined that the most significant fire hazard posed by observed transient combustibles were two laundry carts next to each other beneath overhead cables. Accordingly, the inspectors evaluated the potential impact of two laundry carts on fire upon overhead cables using the Plume Temperature Calculation spreadsheet of NUREG-1805, "Fire Dynamics Tools (FDT^s) Quantitative Fire Hazard Analysis Methods for the U.S. Nuclear Regulatory Commission Fire Protection Inspection Program, Draft Report for Comment," dated June 2003. The inspectors estimated the heat release rate for two laundry containers to be approximately 1200 kilowatts. The estimation was based on the assumption that one laundry container was roughly equivalent to two 30-gallon trash containers. A single 30-gallon trash container was identified as having a heat release rate of 300 kilowatts by the U.S. Department of Commerce National Institute of Standards and Technology Report of Test, FR 4018, "Heat Release Rate Tests of Plastic Trash Containers," dated April 24, 2003. The distance from the fire to target cables was assumed to be 11 feet based on the ground floor of the auxiliary building having a 19 foot ceiling, the tops of the laundry containers being three feet above the floor, and target cables being five feet down from the ceiling. The surface area of two laundry containers together was assumed to be 20 square feet. Based on these assumptions, the inspectors calculated the centerline plume temperature to be approximately 475 degrees Fahrenheit which was more than 100 degrees below the

damage threshold for thermoset cables (the type of cables used at Prairie Island Nuclear Generating Plant). As such, the inspectors determined that this issue was of very low safety significance (Green). Based on the lack of administrative procedures to control transient combustibles, the inspectors noted that the laundry carts could have been located in other plant areas which could have resulted in a secondary fire affecting safe shutdown equipment.

Enforcement: Title 10 CFR 50.48(b)(2) requires, in part, that all nuclear power plants licensed to operate before January 1, 1979, must satisfy the applicable requirements of Appendix R to this part, including specifically the requirements of Sections III.G, III.J, and III.O. Section III.G.2 of 10 CFR Part 50, Appendix R states, in part, that where cables or equipment, including associated non-safety circuits that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area outside of primary containment, one of the following means of ensuring that one of the redundant trains is free of fire damage shall be provided:

- a. Separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a three-hour rating. Structural steel forming a part of or supporting such fire barriers shall be protected to provide fire resistance equivalent to that required of the barrier;
- b. Separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area; or
- c. Enclosure of cable and equipment and associated non-safety circuits of one redundant train in a fire barrier having a one-hour rating. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.

The exemption for the lack of an automatic suppression system for fire areas 58 and 73, granted by letter dated January 9, 1984, stated, in part, that hazardous quantities of transient combustibles would not be expected in these fire zones.

Contrary to the above, as of January 27, 2004, the inspectors identified hazardous quantities of transient combustibles in fire areas 58 and 73. As such, the presence of hazardous quantities of transient combustibles in fire areas 58 and 73 was a violation of 10 CFR 50.48 and 10 CFR Part 50, Appendix R, Section III.G.2. In response to the inspectors' concerns, the licensee initiated corrective action document CAP035166 and removed the majority of the transient combustible materials from fire areas 58 and 73. This violation is associated with a finding that is characterized by the SDP as having very low risk significance (Green) and is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy. This violation was entered into the licensee's corrective action program as CAP035166. (NCV 05000282/2004002-02; 05000306/2004002-02)

.9 Compensatory Measures

a. Inspection Scope

The inspectors conducted a review to verify that adequate compensatory measures were put in place by the licensee for out-of-service, degraded or inoperable fire protection and post-fire safe shutdown equipment, systems, or features. The inspectors also reviewed the adequacy of short term compensatory measures to compensate for a degraded function or feature until appropriate corrective actions were taken.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed the corrective action program procedures and samples of corrective action documents to verify that the licensee was identifying issues related to fire protection at an appropriate threshold and entering them in the corrective action program. The inspectors reviewed selected samples of condition reports, work orders, design packages, and fire protection system non-conformance documents.

b. Findings

No findings of significance were identified.

4OA6 Meeting(s)

.1 Exit Meeting

On March 5, 2004, at the conclusion of inspection activities, the inspectors presented their initial findings to Mr. Werner and other members of licensee management at the Prairie Island Nuclear Generating Plant. The licensee did not identify any material reviewed during the inspection as being proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

R. Graham, Director, Operations
M. Huting, Director, NMC Programs
S. Northard, Director, Engineering
G. Salamon, Manager, Regulatory Affairs
E. Weinkam, Director, NMC Regulatory Services
M. Werner, Plant Manager
R. Womak, Manager, Program Engineering

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000282/2004002-01 05000306/2004002-01	URI	Cycling of Safety Injection Pumps for Fire Scenarios
05000282/2004002-02 05000306/2004002-02	NCV	Transient Combustibles Invalidated Exemption for Lack of a Fire Suppression System

Closed

05000282/2004002-02 05000306/2004002-02	NCV	Transient Combustibles Invalidated Exemption for Lack of Fire Suppression System
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Discussed

None

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety but rather that selected sections of 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.

Assessments

2001-004-06-011; Fire Protection; dated January 14, 2002

2002-004-6-008; Fire Protection and Appendix R, Safe Shutdown Analysis; dated November 12, 2002

2003-004-6-020; Fire Protection - Annual/Triennial and Biennial Assessment; dated December 9, 2003

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Cable Specification 2954; CV-31121 Control Cable (1C-2338); dated February 4, 2004

Cable Specification 2955; CV-31121 Control Cable (1C-2339); dated February 4, 2004

Cable Specification 2985; CV-31121 Control Cable (1C-2370); dated February 4, 2004

Cable Specification 5093; MV-32195, MV-32196 OP Cable (1C-5061); dated January 29, 2004

Cable Specification 6288; CV-31998 RSS Cable (1CA-21); dated January 30, 2004

Cable Specification 6306; CV-31998 RPS Cable (1CA-40); dated January 30, 2004

Cable Specifications 6359 - 6363; Various Control Cables; dated February 4, 2004

Cable Specification 6364; MV-32238 Control Cable (1CA-112); dated January 30, 2004

Cable Specification 6365; MV-32239 Control Cable (1CA-114); dated February 4, 2004

Cable Specification 6366; MV-32238 Control Cable (1CA-115); dated January 30, 2004

Cable Specification 6367; MV-32239 Control Cable (1CA-116); dated February 4, 2004

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Cable Specifications 7073 - 7077; Various Cables; dated January 29, 2004

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Cable Specification 7400; CV-31231 Control Cable (1CB-186); dated January 29, 2004

Cable Specification 7401; CV-31231 Control Cable (1CB-187); dated January 29, 2004

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Cable Specification 7970; MTR 16-3 12 AFW Pump Control Cable (1CB-920); dated January 30, 2004

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Cable Specification 10548; Loop 1L-488 S/G Level (WR) Cable (1CR-128); dated February 4, 2004

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Cable Specification 15257; MV-32196 Control Cable (1LA2-18A); dated January 29, 2004

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Cable Specification 16535; CV-31234 Control Cable (2CA-529); dated January 29, 2004

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Cable Specification 20678; MV-32197 Control Cable (2CA-172); dated January 29, 2004

Cable Specification 20809; CV-31234 Miscellaneous Relay Rack Cable (2CA-343); dated January 29, 2004

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Cable Specification 20934; CV-31234 OP Cable (2CA-491); dated January 29, 2004

Cable Specifications 20937 - 20943; Various Cables; dated January 29, 2004

Cable Specification 21298; MV-32198 Control Cable (2CB-136); dated January 29, 2004

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Cable Specification 29216; CV-31232 OP Cable (PA46246); dated January 29, 2004

Cable Specification 29217; CV-31232 OT 2L 46259 Cable (PA46259); dated January 29, 2004

Cable Specification 29224; SV-37035, 037, 039 ES 46282-46284 Cable (PA46282); dated January 29, 2004

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Corrective Action Documents

CAP016364; Plant Emergency Communication Outside Design Basis As Described in USAR; March 26, 2002

CAP025815; Inadequacies in the NFPA Code Compliance Review; dated October 16, 2002

CAP025909; Issues Identified During Fire Brigade Drill of 10/16/2002; dated October 22, 2002

CAP025964; Update Appendix R SSA and Incorporate the Results in the Applicable Procedures; dated October 25, 2002

CAP034221; Appendix R Manual Action Feasibility Has Not Been Adequately Demonstrated, dated November 24, 2003

CAP034223; SWI O-3 Lacks Administrative Controls to Maintain Breakers Open per the SSD Analysis; dated November 24, 2003

CAP035027; Potential Impact of a Fire in Fire Area 73 on the 12 MDAFWP (Appendix R); dated January 22, 2004

CR19981154; Plant Emergency Communication Outside Design Basis As Described in USAR; dated May 27, 1998

CR20014148; Evaluation Cannot Be Located Which Addresses CO₂ Migration Following a Relay Room Cardox System Actuation; dated May 9, 2001

EWR029371; Perform Study of Site Communications; dated November 24, 2003

OTH000165; Converted issue #20012926 Perform Safety Evaluation to Change Description of Emergency Communications Systems in the USAR Not Addressed by Proposed Mod.; dated March 23, 2002

OTH017153; Converted Issue #20012993 Submit Editorial Change to the USAR to Note Current Lack of UPS for Communications; dated March 30, 2002

OTH000719; Consider Adding the Communications System Changes in the Site Communication Study; dated March 23, 2002

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CA008435; Incorporate Action Identified LER 1-98-12, Supp. 3; dated February 11, 2004

CAP035118; USAR Update Not Incorporated; dated January 29, 2004

CAP035166; Storage of Combustibles in Safety Related Areas of Aux Bldg Need Evaluation; dated February 3, 2004

CAP035167; Trash Can Lids in SR Areas of Aux Bldg Do Not Meet NRC SER 9/6/79 Req; dated February 3, 2004

CAP035169; Evaluate Extinguisher Removal from Welding Rigs/Carts; dated February 3, 2004

CAP035171; Eval. Flammable Storage Cabinets for NFPA 30 Compliance and UL vs FM Approval; dated February 3, 2004

CAP035239; Fire Drill Criteria Involving the On-duty Fire Department; dated February 6, 2004

CAP035278; Procedural Guidance for Appendix R Safe Shutdown Database; dated February 10, 2004

CAP035316; Evaluation Required for Appendix R Required Conduit/Tray Supports; dated February 11, 2004

CAP035337; Evaluate GEN-PI-052 Not Being Provided to NRC at the Beginning of the FPTI; dated February 12, 2004

CAP035338; Procedure F5 Appendix D Not Updated per DCA96AC01; dated February 12, 2004

CAP035339; Use of an SI Pump for Reactor Makeup (Appendix R); dated February 12, 2004

OTH030575; Appendix R - Typo in Safe Shutdown Analysis; dated January 28, 2004

OTH030585; Drawing Discrepancy; dated January 28, 2004

OTH030770; Update GEN-PI-026, Addendum C58; dated February 10, 2004

OTH030804; Revise GEN-PI-026 to incorporate Design Change 00SI01; dated February 12, 2004

Drawings

FHA-029-2; Cable Tray System - Ground Floor Plan - Auxiliary Building Unit 2, Fire Area 73 to Col. 9; Revision 1

GEN-PI-052, Pages 1 through 34; Various Systems Figures; Revision 0

Engineering Analyses and Technical Evaluations

ENG-ME-049; Safety Injection Pump Room Cooling; Revision 1

ENG-ME-049; Safety Injection Pump Room Cooling; Revision 2

ENG-ME-094; FHA Combustible Loading Calculation; Revision 3

F5 Appendix E; Fire Protection SSA Summary; Revision 12

F5 Appendix F; Fire Hazard Analysis; Revision 19

GEN-PI-026; Safe Shutdown Analysis; Revision 0

GEN-PI-026; Safe Shutdown Analysis; Revision 1

GEN-PI-026; Safe Shutdown Analysis; Revision 2

GEN-PI-026; Safe Shutdown Analysis; Revision 3

NSPLMI-96001; Prairie Island Individual Plant Examination of External Events (IPEEE), Appendix B, Internal Fires Analysis; Revision 2

Safety Evaluation 483; Appendix R Safe Shutdown Analysis Implementation; December 30, 1997

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Letter from Northern States Power; Comparison of Existing Fire Protection Provisions to the Guidelines Contained in Standard Review Plan 9.5.1; dated December 8, 1976

Letter from Northern States Power; Fire Hazards Analysis Report; dated March 11, 1977

Letter from Northern States Power; NRC Staff Evaluation of Fire Protection Program; dated January 2, 1979

Safety Evaluation Report; License Amendment Nos. 39 (Unit 1) and 33 (Unit 2); dated September 6, 1979

Letter from Northern States Power; Fire Protection Safe Shutdown Analysis and Compliance with Section III.G of 10 CFR Part 50, Appendix R, Including Requests for Relief; dated June 30, 1982

Letter from Northern States Power; Clarification of Information Provided in Support of Request for Exemption from the Requirements of 10 CFR Part 50, Appendix R, Section III.G; dated October 22, 1982

Letter from Northern States Power; Review of Draft Evaluation on Appendix R Exemption Requests; dated February 17, 1983

Letter from Northern States Power; Request for Relief from the Requirements of 10 CFR Part 50, Section 50.48(b) for Fire Areas No. 58, 59, 73 and 74; dated March 11, 1983

Safety Evaluation Report; Exemption to Certain Requirements of 10 CFR Part 50 Appendix R Subsection III.G.2 in response to NSP letters dated June 30, 1982, and October 22, 1982; dated May 4, 1983

Letter from Northern States Power; Clarifying Information in Support of Exemption Requests for Fire Areas 58, 59, 73 and 74; dated May 16, 1983

Letter from Northern States Power; Supplementary Information to Exemption Request for Fire Areas 58, 59, 73 and 74; dated September 2, 1983

Safety Evaluation Report; Exemption to Certain Requirements of 10 CFR Part 50, Appendix R, Subsection III.G.2; dated January 9, 1984

Modifications

DC 00SI01; Design Change Package Boric Acid Reduction Phase 1A; Revision 1

Operability Reviews

OPR000474; Evaluation required for Appendix R required conduit/tray supports; dated February 11, 2004

OPR000476; Use of an SI Pump for Reactor Makeup (Appendix R); dated February 13, 2004

Procedures

1C18 AOP1; Makeup or Boration of the RCS Using a Safety Injection Pump; Revision 1

5AWI 3.13.0; Fire Protection Program; Revision 11

5AWI 3.13.2; Fire Preventive Practices; Revision 8

5AWI 6.1.6; Design Change Review and Approval; Revision 7

5AWI 6.1.10; Design Change Close-Out; Revision 3

F5 Appendix D; Impact of Fire Outside Control/Relay Room; Revision 12

RPIP1214; Respiratory Protection Equipment Testing; Revision 11

TCN 2004-0073; F5 Appendix D, Impact of Fire Outside Control/Relay Room; dated January 26, 2004

Safe Shutdown Analysis Block Diagrams

CKT-BKR 16-3; MTR 16-3; Revision 3

CKT-BKR 111E-1; MV-32025; Revision 0

CKT-BKR 111E-4; MV-32333; Revision 1
CKT-BKR 111E-17; MV-32238; Revision 2
CKT-BKR 111E-18; MV-32239; Revision 1
CKT-BKR 111J-34; MV-32016; Revision 0
CKT-BKR 111J; MCC 1K1; Revision 1
CKT-BKR 112L-22; MV-32195; Revision 1
CKT-BKR 121B-26; MV-32080; Revision 1
CKT-BKR 121E-7; MV-32027; Revision 0
CKT-BKR 121E-8; MV-32335; Revision 2
CKT-BKR 121E-17; MV-32381; Revision 2
CKT-BKR 121E-18; MV-32382; Revision 2
CKT-BKR 121J-34; MV-32017; Revision 0
CKT-BKR 121K-38; MTR 121K-38; Revision 0
CKT-BKR 122L-21; MV-32196; Revision 1
CKT-BKR 16-7; MTR 16-7; Revision 2
CKT-BKR 211J; MCC 2K1; Revision 0
CKT-BKR 211J-1; MTR 211J-1; Revision 3
CKT-BKR 212L-22; MV-32197; Revision 1
CKT-BKR 221B-26; MV-32183; Revision 1
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CKT-BKR 25-9; MTR 25-9; Revision 0
CKT-BKR 25-10; MTR 25-10; Revision 2
CKT-LOOP 1L-487; Loop 1L-487; Revision 0
CKT-LOOP 1L-488; Loop 1L-488; Revision 1
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CKT-PNL 12-1-A; CV-31154; Revision 1
CKT-PNL 13-27; CV-31121; Revision 0
CKT-PNL 151-17; CV-31153; Revision 1
CKT-PNL 162-1; SV-37036, SV-37038, SV-37040; Revision 2
CKT-PNL 171-4; CV-31232; Revision 3
CKT-PNL 181-4; CV-31231; Revision 3
CKT-PNL 191-1; CV-31998; Revision 1
CKT-PNL 191-3; SV-37035, SV-37037, SV-37039; Revision 2
CKT-PNL 251-10; SV-37091, SV-37093, SV-37095; Revision 2
CKT-PNL 262-1; SV-37092, SV-37094, SV-37096; Revision 2
CKT-PNL 271-4; CV-31234; Revision 3
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LOOP 39413; CV-39413 & CV-39421; Revision 0
LOOP 39414; CV-39414 & CV-39422; Revision 0
LOOP 39416; CV-39416; Revision 0

Vendor Manuals

Westinghouse Vendor Manual, P.O. No. 546-CAZ103319BN; Installation, Operation, and Maintenance Instructions, 4x6x9 Type CP High-Pressure Safety Injection Pump; dated May 10, 1974

LIST OF ACRONYMS USED

BTU	British Thermal Unit
CFR	Code of Federal Regulations
DPR	Demonstration Power Reactor
DRS	Division of Reactor Safety
FDT ^s	Fire Dynamics Tools
IMC	Inspection Manual Chapter
IR	Inspection Report
NCV	Non-Cited Violation
NRC	U.S. Nuclear Regulatory Commission
SDP	Significance Determination Process
SER	Safety Evaluation Report
SI	Safety Injection
URI	Unresolved Item