U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-282/88008(DRP); 50-306/88008(DRP)

Dockets No. 50-282; 50-306

License Nos. DPR-42; DPR-60

Licensee: Northern States Power Company 414 Nicollet Mall Minneapolis, MN 55401

Facility Name: Prairie Island Nuclear Generating Plant

Inspection At: Prairie Island Site, Red Wing, MN

Inspection Conducted: May 15 through June 25, 1988

Inspectors: J. E. Hard M. M. Moser

Seus Daugest

Approved By: B. L. Burgess, Chief Reactor Projects Section 2A

7/1/88



Inspection on May 15 through June 25, 1988 (Reports No. 50-282/88008(DRP); 50-306/88008(DRP)) Areas Inspected: Routine unannounced inspection by resident inspectors of

<u>Areas Inspected</u>: Routine unannounced inspection by resident inspectors of previous inspection findings plant operational safety, maintenance, surveillances, ESF systems, LER followup, spent fuel pool activities, design changes and modifications, licensee investigation of Ryerson Steel, and the NRC Chairman's visit.

Results: During this inspection period, both units operated continuously at 100% power and in general the plant continues to operate well. As noted in this and previous inspection reports, there continues to be a need for special emphasis regarding paying attention to details. In addition, another unplanned breaker actuation occurred as a result of activities in the substation and remains an area of concern. No violations of NRC requirements were identified during the course of this inspection.



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DETAILS

1. Persons Contacted

- *E. Watzl, Plant Manager
- D. Mendele, General Superintendent, Engineering and Radiation Protection
- R. Lindsey, Assistant to the Plant Manager
- *M. Sellman, General Superintendent, Operations
- D. Schuelke, Superintendent, Radiation Protection
- G. Lenertz, General Superintendent, Maintenance
- *K. Beadell, Superintendent, Technical Engineering
- M. Klee, Superintendent, Quality Engineering
- R. Conklin, Supervisor, Security and Services
- D. Vincent, Project Manager, Nuclear Engineering and Construction
- J. Goldsmith, Superintendent, Nuclear Technical Services
- A. Hunstad, Staff Engineer
- T. Amundson, Superintendent Training
- *A. Smith, General Superintendent, Planning and Services
- *M. Wadley, Shift Manager
- A. Vukmir. Site Services Representative, Westinghouse Electric Corp.
- D. Dilanni, License Project Manager, NRR

The inspectors interviewed other licensee employees, including members of the technical and engineering staffs, shift supervisors, reactor and auxiliary operators, QA personnel, Shift Technical Advisors, and Shift Managers.

*Denotes those present at the exit interview of June 27, 1988.

2. Licensee Action On Previous Inspection Findings (92701)

(Closed) 282/87012-02(DRP) Violation: Unit 1 Nuclear Instrumentation System (NIS) Off By 10% After Refueling.

An inaccurate estimate of post-refueling core neutron leakage resulted in a significant difference between actual and indicated reactor power during startup. As a result, the minimum technical specification for power range high flux low setpoint of the Nuclear Instrumentation System (NIS) was exceeded. Corrective actions have included comparing loop delta T's with nuclear instrumentation outputs during power escalations, nuclear modeling improvements which will be tested during the Unit 1 startup in Fall 1988, and an amendment to the technical specifications to raise the minimum low setpoint.

(Closed) 282/87003-02(DRP) Open Item: Battery Room Temperatures.

Modification 87Y84 was approved and issued on June 16, 1988 to cesign and install a new cooling system for battery room Nos. 11, 12, 21, and 22. This modification is designed to maintain battery room ambient





temperatures in the 59-85 degree F. range as recommended by battery manufacturers and is scheduled for completion prior to the upcoming Unit 1 outage.

(Closed) 282/88004-02(DRP) Open Item: Missing Data Point from Event V Valve Testing.

The previously missing data has been located and reviewed by the inspector. Results were acceptable.

(Interim report) Open Item (282/85024-04; 306/85022-04(DRP)): Post Accident Emergency Cooling Water Flow Requirement and Availability.

Discussions with the licensee have been conducted on this subject with the following results and conclusions:

a. 36" Emergency Cooling Water Line - The design basis for this line which provides the ultimate heat sink for the plant is to provide shutdown cooling following the design basis earthquake or the loss of Mississippi River Lock and Dam No. 3 for other reasons. A Loss of Coolant Accident in either unit is not assumed. Loss of offsite power may or may not be assumed and the licensee is researching this question. Failure of one diesel-driven cooling water pump (DDCLP) is assumed.

Successful plant cooling in this mode is dependent on automatic isolation of the turbine building cooling water loads. This isolation should occur when flow through a header increases to 15,500 gpm simultaneous with a drop in header pressure to 30 psi or less for more than five seconds. Failure to isolate under these conditions can cause DDCLP runout and damage and loss of this heat sink. With the current instrument settings for turbine building cooling water isolation, it is not clear that the automatic isolation would occur when needed. The licensee is reviewing this question. Additionally, the resident inspector has questioned whether river silting in the last 17 years has possibly isolated the emergency cooling water line intake from the main channel of the Mississippi River. This question will be investigated also.

b. Adequacy of Diesel-Driven Cooling Water Pumps - No emergency power is available to the electrically-driven cooling water pumps so in the event of loss of offsite power (LOSP), the diesel-driven pumps are the only source of cooling water. Other assumptions in the design basis are LOCA with safety injection in one unit, hot shutdown in the other unit, and failure of one DDCLP. Licensee's preliminary conclusion regarding this situation is that adequate cooling would be available. However, review of the DDCLP performance curves indicates that the cooling water header pressure will be less than assumed; therefore, cooling water flows will decay somewhat from their normal values. Licensee is reviewing the adequacy of these lower flows for the accident situation discussed here.





3. Operational Safety Verification (71707, 93702)

Both Unit 1 and Unit 2 were base loaded at 100% power except for reductions for surveillance testing.

The inspector observed control room operations, reviewed applicable logs, conducted discussions with control room operators, and observed shift turnovers. The inspector verified operability of selected emergency systems, reviewed equipment control records, and verified the proper return to service of affected components. Tours of the auxiliary building, turbing building and external areas of the plant were conducted to observe plant equipment conditions, including potential fire hazards, and to verify that maintenance work requests had been initiated for equipment in need of maintenance.

On May 25, 1988 with the Unit 1 operating at 100% power, the Unit 1 main 345 KV circuit breaker and associated motor-operated disconnects opened unexpectedly. This was caused by substation electrician activities during an attempt to update the substation electrical drawings and involved a loose terminal strip which was accidentally dislodged. The disconnects and circuit breaker were reclosed within 15 minutes. Review by the resident inspectors has revealed that:

- a. The plant operating staff had not been notified that this work was in progress in the substation.
- b. Written procedures for the work probably did not exist.
- c. Written permission to perform work in the substation had not been obtained.
- d. The plant was not providing direct control over access to the substation since the electricians had been issued a key to the substation gate.

The subject of control of work in the Prairie Island substation was discussed in a special meeting in Glen Ellyn, IL on January 7, 1988 between the licensee and RIII management. During this meeting the licensee discussed temporary procedures for control of such work while a long-term solution was being negotiated between the parties involved. These temporary procedures seem not to have been formalized. The breaker actuation discussed above is the latest in a long list of unplanned breaker actions and partial losses of offsite power to the plant as a result of activities in the substation.

On May 27, 1988, during the pre-operational surveillance test of the No. 12 diesel-powered cooling water pump, step 5.24 in the surveillance procedure which calls for valving back in the cooling water header pressure switch was not properly done. Also, the independent verification that this step was completed appears to have been done improperly and not in accordance with station procedures. These errors were discovered later in the test when the pump attempted to start when the control switches were placed in their normal operating position.





The majority of the surveillance test was rerun to assure that other procedural errors had not been made. None were found. Failure to follow the procedures is a violation of Technical Specifications Paragraph 6.5. Corrective action was taken immediately to correct the improper valve position, to retest the pump, and to remind all crews of the independent verification requirements. This violation meets the tests of 10 CFR 2, Appendix C, Section V.A.; consequently, no Notice of Violation will be issued. This matter is considered closed.

On June 15, 1988, while performing a test procedure on non-ESF dieselgenerator No. 4, plant 480 volt bus 420 was accidentally de-energized because of an error in the procedure. No safety significant electrical loads were affected. Voltage was restored to the bus in about three minutes. No followup inspection action will be required.

A special inspection of the Prairie Island Emergency Operating Procedures (EOP) was performed from June 13 through June 21, 1988 by a team of region based inspectors, contractors, and the participation of the senior resident inspector at Prairie Island. The multi-phased inspection included a detailed review of the EOPs, Prairie Island Procedure Generating Package, Westinghouse Owners Group (WOG) Emergency Response Guidelines (ERGS), deviations between these documents, 50.59 analysis for safety significant deviations, and the Prairie Island verification and validation program, a walkdown of select EOPs, exercising the EOPs on the Prairie Island simulator, as well as a human factors review of the EOPs. Specific details and results of the inspection can be found in Inspection Report No. 50-282/88010(DRS); 50-306/88010(DRS).

4. Maintenance Observation (62703)

Routine, preventive, and corrective maintenance activities were observed/reviewed to ascertain that they were conducted in accordance with approved procedures, regulatory guides, and industry codes or standards, and in conformance with Technical Specifications. The following items were considered during this review: the limiting conditions for operation were met while components or systems were removed from service, approvals were obtained prior to initiating the work, activities were accomplished using approved procedures and were inspected as applicable, functional testing and/or calibrations were performed prior to returning components or systems to service, quality control records were maintained, activities were accomplished by qualified personnel, radiological controls were implemented, and fire prevention controls were implemented.

Portions of the following maintenance activities were observed/reviewed during the inspection period:

- a. 22 Heater Drain Pump repair
- b. Control Room painting activities
- c. Cleaning of Old Screen House trash racks
- d. Trouble shooting and recalibration of Guardhouse explosives detector
- e. Gasket replacement, fuel oil storage tanks
- f. Maintenance of security fence



No violations or deviations were identified.

5. Surveillance (61726)

The inspector witnessed portions of surveillance testing of safetyrelated systems and components. The inspection included verifying that the tests were scheduled and performed within Technical Specification requirements, by observing that procedures were being followed by qualified operators, that Limiting Conditions for Operation (LCOs) were not violated, that system and equipment restoration was completed, and that test results were acceptable to test and Technical Specification requirements.

Portions of the following surveillances were observed/reviewed during the inspection period:

- SP 2088 Safety Injection Pumps Test
- SP 2002 Unit 2 Analog Protection Test
- SP 1106B No. 12 Diesel Cooling Water Pump Test
- SP 1728 Siren Cance! Test

No violations or deviations were identified.

6. ESF System Walkdown (71710)

The inspector performed a complete walkdown of the accessible portions of Unit 1 and Unit 2 Safety Injection (SI) systems. Observations included confirmation of selected portions of the licensee's procedures, checklists, plant drawings, verification of correct valve and power supply breaker positions to insure that plant equipment and instrumentation are properly aligned, and local system indication to insure proper operation within prescribed limits.

No violations or deviations were identified.

7. Spent Fuel Pool (SFP) Activities (86700)

As noted in the previous inspection report, preparations for the final phase of the fuel consolidation demonstration program (i.e. cage crushing) were completed and the contractor successfully completed the shearing and crushing of nine empty fuel assembly cages. At the end of this inspection period, cage crushing equipment decontamination and removal was underway and marked the end of the fuel consolidation demonstration program.

8. Licensee Event Reports Followup (92700)

Through direct observations, discussions with licensee personnel, and review of records, the following event reports were reviewed to determine





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that reportability requirements were fulfilled, immediate corrective action was accomplished, and corrective action to prevent recurrence had been accomplished in accordance with Technical Specifications:

(Closed) 282/87019-LL: Failure to Log Delta "I" With Computer Alarm Inoperable.

When the plant process computer failed, the reactor operator initiated the "Flux Deviation Log" and a reactor operator trainee began manually logging the axial flux difference (Deta "I") on an hourly basis. It was discovered that the wrong values had been logged (i.e., reactor power level in lieu of axial flux difference) for several hours. The axial flux difference values were properly logged thereafter until the plant process computer was restored. In addition, the flux deviation log form has been changed to clarify its use and all licensed operators have reviewed this event.

(Closed) 282/87013-LL: Unit 1 Reactor Trip on Startup.

This trip was the result of failure to block the power range high flux low setpoint prior to exceeding the setpoint during startup. Feedwater instabilities were being experienced at the time of trip. Corrective action involved adding a caution step in the startup procedure regarding the use of feedwater bypass valves plus re-emphasis during training on strict adherance to the startup procedure sequence.

(Closed) 282/87020-LL: Autostart of No. 12 Component Cooling Water Pump on Low Pressure.

The autostart of No. 12 component cooling (CC) water pump on low pressure was caused by a procedural inadequacy during prework testing for periodic maintenance on a motor operated valve. Corrective action included restoring the valve configuration, securing the No. 12 CC pump, and revising the pre-work procedure to manually start the No. 12 CC pump prior to valve testing. In addition, the procedures for pre-work testing of the remaining three valves were modified and the individuals involved and the systems engineer were reminded of the potential for CC pump autostarts during valve testing.

9. Design Changes and Modifications (37700)

On June 6, 1988, while scraping a small ground surface area in the station yard with a front loader in preparation for pouring a concrete pad, construction forces accidentally contacted a reach rod for an isolation valve in the well water system. This caused a major leak in the system necessitating shutdown of the system for several hours while repairs were completed. Plant operation was not adversely affected. Investigation revealed that the procedure for controlling excavations, NE&C SWI-8-P1-28, may not have been followed to the letter since, for example, the procedure specifies that normally all excavating will be done by hand when inside the protected area. Also, there was some initial confusion over the question of whether the work involved was covered by the







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excavating procedure. Additionally, plant drawings were found to be inaccurate since the drawings were checked before the scraping began. Though no safety systems were affected by this occurrence, this is a repeat instance of damage caused by construction excavation activities. See Inspection Report No. 50-282/86011(DRP); 50-306/86013(DRP). Emphasis placed on the June 6 occurrence by both plant and construction forces should help to prevent future problems of this nature. However, continued vigilance will be needed, especially as construction activities increase with future planned modification projects.

10. Licensee QA Investigation of Ryerson Steel

On March 23, 1988, the licensee's supplier QA branch found instances where Ryerson Steel had procured steel for safety related applications from unapproved sub-tier vendors. An investigation was conducted by the licensee to determine if there was reason to suspect that material from these unapproved sub-tier vendors was non-conforming.

Samples were taken from all available heats in storage of Ryersonsupplied material provided from unapproved sub-tier vendors and sent to an approved independent testing lab for metallurgical analysis. Results of the testing on eighteen samples of material has shown that although the material was provided from unapproved sub-tier suppliers, there is no reason to believe that any of the material is non-conforming.

11. NRC Chairman's Visit

On May 26, 1988, Chairman Zech and his technical assistants T. P. Gwynn and A. L. Vietti-Cock toured the Prairie Island plant and Training Center and had discussions with the licensee representatives and the NRC personnel listed previously. Licensee presentations were made on the following subjects: plant history, operating experience to date, plant organization, goals, strengths and weaknesses, SALP ratings, and outage experience. Some of the Chairman's comments during the visit were that the plant was clean though housekeeping could be improved; that the physical size of the EOF appeared small if consideration is given to the large numbers of people that could be involved in the EOF following an accident; attention to detail at all levels in the organization is important for assuring safe operation; and the licensee should carefully examine fuel rod consolidation in conjunction with other options that are available such as dry cask storage.

12. Exit (30703)

The inspectors met with the licensee representatives denoted in Paragraph 1 at the conclusion of the inspection on June 27, 1988. The inspectors discussed the purpose and scope of the inspection and the findings. The inspectors also discussed the likely information content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any document/processes as proprietary.

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