

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-282/89028(DRP); 50-306/89028(DRP)

Docket Nos. 50-282; 50-306

Licenses No. 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, Minnesota

Inspection Conducted: October 31 through December 11, 1989

Inspectors: P. L. Hartmann
T. J. O'Connor
J. M. Ulie

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

12/28/89
Date

Inspection Summary

Inspection on October 31 through December 10, 1989, (Reports No. 50-282/89028(DRP); 50-306/89028(DRP))

Areas Inspected: Routine, unannounced inspection by resident inspectors of plant operational safety, maintenance, surveillance, and fire protection.

Results: During this inspection period, Unit 1 operated continuously at 100% power and began coastdown on November 25. Full power operation was 81% at the close of the report period. Unit 1 experienced several power reductions due to the tripping and replacement of a breaker associated with the speed controls for the heater drain pumps. Associated activity levels remain less than 1% of Technical Specifications (TS) limits. Additional attention has been directed to the monitoring of the failed fuel rod with the discovery of a minor steam leak from the Unit 1 pressurizer manway (reference Paragraph 3b). At the end of the inspection period, Unit 1 had operated continuously for 142 days. Unit 2 operated continuously at 100% power during this inspection period. Unit 2 has reached 198 days of continuous operation at the end of the report period. Overall good plant performance was mitigated due to a number of unplanned automatic starts of the Control Room Ventilation System and Auxiliary Building Special Ventilation System.

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Of the four areas inspected, one unresolved item and one violation of NRC requirements was identified. However, in accordance with 10 CFR Part 2, Appendix C, Sections V.A. and V.G., a Notice of Violation was not issued. The violation involved the failure to declare the normal supply power to the D2 Emergency Diesel Generator to be a safe shutdown cable as required for Appendix R concerns. This matter is discussed in Paragraph 7.

DETAILS

1. Persons Contacted

E. Watzl, Plant Manager
#D. Mendele, General Superintendent, Engineering and Radiation Protection
M. Sellman, General Superintendent, Operations
G. Lenertz, General Superintendent, Maintenance
A. Smith, General Superintendent, Planning and Services
R. Lindsey, Assistant to the Plant Manager
D. Schuelke, Superintendent, Radiation Protection
G. Miller, Superintendent, Operations Engineering
K. Beadell, Superintendent, Technical Engineering
S. Schaefer, Superintendent, Technical Engineering
M. Klee, Superintendent, Quality Engineering
R. Conklin, Supervisor, Security and Services
M. Wadley, Shift Manager
G. Eckholt, Nuclear Support Services
#J. Leveille, Nuclear Support Services
#A. Hunstad, Staff Engineer

#Denotes those present at the exit interview of December 13, 1989.

2. Licensee Action on Previous Inspection Findings

a. (Closed) Open Item 282/89023-05(DRP): Investigation of Industrial Accidents

The inspector reviewed two industrial accident reports for events on September 12 and September 13, 1989, and one for an event on October 18, 1989, which involved a significant personnel injury. In each case, the investigation appeared thorough and personnel corrective actions were appropriate. Licensee management appears supportive of the corrective actions to prevent recurrence.

b. (Closed) Unresolved Item 306/89023-02(DRP): Review of Licensee Event Report 282/89017-LL.

A fire protection regional specialist reviewed the LER submitted concerning the routing path of the No. 2 Emergency Diesel Generator 125 VDC control power. This matter is discussed in Paragraph 6 of this report.

3. Operational Safety Verification (71707, 93702)

a. Routine Inspection

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, conducted tours of the auxiliary building, turbine building and external areas of the plant to observe plant equipment conditions, including potential fire hazards, and to verify that maintenance work requests had been initiated for the equipment in need of maintenance.

b. Unit 1 Primary Leakage Investigation

On November 9, 1989, the inspector accompanied licensee personnel on an inspection of the Unit 1 containment. The inspection was prompted due to increased levels in the 13 containment fan coil unit cooling coil condensate collection tank, increased sump A pumping frequencies and gas activity levels which had increased to approximately .001 microcuries/cc. The source of the leak could not be located. The fan coil units and the steam generators were eliminated as a source of the increased levels.

On November 14, 1989, the monthly containment inspection was conducted. In addition to the normal inspection areas, an entry was made into the pressurizer vault where a steam leak was noted to be originating from the insulation above the pressurizer manway.

On November 15, 1989, the inspector accompanied licensee personnel into the pressurizer vault where the insulation was removed from the pressurizer manway. The examination revealed minor traces of boric acid residue at locations around the manway. Other observations include: 1) that the exterior surface of the accessible bolts is dry and free of boric acid residue; 2) that evidence of steam impingement is present on the interior surfaces of the insulation; and 3) that one small area evidenced moist boric acid residue.

In accordance with the requirements of operating procedure H2 titled Program for Identification and Disposition of Small Reactor Coolant Leakage on Low Alloy Reactor Coolant Pressure Boundary Components, Rev. 0, the licensee has performed an evaluation which examined the leak rate, boric acid concentration of deposited fluid, potential corrosion rate, impact on reactor coolant system (RCS) integrity, action plans, and interim monitoring. The inspectors attended the Operations Committee (OC) meeting which reviewed this safety evaluation, November 17, 1989. The OC found the evaluation adequate to justify operation until the upcoming refueling outage. The inspections determined the carbon steel bolts used to secure the pressurizer manway will be inspected as per ISI requirements (ultrasonic and wet magnetic particle) since the bolts will be removed to allow the pressurizer manway to be lifted off. The inspectors and regional management found the evaluation and course of action adequate.

The inspector accompanied the system engineer on November 28, 1989, on a containment entry to reinspect the pressurizer manway and there were no indications that the amount or nature of the suspected primary leakage had increased. Towards the end of the inspection period, the trend of the amount of primary leakage for Unit 1 improved.

c. Plant Control Room Simulator Evaluation

On November 18 and 19, 1989, a special evaluation was conducted of the Prairie Island Unit 1 control room simulator. A team of NRC personnel performed the evaluation which included: the Senior and Resident Inspector, the Projects Branch 2 Chief, the Projects Section 2B Project Engineer and the Monticello (backup site) Resident Inspector.

The following activities were conducted:

- Walkthrough of Operations Manuals for purpose and location
- Review of control board major components
- Performance of reactor startup to the point of adding heat (POAH)
- Performance of surveillance tests of the following safeguard components:
 - diesel generator
 - auxiliary feedwater pump

Real time and slow time demonstrations of the major accidents including discussions of the events and Emergency Operating Procedures:

- ATWS (Anticipated Transient Without Scram)
- Steam Line Break
- Small and Large Break Loss of Coolant Accident
- Steam Generator Tube Rupture
- Loss of All A.C. Power
- Control Room Evacuation

The simulator instructors were knowledgeable of: procedure usage, technical specifications, simulator operations, and actual plant operation. The senior simulator instructor had seven years experience as an onshift licensed control room operator. This individual's contribution to effective simulator training was readily apparent. The inspector concluded the simulator and procedures used were effective to train operators and simulator accident conditions on a real time basis.

Several questions were raised by the inspectors during this evaluation which were answered by the instructors. Listed below are questions which required further licensee review.

- (1) The Unit 1 steam generator level indicator for the A train hot shutdown panel (HSD) was not labeled or scaled appropriately in the simulator. The inspector verified that the in-plant hot shutdown panels are labeled adequately. This simulator condition was communicated to the licensee.
- (2) During in-plant review of the HSD equipment, the inspector noted the several labels for AFW local operators were previously labeled for another application. The lettering was apparently painted over in an effort to use the label in a different application, which is now peeling off.
- (3) The A train HSD panel's open indicator is amber versus the red open indication for the Unit 2 letdown isolation valve (CV-31230). This in plant condition is not consistent with any open indication.
- (4) The inspectors questioned the method, frequency calibration, and surveillance of the HSD Panel equipment. As a followup, the inspector discussed the testing of this equipment with the Superintendent of Technical Engineering and a testing control inadequacy was determined. The licensee determined that the source range detector indication is not part of a surveillance of calibration program. The licensee initiated efforts to create the appropriate procedures. The inspector also questioned the testing of remote controls in the HSD panels. This determination is under review by the licensee. This issue is unresolved, pending licensee and inspector review of the matter. (Unresolved Item 282/89028-01; 306/89028-01(DRP))

d. Engineered Safeguards Feature (ESF) Actuations

The control room ventilation system was automatically started on five occasions during this report period. All were attributable to operability/reliability problems with the chlorine monitors. The licensee has initiated plans to increase the reliability of chlorine detection. These plans were documented in a memo to W. L. Axelson, Chief, Projects Branch 2. The event dates were November 9, 17, 20, 30, and December 8, 1989.

An automatic start of the 121 Auxiliary Building Special Ventilation Zone (ABSVZ) System occurred on November 12, 1989. The cause was a spike in the detection circuitry for radiation monitor 2R37. The licensee is also pursuing actions to improve the reliability of radiation monitors. The above events will be reported in several LERs.

No violations, deviations, or open items were identified. An unresolved item was identified in Section 3.c.4 above.

4. Maintenance Observation (71707, 37700, 62703)

Routine, preventive, and corrective maintenance activities were observed to ascertain that they were conducted in accordance with approved procedures, regulatory guides, industry codes or standards, and in conformance with Technical Specifications. The following items were considered during this review: adherence to limiting conditions for operation 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 during the inspection period:

- Replacement of Charcoal Trays on Various Safeguards Filters
- Troubleshooting on Chlorine Monitors
- a. Emergency Diesel Generator D-2

The inspector monitored activities associated with the replacement of the exhaust manifold gaskets and other minor corrective actions on D2. The gasket replacement involved the installation of newly designed gaskets. The inspector reviewed this modification package and determined its contents to be adequate. Maintenance activities were conducted in accordance with good practices, under close supervision, and with the assistance of the system engineers. The appropriate technical manual was present at the job site. The inspector also observed the removal of the diesel from service, noting good practices by the operators in the area of time separation for independent verification.

b. Diesel Driven Cooling Water Pump No. 22

The inspector monitored activities associated with the yearly preventive maintenance (PM) on the Diesel Driven Cooling Water Pump No. 22. The licensee conducted this PM in conjunction with minor modifications in a very expeditious and well coordinated manner. These activities were also conducted according to good maintenance practices under close supervision and with the assistance of the system engineers.

c. Loss of Unit 2 Feedwater Heater Pump Speed Control

On November 6, 1989, nonsafety-related breaker B1 on motor control center (MCC) 2D Bus 1 tripped open which resulted in a loss of power to MCC 2DA Bus 1. Breaker B2 on MCC 2DA Bus 1 supplies power to the heater drain pump speed controls for Unit 2. The impact of the

resulting transient, the rapid loss of approximately 50 MW, was minimized by the licensed operators quick response. Troubleshooting determined that the fault originated in an extension cord fed from breaker B3 on MCC 2DA Bus 1. Breaker B3 supplies power to three welding receptacles located in the turbine building. The troubleshooting determined that this breaker was not coordinated for instantaneous over current conditions with the upstream breaker B1 on MCC 2D Bus 1. In response to this condition, the licensee has placed all breakers supplying power to welding receptacles under administrative control.

On November 7, 1989, nonsafety-related breaker B1 on MCC 2D Bus 1 again tripped open, resulting in a loss of power to MCC 2DA Bus 1 and the rapid loss of approximately 50 MW. Again the impact on the plant was minimized as a result of the operators quick response to the transient. Troubleshooting determined that the fault originated in a transformer fed from breaker A4 on MCC 2DA Bus 1. Troubleshooting also determined that this breaker was not coordinated for instantaneous over current conditions with the upstream breaker B1 on MCC 2D Bus 1. In response to these transients, the licensee has initiated a modification designed to power the heater drain pump speed controllers from separate MCCs. Long term plans will examine the feasibility of eliminating nonsafety-related sub fed MCCs and their accompanying lack of instantaneous over current circuit coordination protection. Current plant modifications associated with the installation of two new emergency diesel generators include the elimination of sub fed safety-related MCCs. The inspectors will continue to monitor licensee's activities in this area.

d. No. 12 Auxiliary Feed Pump (AFP) Suction Line Semi-annual Flush

The inspector observed portions of Preventive Maintenance Procedure (PM) 3134-1-12 (Rev. 3) while flushing the cooling water (from the Mississippi River) to the 12 AFW pump suction. The flush showed no blockage and a near total absence of any marine life. The operators performing the activity were generally knowledgeable in performance of their duties.

The inspector noted two anomalies in performance of this PM procedure. First, one operator inappropriately initialed independent verification steps (Steps 6.28 and 6.29). The operator realized the error and lined out his initials. The steps were later independently verified correctly. The root cause of this anomaly was in part due to inconsistent placement of initial spaces for independent verification, within this same procedure. In some places, the independent verification space is conspicuously placed to the left of the operator's initial space; in other places in the same procedure the independent verification step is below other steps appearing as any other operator initial space. This inconsistency was discussed with the acting General Superintendent of Operations (GSO).

The second anomaly was Step 6.31 which states "Clear isolation cards from MV-32335 and return to normal." The operator was unsure if this step meant the valve should be repositioned locally or returned to remote and the control room should position the valve. The operator appropriately contacted the control room for clarification of the procedure step. The proper interpretation was allowing the control room to position the valve. This procedure step vagueness was discussed with the acting GSO.

No violations, deviations, unresolved, or open items were identified.

5. Surveillance (61726, 71707)

The inspector witnessed portions of surveillance testing of safety-related 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 and include:

- SP 2035A, Reactor Protection Logic Test, Rev. 16
- SP 1093.2, D2 Diesel Generator Manual and 4 KV Voltage Rejection-Restoration Scheme Test, Bus 26, Revision 36
- SP 1003, Analog Protection Functional Test, Revision 20
- SP 1100, No. 12 Motor Driven Auxiliary Feedwater Pump Test, Rev. 27
- Regarding SP 1100, the inspector observed the test from the pump location. The inspector observed the operator's proper questioning of the suction pressure in Step 7.8 which was above the normal stated value. The operator discussed this indication (pegged high on a 0-10 psig scale) with the control room and the shift supervisor directed the pump casing drain to be opened. Following a several minute flush, the drain was closed and pump suction pressure indicated on scale.

Following the pump run, the inlet to the lube oil cooler (CV 31154) failed in the open (safeguards) position. The cause was a failed solenoid which prevented valve closure. These two anomalies were not noted in the comments section, until the inspector discussed the issue with the acting GSO. The items were added to the comment section. A work request was written on CV 31154.

No violations, deviations, unresolved, or open items were identified.

6. Licensee Event Report Followup

(Closed) Licensee Event Report (282/89017-LL; 306/89016-LL):

LER 89-17 was issued to document the licensee's discovery, during an Appendix R review on September 14, 1988, that a condition existed in which a Design Basis Fire could disable both Emergency Diesel Generators. Specifically, the licensee identified that in June 1984, the licensee failed to declare Cable 2DCB-71, which is the normal supply of control power to D2 Emergency Diesel Generator, to be a safe shutdown cable. Thus, Cable 2DCB-71, which is routed through a fire area (Fire Area 32) that also contains control power cabling to the D1 Emergency Diesel Generator, was not fire protected. A Design Basis fire in fire area 32 could have disabled both Emergency Diesel Generators. The failure by the licensee modification process to require the review of modifications for Appendix R compliance is considered a violation. However, the licensee determined that the "B" train bus from the D4 Non-Safeguard Standby Emergency Diesel Generator would have been available to power required support systems to achieve a safe plant shutdown. Additionally, it was confirmed by the NRC that emergency operational procedures were in place that would have provided the operators the necessary direction for restoring power from the D4 Non-Safeguard Standby Emergency Diesel Generator. This violation meets the tests of 10 CFR Part 2, Appendix C, Section V.G; consequently, no Notice of Violation will be issued, and this matter is considered closed.

The cause of this event condition was the lack of adequate administrative control procedures over the licensee's modification process. Specifically, modifications were made without a review for compliance to Appendix R. In addition, modifications were completed without revisions to applicable drawings to reflect the modifications.

As part of the licensee's corrective action, on September 14, 1989, the licensee shifted the Emergency Diesel Generator Switch to the standby position. In this position, the control power for EDG 2 is supplied from a cable which conforms to Appendix R requirements. Administrative Control Procedures were revised in July and October 1984 to correct the inadequate design control program. Internal technical reviews of the 10 CFR 50 Appendix R design versus the as-built conditions will be completed to assure that all discrepancies are identified and corrected.

7. Meeting With Local Official

On November 21, 1989, the inspectors met with the Honorable Joannell Drystad, Mayor, City of Red Wing. The inspectors briefly discussed the resident inspector program, current plant activities, and the upcoming Unit 1 refueling outage. Matters of mutual interest were discussed which included emergency planning and the licensee's plans for spent fuel above ground cask storage.

8. Violations For Which A "Notice of Violation" Will Not Be Issued

The NRC uses the Notice of Violation as a standard method for formalizing the existence of a violation of a legally binding requirement. However, because the NRC wants to encourage and support licensee's initiatives for self-identification and correction of problems, the NRC will not generally issue a Notice of Violation for a violation that meets the tests of 10 CFR 2, Appendix C, Section V.G. These tests are: 1) the violation was identified by the licensee; 2) the violation would be categorized as Severity Level IV or V; 3) the violation was reported to the NRC, if required; 4) the violation will be corrected, including measures to prevent recurrence, within a reasonable time period; and 5) it was not a violation that could reasonably be expected to have been prevented by the licensee's corrective action for a previous violation.

In addition, 10 CFR 2, Appendix C, Section V.A. has been changed to provide the staff with the flexibility not to issue a Notice of Violation for inspection findings which involve isolated violations at a Severity Level V. Such violations are by definition of minor regulatory concern.

Violations of regulatory requirements identified during the inspection for which a Notice of Violation will not be issued are discussed in Paragraph 6.

9. Exit (30703)

The inspectors met with the licensee representatives denoted in Paragraph 1 at the conclusion of the inspection on December 13, 1989. 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 documents or processes as proprietary.