U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-282/78-19; 50-306/78-19

Docket No. 50-282; 50-306 License No. DPR-42; DPR-60

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

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

Inspection At: Prairie Island Site, Red Wing, MN

Inspection Conducted: November 14 and 15, 1978

Inspectors: J. Hughes 12/26/78

RF Warnick for
C. D. Feierabend 12-26-78

Approved By: R. L. Spessard, Chief 12/26/78
Engineering Support Section 1

Inspection Summary

Inspection on November 14 and 15, 1978, (Report No. 50-282/78-19; 50-306/78-19)
Areas Inspected: Routine, announced inspection of LER 78-16 and IE Bulletins and Circular followup relative to qualification of electrical equipment. The inspection involved 12 inspector-hours onsite by two NRC inspectors.
Results: No items of noncompliance were identified.

DETAILS

1. Persons Contacted

*E. Watzl, Superintendent, Plant Engineering and Radiation Protection
*J. L. Hoffman, Superintendent, Technical Staff
*A. D. Smith, Production Engineer
*D. Mendele, Superintendent, Operations Engineering
J. A. Laveille, Quality Assurance Engineer
R. Olschlager, Instrument and Control Coordinator

*Denotes those attending exit interview.

2. Licensee Action on IE Bulletin No. 78-02

The RIII inspector reviewed the licensee's response to IE Bulletin No. 78-02 and verified that: licensee management forwarded copies of the bulletin to appropriate onsite management representatives; information discussed in the licensee's response was accurate; and action taken; if any was as described in the response.

The RIII inspector determined that the licensee had performed a systematic review of the facility to ensure that no unprotected terminal blocks of any type are used on safety-related systems within the containments of Unit 1 and Unit 2. The licensee stated that General Electric epoxy (74010) and resin (74010A) were utilized on terminal block connections to afford further environmental protection for a LOCA condition.

A GE letter to NSP dated November 21, 1978, was received by the licensee subsequent to the completion of this inspection. The information in this letter, which included radiation test results, was provided by Shell Chemical Company to assure the qualification of the epoxy and resin. The RIII office received the information via the NRC Resident Inspector. The RIII inspector has no further questions on this matter.

3. Licensee Action on IE Circular No. 78-08

a. The Region III inspector verified that the licensee has reviewed qualification requirements and other areas of concern identified in the circular, as pertains to appropriate documentation for safety-related electrical components for his facility.

b. The Region III inspector determined that the licensee had assigned the responsibility for review of references listed in the circular and that the licensee had compared his plant with lessons identified in the references.

c. The Region III inspector reviewed documentation for the following components:

(1) Connectors (IE Bulletins 77-05 and 77-05A) were previously inspected, and the results are documented in NRC Inspection Report Nos. 50-282/78-04 and 50-306/78-05 dated June 5, 1978.

(2) Penetrations (IE Bulletin 77-06) were previously inspected, and the results are documented in NRC Inspection Report Nos. 50-282/78-04 and 50-306/78-05 dated June 5, 1978.

(3) Limit Switches (IE Bulletin 78-04) were previously inspected, and the results are documented in NRC Inspection Report Nos. 50-282/78-07 and 50-306/78-09 dated June 30, 1978.

(4) Cable splices were previously inspected, and the results are documented in NRC Inspection Report Nos. 50-282/78-04 and 50-306/78-05 dated June 5, 1978.

(5) Electrical Cables were reviewed by the RIII inspector during this inspection, and the findings are as follows:

(a) Boston Insulated Wire and Cable Company (Bostrad 7) certified test reports, numbers B901 and B904, for instrument cables include test results for vertical flame, radiation, chemical spray, pressure and temperature tests. The RIII inspector determined that the test results were satisfactory.

(b) Kerite Cable test reports included: Franklin Institute Report F-C2737, Qualification Tests of Electrical Cables Under Simulated Post-Accident Reactor Containment Service Conditions, dated April 15, 1970, Report on the Effects of Gamma Radiation and Autoclaving on Kerite Power and Control Cables, and Kerite Flame Test conducted on Control and Power Cables from December 1974 through August 1975. The test reports include

test results for vertical flame, pressure, temperature, steam, radiation and chemical spray tests. The RIII inspector determined that the test results were satisfactory.

(c) Okonite cable and splice certifications included radiation, steam, pressure, chemical spray and temperature. The RIII inspector determined that the test results were satisfactory.

(6) Electrical transmitters were reviewed by the RIII inspector during this inspection, and the findings are as follows:

(a) During review of electrical transmitters in reference to IE Circular 78-08, the licensee determined that Foxboro type E11GM transmitters for pressurizer pressure were not environmentally qualified, i.e., did not have Foxboro's maximum credible accident (MCA) modification. Licensee Event Report (LER) No. P-RO-78-16 dated August 21, 1978 describes this problem. The transmitters were replaced by the licensee with Foxboro E11GM transmitters having the (MCA) environmental qualification modification. The results of the licensee's investigation of this problem are discussed in Paragraph 4 of this report.

Documents for the replacement transmitters included, Westinghouse WCAP-8451, titled "Topical Report Seismic and Environmental Testing of Foxboro Transmitters" dated July, 1975. Test reports for the MCA/RRW type transmitters included radiation, chemical spray, pressure, steam and temperature test results. Prior to the inspection, RIII was advised that Foxboro type E11GM transmitters are under a generic review by NRR. The inspector has no further questions on this matter.

(b) The RIII inspector reviewed Westinghouse WCAP 7410-L for the Barton Model 386 transmitters, used for the pressurizer level sensors. Environmental testing in steam, pressure and temperature was performed by the Franklin Institute Research Laboratories (FIRL) and is documented in their final reports F-C2639 and F-C2667. The radiation testing of the transmitters

was conducted by Westinghouse. Prior to the inspection, Region III was advised that Westinghouse WCAP 7410-L is under a generic review by NRR. The inspector has no further questions on this matter.

(7) Reactor Containment Fan Cooler (RCFC) motors were reviewed by the RIII inspector during this inspection, and the findings are as follows:

Westinghouse WCAP-7829, Section 3 includes equipment tested as follows: heat exchanger motor; force cooled motor; thermalastic epoxy insulation; and lubricant. Section 5 includes test results on radiation, pressure, temperature, steam, aging and chemical spray. The inspector has no further questions on this matter.

(9) Dome Recirculation Fan Motors were reviewed by the RIII inspector during this inspection, and the findings are as follows:

Joy Manufacturing Company test report No. X-411 dated October 23, 1972 includes test results on radiation, temperature and pressure effects on epoxy coated RH type insulation and Chevron BRB No. 2 lubricant for the fan motors. The RIII inspector has no futher questions on this matter.

(10) ASCO solenoid valves of various models, located inside the containment and used for containment isolation and containment fan cooler damper operation, were reviewed by the RIII inspector during this inspection, and the findings are as follows:

The licensee stated that the solenoids are Class H type insulation and that this insulation is good up to temperature of 350°F. Westinghouse supplied solenoid valves use Nema type 1 enclosures. The licensee also stated that the eight (8) normally open solenoid valves will fail in the closed position upon loss of power, air or damaged coil. The inspector has no further questions on this matter.

(11) Fuse holders located in a steam environment were reviewed by the RIII inspector during this inspection, and the findings are as follows:

Busman KLM type 6 amp fuse with a "Tkon" waterproof fuseholder type HEB-A was tested to Mil-Std-202D Method 104A which includes an immersion hot bath at a temperature of 65°C, followed by a cold bath of 25°C, then saturated in a solution of sodium chloride and water and exposed to a radiation dose rate of 20 mR/hr. The inspector has no further questions on this matter.

(12) Containment Sump Level switches were reviewed by the RIII inspector during this inspection, and the findings are as follows:

Magnetrol Model A-153 FEP TDM type level switches were tested by the Environmental Testing Corporation, and the results are documented in Test Report No. 9306 dated April 26, 1972, which includes steam, temperature and pressure test results. Magnetrol certificate of conformance dated May 9, 1972, has environmental data for radiation and chemical spray. The inspector has no further questions on this matter.

(12) Limitorque Valve Operators were reviewed by the RIII inspector during this inspection, and the findings are as follows:

Franklin Institute Research Laboratories test report F-C2232-01 dated November 1968, titled "Limitorque Valve Operator under a simulated Reactor Containment Post-accident Steam and Chemical Environment" indicates test conditions of saturated steam pressure to 60 psig and boric acid spray (1.5% solution by weight, buffered to a PH of 7.85 with sodium hydroxide) simulating those existing in water-moderated reactor containments following a loss of coolant accident.

Westinghouse WCAP-7410-L Section 5 states that "environmental testing in the steam, pressure, temperature and chemistry environments were performed on valve operators with both Class H and Class B insulation on the motor. In addition to post accident steam and chemical tests, a radiation test was performed on a production valve motor with Class B insulation to a level of 2×10^8 rads.

Westinghouse WCAP-7410-L is under a generic review by NRR, as identified in subparagraph (6)(b) above. The inspector has no further questions on this matter.

4. LER 78-16 (August 21, 1978) - Pressurizer Pressure Transmitters

The inspector reviewed events leading to the licensee's determination that pressurizer pressure transmitters installed on Units 1 and 2 were not environmentally qualified to the level stated in the FSAR, as well as actions to resolve and correct the problem.

The inspector reviewed Westinghouse Specification Sheets 4.40, revision 2 dated November 5, 1970, 4.50b and 4.50c; Westinghouse Quality Certification Releases (QCR) for the transmitters dated November 20, 1970 for Unit 1 and November 1, 1971 for Unit 2; calibration and functional test data; Plant Review Committee meeting minutes for August 17, 1978; Work Request Authorizations (WRA) B4187-RP-Q, B4188-RP-Q, B4189-RP-Q, B4191-RP-Q, B4192-RP-Q and B4193-RP-Q; and a draft copy of the licensee's internal report of the matter. The inspector also interviewed members of the plant engineering, QA, and I&C groups.

In response to IE Circular 78-08, Environmental Qualification of Safety Related Electrical Equipment at Nuclear Power Plants, the licensee was in the process of examining safety related instruments inside containment. During this examination, a technician observed that the pressurizer pressure transmitters did not have the identifying letters "MCA" that had been observed on similar transmitters supplied by the same manufacturer, the Foxboro Company (Foxboro).

The licensee immediately contacted both Westinghouse and Foxboro representatives on August 7, 1978, to determine the extent of environmental qualification of the installed instruments. Having determined the transmitters were not qualified, emergency procurement action was taken to obtain fully qualified replacements.

A safety evaluation which assumed the pressurizer pressure transmitters did not provide the appropriate signals was performed by Westinghouse. It concluded that continued operation of the units would not pose a substantial safety hazard to the public.

On August 9, 1978, qualified replacement transmitters were received, inspected, calibrated, and installation begun in accordance with the licensee's QA program. Replacement of all transmitters required to perform in the accident environment was completed on August 10, 1978.

The licensee reported that Westinghouse provided the specification including environmental qualification requirements and the purchase order to Foxboro for the original transmitters. The licensee pursued the problem with Foxboro and determined that the original transmitters had been properly identified on the initial production records but that a misrouting of the transmitters during their fabrication omitted the special transmitter manufacturing department which would have performed the MCA modification during final assembly. This mistake was not caught by Foxboro and the transmitters were sent to NSP without the MCA modification being made.

When the transmitters were received onsite, Westinghouse and the NSP instrument shop personnel inspected the transmitters for damage, checked the serial numbers against those listed on the specification sheets, and they completed the QCR's thus releasing the equipment for installation.

According to the licensee Fosboro reviewed records of other transmitters built during that and later time frames and found no similar mistakes. Foxboro indicated to the licensee that their documentation system had been improved and that it affords more checking of the work sheets and factory production sheets.

No similar events were identified during the licensee's review pursuant to IEC 78-08. The licensee's QA program which includes reviewing the vendor's qualifications and his QA program should preclude this from happening now.

No items of noncompliance or deviations were identified by the inspector. These findings have been forwarded to IE for their review.

5. Exit Interview

The inspectors met with the licensee representatives (denoted in Persons Contacted paragraph 1) at the plant site on November 15, 1978. The inspectors summarized the scope and findings of the inspection.