U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-282/85019(DRSS); 50-306/85018(DRSS)

Docket Nos. 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, Units 1 and 2

Inspection At: Prairie Island Site, Red Wing, MN

Inspection Conducted: September 17-19, 26, October 1, 1985

L. J. Hueter

Inspector: L. J. Hueter 10/9/85
Date

M. J. Oestmann

M. J. Oestmann 10/9/85
Date

M. C. Schumacher

Approved By: M. C. Schumacher, Chief 10/5/85
Independent Measurements and Date
Environmental Protection Section

Inspection Summary

Inspection on September 17-19, 26, and October 1, 1985 (Report Nos. 50-282/85019(DRSS); 50-306/85018(DRSS))

Areas Inspected: Routine, unannounced inspection of gaseous and liquid radioactive programs including: effluent releases, records and reports of effluents, gaseous effluent filtration, and audits/appraisals. The inspection involved 19 inspector-hours onsite by one NRC inspector. An in-office review of the radiological environmental monitoring programs was also conducted.

Results: One violation was identified (failure to follow procedures associated with restoration of a liquid radwaste system following maintenance and with a subsequent liquid radwaste release from the system).

DETAILS

1. Persons Contacted

M. Balk, Superintendent of Operations
[3]B. Clark, Administrator, Radiological Environmental Monitoring Program, NSP Corporate Office
J. Friedrich, Engineer
[1] T. Gatten, Chemistry Coordinator
[1] A. Hunstad, Staff Engineer
[1] D. Larimer, Radiochemistry Supervisor
[1] D. Mendele, Plant Superintendent, Engineering and Radiation Protection
[1 2] D. Schuelke, Superintendent, Radiation Protection
B. Stephens, Lead Senior Production Engineer
G. Thayer, Plant Attendant
E. Watzel, Plant Manager

[1] J. Hard, NRC Senior Resident Inspector
[1] M. Moser, NRC Resident Inspector

[1]Attended the September 19, 1985, exit meeting.
[2]Telephone conversation, September 26, 1985.
[3]Telephone conversation, October 1, 1985.

2. Gaseous Effluents

The inspector reviewed selected records of radioactive gaseous effluent sampling and analysis for 1985 to date and the semiannual effluent report for the first half of 1985. The pathways sampled and analysis performed appear to comply with the requirements of Technical Specification Table 3.9-2.

The six basic release paths for gaseous effluent are the shield and auxiliary building vents of Units 1 and 2 and the spent fuel pool and radwaste building ventilation systems. Other special ventilation/ filtration systems (including containment vent and purges), when in operation, exhaust through the shield building ventilation system.

The licensee collects continuous particulate and iodide samples from the six release paths. These samples are removed weekly (more frequently if required by technical specification due to existing conditions) and analyzed by gamma spectrometry. In addition, the particulate filters are analyzed monthly for gross alpha activity and are analyzed quarterly by a contractor for the pure beta emitters, Sr-89 and Sr-90. No pure beta emitters were detectable on filters analyzed during the first half of 1985.

Weekly grab samples of gas are also collected from each of the six release paths and analyzed for noble gases. Concentrations are generally below detection limits. Occasionally, Xe-133 is identified (and quantified) and on rare occasions Xe-135 has been identified, but not

recently. In addition, quantification of released activity from waste gas decay tanks and containment venting and purges is based on measured concentrations (prior to the release) and release volumes. In addition, the noble gas monitor charts of each pathway are observed for any peaks not otherwise accounted for and identified releases are quantified based on the efficiency factor of the monitor. For the latter quantifications, the isotopic distribution is assumed to be that of the most recent (during the past month) grab sample having identifiable activity. Otherwise, the isotopic distribution of the standard gas mixture specified in the offsite dose calculation manual (ODCM) is assigned.

For quantification of tritium in gaseous effluents, silica gel is used to collect continuous monthly samples from each in service release path. For special releases, such as containment purges, quantification is based on prerelease analysis and volume released. Liquid scintillation counting is used for the analysis. The licensee has just received a new liquid scintillation counter, Beckman LS 5801, which is reported to have an efficiency of up to 60% (about triple that for the previous instrument) and has many computerized features.

In addition to the six basic release paths, gaseous effluents are quantified for steam releases (from steam generators) associated with reactor trips or for steam releases associated with some planned reactor cooldowns. Releases are quantified based on analysis of liquid samples from the steam generator(s) and volume of liquid released.

During the first six months of 1985, about 17.1 curies of noble gas and 3.43E-3 curies of I131 were released in gaseous effluents from both units combined. From this activity, the calculated maximum organ dose to any individual beyond the site boundary was 0.25 mrem.

No violations were identified.

3. Liquid Effluents

The inspector reviewed selected records of radioactive liquid effluent sampling, analysis, and monitoring for 1985 to date and the semiannual effluent report for the first half of 1985.

The two ADT monitor tanks and the three CVCS monitor tanks (all common to both reactor units) are the primary release sources for batch liquid releases. Seven other tanks with capability for direct batch releases, but not normally used as such, are two steam generator blowdown (SGB) holdup tanks, two SGB monitor tanks (one each for each unit), two waste condensate receiver tanks (each common to both units) and the aerated drain monitor tank.

The four paths considered as continuous releases are the steam generator blowdown from either unit (when operating) and the turbine building sump from either unit.

Both batch and continuous releases are monitored. Batch releases are sampled and analysed for tritium and gamma emitters before release. For continuous release paths, gamma analysis is performed on weekly grab samples and tritium analysis is performed on monthly grab samples. For both batch and continuous releases, alpha analysis is performed on monthly composite samples and beta analysis (for Sr-89, Sr-90, and Fe-55) is performed on quarterly composite samples, the latter by a vendor. Other than tritium, no significant alpha or beta emitters have been identified in liquid effluents.

During the first six months of 1985, about 327 curies of tritium and about 8.39E-3 curies of other nuclides were released in liquid effluents for both units combined. From this activity, the calculated maximum total body dose and maximum liver dose (most restrictive organ dose) to any individual beyond the site boundary was 1.64E-3 mrem and 2.07E-3 mrem, respectively.

The inspector reviewed the licensee's, "Investigative Report of Significant Operating Event," Report Number P-SOE-1-85-12, and interviewed selected involved personnel associated with failure to follow procedures involving liquid radwaste systems and liquid radwaste releases resulting in a premature liquid radwaste release from a tank to the river on August 15, 1985.

On August 9, 1985, following maintenance on No. 122 ADT Monitor Tank pump, a plant attendant (non-licensed operator) in the process of restoring valves to the normal status specified in Isolation and Restoration Log No. J4061-WL, erroneously set normally closed valve WL-16-68 (a recirculation cross-connect valve between ADT Monitor Tanks No. 121 and No. 122) to the open position. The procedure error is attributable primarily to the failure to follow the normal (but not procedurally required) practice of having in hand a copy of the isolation and restoration procedure which identified the normal valve status. The practice was believed unnecessary in this case by the plant attendant and his supervisor because of "familiarity with the system" and because of a telephone conversation by the plant attendant with his supervisor regarding the valves involved in the maintenance activity and their respective normal status. On August 15, 1985, a liquid release from No. 122 ADT Monitor Tank to the river was initiated and completed by another plant attendant without properly verifying that this same valve, valve WL-16-68, in the cross-connect line between No. 121 and No. 122 ADT Monitor Tanks was closed as required by release procedure C21.1.5.2 for No. 122 ADT Monitor Tank. This manually operated diaphragm type valve is the only valve in the release procedure to be verified as to position which is not easily accessible, being located about 15 feet above the floor, among other pipes, with the valve partially hidden from view, on top of the pipe. A valve stem indicating device is provided on the valve to visually show the valve stem position without having to obtain a ladder to physically check the valve position. The valve stem indicator was observed by the plant attendant and thought to be in its normally closed position and was erroneously verified as such. As a result of the referenced cross-connect valve being open during the

planned release of No. 122 ADT Monitor Tank and while No. 121 ADT Monitor Tank was in recirculation mode in preparation for subsequent release, about 2000 gallons was inadvertently released from the latter tank during the planned release from No. 122 ADT Monitor Tank. This was contrary to Step 1.a.6 of release procedures C21.1.5.1 and C21.1.5.2 for No. 121 and No. 122 ADT Monitor Tanks, respectively, which specify that only one liquid release is to be made at a time. Further, the inadvertent release from No. 121 ADT Monitor Tank was made without the prior signed approval of the shift supervisor required by Release Instruction PINGP-39. Failure to follow procedures for restoration of normal valve status following maintenance activities on liquid radwaste release systems and failure to follow liquid radwaste release procedures were identified by the inspector as a violation of Technical Specification 6.5.A which requires that detailed written procedures for plant operations be prepared and followed (violation 282/85019-01; 306/85018-01).

Only the concentration of tritium was above MPC in either tank (about 12 times MPC for the intended tank and about 8 times MPC for the other tank). The combined release rate was essentially the planned release rate for the tank intended for release. The dilution flow during the release provided a reduction factor of over 8000 resulting in the release at the river being less than one percent of MPC.

Corrective measures taken, or currently planned, by the licensee to preclude recurrence include: (1) current tagging of valve WL-16-68 with a requirement that approval be obtained prior to any movement of the valve position; (2) plans to replace the valve with a spool piece and blank flange since the valve is not normally used; (3) plans to require, by procedure, the current normal practice of having in hand a copy of the isolation and restoration procedure (which identifies the normal valve status) when making valving restorations following maintenance activities; (4) considering requiring physical verification of valve positions of diaphragm valves in plant systems rather than rely on valve stem position indicators; (5) circulation of the licensee's significant operating event report for required reading by operations personnel; and (6) plans to send a letter to all operating personnel emphasizing the importance of adhering to all procedural requirements.

One violation was identified.

4. Audits/Appraisals

The inspector reviewed an internal audit, Audit No. A-336, conducted by the Quality Assurance group between March 18, 1985, and June 7, 1985, to assess compliance with requirements of various administrative control directives, implementing procedures and work instructions involving the radiation protection and chemistry group. The scope included control and implementation of procedures, qualifications of personnel, instrument calibrations, effluent surveillance and records. The audit, conducted by qualified personnel, identified no significant problems in the liquid and gaseous effluent programs.

5. Testing of Air Cleaning Systems

The most recent in-place filter tests and laboratory methyl iodide tests on plant ventilation systems were performed in November of 1984 for the control room special ventilation, the auxiliary building special ventilation, and the spent fuel pool special ventilation system. The most recent tests were performed in February of 1985 for the Unit 1 shield building vent and September of 1985 for the Unit 2 shield building vent. The in-place testing included DOP testing of HEPA filters and freon testing of charcoal adsorbers. All in-place tests indicated greater than 99 percent removal which meets the technical specification requirements. Laboratory testing of the charcoal adsorbers, using methyl iodide, is being performed by a vendor. Laboratory methyl iodide test results of the most recent tests on all systems were available except for the Unit 2 shield building vent samples collected on September 7, 1985, a few days before this inspection. All available test data indicated significantly greater than 90 percent methyl iodide removal which meets the technical specification requirements.

The inspector observed that the laboratory analysis of some samples have not been performed by the vendor until a period of several months after the samples were collected. However, the technical specification required 18 months testing frequency was met in that samples are being collected at a frequency of twelve months or less. The inspector noted that while the licensee's technical specifications do not designate a time limit, the technical specifications for some newer plants require the analysis to be completed within 30 days of sample collection. The licensee stated that part of the delay in analysis of charcoal adsorber samples was due to the licensee's tardiness in sending samples to the vendor due to some of the samples being misplaced for a period of time during their 10 year ISI outage. Licensee personnel stated they would evaluate measures to minimize the time between sample collection and sample analysis.

6. Radiological Environmental Monitoring Program (REMP)

The inspector reviewed the REMP results presented in the 1983 and 1984 Annual Reports to assure compliance with monitoring and reporting requirements in accordance with Section 4.10 and 6.7.C.1 of Appendix A Technical Specifications, respectively. Data anomalies in the report were adequately explained. All samples were properly collected at the specified locations except for green leafy vegetation which changed from the Larson farm to the Suter farm because of unavailability of the vegetation at the Larson farm. This was identified as a deficiency in an internal audit (Audit No. AG-85-51-15) conducted by the licensee's Nuclear Operations QA Department on July 16-17 and August 12 and 19, 1985. This licensee will issue errata to the annual report and the ODCM with the corrected information on vegetation.

Other minor discrepancies in the REMP were also identified during the above mentioned audit which will be corrected and closed out by December 15, 1985 during a followup audit.

No violations or deviations were identified.

7. Exit Interview

The inspector summarized the scope and findings of the inspection with licensee representatives (Section 1) at the conclusion of the inspection on August 29, 1985. The inspector discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify such documents or processes as proprietary.

Licensee representatives acknowledged the inspector's identification of a violation involving failure to follow procedures regarding restoration of a radwaste system following maintenance activities and regarding a subsequent unplanned liquid radwaste release from the system. The violation was reaffirmed in subsequent telephone conversation with Mr. D. Schuelke on September 26, 1985.

An additional discussion on the radiological environmental monitoring program (REMP) was held by telephone with a licensee representative on October 1, 1985, who indicated that discrepancies in the REMP would be corrected by December 15, 1985.