U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-282/92003(DRSS); 50-306/92003(DRSS)

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

Inspection At: Prairie Island Site, Redwing, Minnesota

Inspection Conducted: February 25-28, 1992

Inspector: T. J. Kozak — Date: 3/5/92

Approved By: William Snell, Chief, Radiological Controls Section — Date: 3/6/92

Inspection Summary

Inspection on February 25-28, 1992 (Report Nos. 50-282/92003(DRSS); 50-306/92003(DRSS))

Areas Inspected: Routine unannounced inspection of the radiation protection program during a Unit 2 refueling outage, including: organization, management controls and training; external exposure control; internal exposure control; control of radioactive materials, contamination, and surveys; and maintaining occupational exposures ALARA (IP 83750).

Results: The licensee's radiation protection program appears to be very effective and capable of protecting the health and safety of the workers and the public. No violations or deviations were identified. Strengths identified included a strong program for control of contamination and radiation and the continued effectiveness of the ALARA program. No weaknesses were identified.

DETAILS

1. Persons Contacted

S. Derleth, Radiation Protection Specialist
*A. Hunstad, Staff Engineer
*A. Johnson, Radiation Protection Supervisor
*M. Ladd, Training Supervisor
D. Larimer, Radiochemistry Supervisor
*D. Schuelke, General Superintendent, Radiation Protection
*M. Sellman, Plant Manager
D. Stember, Radwaste Engineer
P. Wildenborg, Health Physicist

*D. Kosloff, NRC, Resident Inspector

The inspector also interviewed other licensee and contractor personnel during the course of the inspection.

* Denotes those present at the exit meeting on February 28, 1992.

2. General

This inspection was conducted to review aspects of the licensee's radiation protection program. The inspection included tours of radiologically controlled areas including the auxiliary building, Unit 2 containment, and radwaste facilities, observations of work in progress, reviews of representative records and discussions with licensee personnel. During performance of the tours, no significant access control, posting, or procedural adherence problems were noted. Housekeeping was adequate considering the stage of the outage at the time of the inspection.

3. Organization, Management Controls and Training (IP 93750)

The inspector reviewed changes in the licensee's organization, management controls, personnel facilities and equipment, and training programs that could affect the occupational radiation protection program.

The Radiation Protection Group remained stable as there was no turnover since the last radiation protection inspection. The radiation protection technician (RPT) staff was augmented by the addition of about 30 contract technicians (CRPT) for the Unit 2 refueling outage. The licensee recently initiated the use of a challenging radiation protection theory exam as part of their CRPT training program. A thorough study guide for the exam was provided to all CRPTs a few weeks prior to their arrival on site. The study guide and exam was developed and used by several Region 1 plants to test CRPT knowledge of radiation protection objectives. The licensee did not require a passing score on the exam as a condition for employment. Rather, it was used to indicate areas where additional instruction was needed. Successful completion of a two day site procedure course and exam was the next step in the CRPT training program. A qualification journal requiring supervisor verification that all outage radiological control functions were adequately performed was then required to be completed

prior to CRPT assignment to shift work for the outage. Interviews with several CRPTs indicated that they found the training process to be challenging. The augmented staff appeared to be well qualified to implement the requirements of the radiological control program.

No violations or deviations were identified.

4. External Exposure Control (IP 83750)

The inspector reviewed the licensee's external exposure control and personal dosimetry program, including: changes in the program, use of dosimetry to determine whether requirements were met, planning and preparation for maintenance and refueling outage tasks including ALARA considerations and required records, reports and notifications.

The licensee's external exposure control program remained essentially the same as previously reported. Personnel were provided a TLD and a low range self reading pocket dosimeter (SRD) for routine entries into radiation areas. For entry into high radiation areas, a high range SRD was also required. Electronic SRDs were used in lieu of pocket dosimeters for certain high dose jobs such as steam generator eddy current inspections and in-service-inspection work. The licensee planned to adopt the use of electronic dosimetry for all entries into radiologically controlled areas some time after completion of the refueling outage. The inspector observed several jobs in progress and verified that the proper dosimetry was in place. The licensee issued multiple dosimetry for steam generator eddy current work which appeared to ensure the highest dose to the whole body would be recorded. Although electronic dosimetry was used for this work and alarms were set to activate at a certain dose rate or an accumulated dose, the licensee did not rely on these indications for control. Rather, workers were controlled in these areas by RPT surveillance and stay times. No problems were noted.

The licensee used administrative dose limits in an effort to ensure no personnel exceeded NRC dose limits. The licensee's whole body dose limit was 1 Rem per quarter. If an NRC Form 4 was completed for an individual, the allowed whole body dose was 2.25 Rem per quarter. A lifetime dose limit of 2(N - 17) Rems, where N is the workers age in years, was also used. If the lifetime dose exceeded this value, the worker was only allowed 2 Rem per year. Declared pregnant women were limited to 50 millirem per quarter. The inspector reviewed the licensee's exposure reports for 1991; no exposures greater than the licensee's administrative limits or 10 CFR 20.101 requirements were noted. No problems were noted.

No violations or deviations were identified.

5. Internal Exposure Control (IP 83750)

The inspector reviewed the licensee's internal exposure control and assessment programs, including: changes to facilities, equipment, and procedures affecting internal exposure control and personal exposure assessment; determination whether respiratory equipment, and assessment of individual intakes met regulatory requirements; required records, reports, and notifications; effectiveness of management techniques used

to implement these programs; and experience concerning self-identification and correction of program implementation weaknesses.

There were no major changes to the licensee's procedures affecting internal exposure control since the last inspection. The licensee uses engineering controls, surface and airborne radioactivity survey data, and respiratory protection to implement their internal exposure control program. The licensee has generally attempted to reduce the use of respirators by using additional engineering controls during this outage. The use of portable vacuum cleaners to provide suction in work areas allowed elimination of respirator use during the reactor head ventilation modification and during contaminated socket weld cutting evolutions. No problems were noted.

The licensee recently replaced its lay down whole body scanner with a fast scan whole body counter. The sensitivity for cobalt-60 was slightly improved over the old method and the counter's software allowed for background corrected data to be obtained much quicker than before. A review of whole body count records and discussions with licensee personnel indicated that no individual has been exposed to airborne radioactivity greater than the 40 MPC-hour investigation level requirement since the last radiation protection inspection.

No violations or deviations were identified.

6. Control of Radioactive Material and Contamination, Surveys, and Monitoring (IP 83750)

The inspector reviewed the licensee's program for control of radioactive materials and contamination, including: adequacy of supply, maintenance and calibration of contamination survey and monitoring equipment; effectiveness of survey methods, practices, equipment and procedures; adequacy of review and dissemination of survey data; effectiveness of radioactive and contaminated material controls.

The licensee's personnel monitoring devices remained essentially the same as last reported. Calibrations for survey instruments and personnel monitoring devices were randomly checked with no problems noted. The inspector reviewed posting requirements to determine if they were effective in preventing unauthorized entry into contaminated or high radiation areas. Radiation levels were routinely posted at the entrance to high radiation areas and the inspector did not find any problems with the area postings or indications of inadvertent entry into these areas. Official surveys were readily available at the controlled area access point and those reviewed had received appropriate supervisory approvals.

The licensee conservatively posts areas as contaminated at a detectable contamination level of 100 disintegrations per minute (dpm). The licensee's policy was to decontaminate newly found contaminated areas as soon as possible. Only those areas that were not practical to decon because of dose considerations or repetitive maintenance requirements were not deconned. Yellow metal barriers were normally located at the boundaries to the permanently posted contamination areas. The barriers provided for easy identification of the areas and were effective in

preventing the spread of contamination outside of the areas. The number of personnel contamination events during 1991 was low at 85.

As part of the review of the contamination and radiation control program, the inspector accompanied a nuclear plant attendant on his normal shiftly round in the auxiliary building to determine how normal work requirements were affected by the radiological conditions in the building. The licensee's conservative posting policy led to the operator needing to enter several areas that were posted as contaminated. Since none of these areas were contaminated to levels greater than 1,000 dpm, anti-contamination clothing requirements for entering these areas were limited to cloth shoe covers and surgeons gloves. It did not appear that these clothing requirements were much of a burden to the attendant. The attendant had to access only a few high radiation areas due to efforts by the licensee to minimize the size of these areas. Housekeeping in the auxiliary building was excellent. There was no buildup of debris in any of the contaminated areas and postings in the areas were clear and appeared to meet requirements. The condition of the building coupled with the low number of PCEs indicated that the licensee's policy for control of radiation and contamination was very effective.

No violations or deviations were identified.

7. Maintaining Occupational Exposures ALARA (IP 83750)

The inspector reviewed the licensee's program for maintaining occupational exposures ALARA, including: ALARA group staffing and qualification; changes in ALARA policy and procedures, and their implementation; ALARA considerations for planned, maintenance and refueling outages; worker awareness and involvement in the ALARA program; establishment of goals and objectives, and effectiveness in meeting them.

There has not been any change in the licensee's ALARA program since the last inspection. The staff remained efficient in incorporating ALARA controls into work evolutions and communications between departments remained an essential asset to the successful implementation of the program. The total station dose for 1991, during which there was one refueling outage, was low at 98.315 person-rem.

The licensee added hydrogen peroxide to the reactor coolant while the reactor was in hot shutdown and obtained a significant crud burst as a result. Operating procedures had been modified to prevent recurrent problems with this evolution which had been previously reported. Another crud burst was experienced when refueling concentrations of boron was added while the reactor was at cold shutdown conditions. The purification system was effective in removing the added activity from solution.

The licensee performed several ALARA reviews for the 1992 Unit 2 refueling outage that were verified by the inspector to be thorough and effective up to the time of the inspection. Worker training and dose saving work techniques were especially effective for the steam generator nozzle dam installations as this work was done quickly and efficiently and the dose received was very low at about 2 person-rem.

The licensee was very effective in maintaining reactor coolant lithium levels steady at about 2.2 ppm during the past Unit 2 operating cycle and it appeared that steam generator channel head dose rates had not increased during the cycle. The licensee was in the initial stages of developing a reactor system cobalt reduction program at the time of the inspection. This program will include identification of equipment in the reactor coolant system containing cobalt, purchasing department input to ensure cobalt free replacement parts will be obtained and kept in stock, and engineering involvement during the modification process. No problems were noted.

No violations or deviations were identified.

8. Exit Interview

The inspector met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on February 28, 1992, to discuss the scope and findings of the inspection.

During the exit interview, the inspectors discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. Licensee representatives did not identify any such documents or processes as proprietary. The following items were specifically discussed:

a. The effectiveness of the radiation and contamination control program.

b. The continued effectiveness of the ALARA program.