

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-306/84-12(DRSS)

Docket No. 50-306

License No. DPR-60

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

Facility Name: Prairie Island Nuclear Generating Plant, Unit-2

Inspection At: Prairie Island Site, Red Wing, MN

Inspection Conducted: September 10-14, 1984

Inspectors: *D. E. Miller/for*  
W. B. Grant

10/4/84  
Date

*D. E. Miller/for*  
N. A. Nicholson

10/4/84  
Date

Approved By: *D. E. Miller*  
D. E. Miller, Chief  
Facilities Radiation  
Protection Section

10/4/84  
Date

Inspection Summary

Inspection on September 10-14, 1984 (Report No. 50-306/84-12(DRSS))

Areas Inspected: Routine, unannounced inspection of the radiation protection program during Unit-2 refueling activities, including: internal and external exposure control; contamination control; training; the ALARA program; audits; posting and labeling; selected open items; and Engineered Safety Feature (ESF) filter drain lines. The inspection involved 86 inspector-hours on site by two NRC inspectors.

Results: No violations or deviations were identified.

## DETAILS

### 1. Persons Contacted

- T. Asmus, Production Engineer
- T. Gatten, Chemistry Coordinator
- M. Gruber, Production Engineer
- \*A. Hunstad, Staff Engineer
- A. Johnson, Radiation Protection Supervisor
- \*D. Mendele, Plant Superintendent, Engineering and Radiation Protection
- J. Oelkers, Quality Control Specialist
- J. Patton, Radiation Protection Specialist
- \*D. Schuelke, Superintendent, Radiation Protection
- \*E. Watzl, Plant Manager
  
- \*R. Greger, NRC/RIII
- \*J. Hard, NRC Senior Resident Inspector

The inspectors also contacted other licensee employees including technicians and technical and engineering staff members.

\*Denotes those present at the exit meeting.

### 2. General

This inspection, which began at 11:30 a.m. on September 10, 1984, was conducted to examine the radiation protection program during the Unit-2 outage, open items, and training. During facility tours, the inspectors noted access to radiation areas was well-controlled and posting and labelling were conspicuous. Housekeeping remains excellent.

### 3. Licensee Action on Previous Findings

(CLOSED) Open Item (282/84-01-01; 306/84-01-01) Relative increase of Sb-124 concentrations in Aerated Drain Tank (ADT) and Chemical Volume Control System (CVCS) grab samples. A sequence of resin beds is now utilized that reduces Sb-124 concentrations. Sample results for August and September 1984 were reviewed; no problems were now noted.

### 4. Audits and Appraisals

The inspectors reviewed reports of audits and appraisals conducted for or by the licensee including audits required by technical specifications. Also reviewed were management techniques used to implement the audit program, and experience concerning identification and correction of programmatic weaknesses.

One audit (AG-84-29-15) of radiation protection and laboratories was conducted by the NSP staff since the previous radiation protection inspection conducted in January 1984. The audit had no findings but made several recommendations concerning various procedural matters. The recommendations are being reviewed by the licensee.

No violations were identified.

5. Changes

The inspectors reviewed changes in organization, personnel, facilities, equipment, programs, and procedures that could affect the outage radiation protection program.

J. Sorenson, a health physics production engineer, transferred to the Prairie Island Training Section in May 1984. John Friedrich, a recent BS graduate, was hired as a health physics production engineer and has reported for duty. There are no specific ANSI N18.1-1971 requirements for this position. Other changes noted are discussed in Sections 6 and 8.

6. Training and Qualifications of New Personnel

The inspectors reviewed the education and experience qualifications of new plant and contractor radiation protection and chemistry personnel, and training provided to them. Also reviewed was radiation protection training provided to other contractor personnel.

For the Unit-2 outage, the licensee has augmented the radiation protection staff with 24 contract technicians. A special training program was provided the contract technicians consisting of about 12 hours of Prairie Island radiation protection policies and procedures training, in addition to General Employee Training (GET). The contract technicians also passed all plant radiation protection specialist (RPS) qualification card requirements, such as: contamination control, radiation survey, respiratory protection, access control, and radiation work permits (RWP) procedures.

The inspectors reviewed the contract technicians' technical training records and resumes; no problems were identified.

No violations were identified.

7. Planning, Preparation and ALARA

The inspectors reviewed the licensee's program for maintaining occupational exposures ALARA, including: ALARA considerations for maintenance and refueling outage; worker involvement in the ALARA program; establishment of goals and objectives, and effectiveness in meeting them. The inspectors also reviewed the outage planning and preparation completed by the licensee including additional staffing, special training, increased equipment and supplies, and job related health physics considerations. Increases in staffing and training are discussed in Section 6.

The licensee held three pre-outage meetings to identify high dose jobs and plan maintenance activities to reduce personal exposure. The following ALARA measures were implemented during this outage.

- . Steam generator mockups used for training and testing.
- . Use of automated eddy current testing equipment which is operated remotely without routine personnel entry into the steam generators. The radiation protection supervisor documented a 4 person-rem savings over conventional eddy current testing used on this unit during the previous outage for the same number of tubes.
- . Use of a reactor head shield on a scissors jack. Lead blankets hung from this shield during O ring replacement reduces working area background fields.
- . Cleaning reactor head studs in a lower background area. The reactor head remained in place as opposed to previous outages where the head was removed and stored in the same general area as cleaning operations.
- . Modification of reactor cavity drain sumps to minimize crud buildup on a fixed filter.

The above actions indicated good ALARA planning and will be further evaluated during a future inspection. Good management and worker support for this program was indicated. No problems were noted.

No violations were identified.

#### 8. External Exposure Control

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

The inspectors reviewed whole body TLD results for CY 1984. Exposures remain low; no regulatory limits were exceeded. NRC Form-4's reviewed for selected individuals with exposures greater than 1.25 rem/quarter, were completed in accordance with 10 CFR 20.102; most individuals received a portion of these doses at other nuclear facilities. A member of the radiation protection staff reviews daily exposure updates listing doses and permissible remaining exposure to assure limits are not exceeded.

The inspectors verified workers exposed to non-uniform radiation fields wear multiple site whole body dosimetry, as indicated by I&E Information Notice 83-59. The highest site reading is recorded as the legal dose. During controlled area tours, the inspectors observed individuals routinely wearing dosimetry on the upper half of the body, at mid-chest level.

TLD and pocket dosimeter results are compared in accordance with RPIP 1116 TLD/Dosimeter Comparison. Comparison results reviewed for June and July 1984 were satisfactory; no problems were noted. Pocket dosimeter readings

are used when the TLD badge is lost. Licensee representatives are tracking reports of individuals who frequently lose badges in an effort to minimize these occurrences.

No violations were noted.

9. Internal Exposure Controls

The inspectors reviewed the licensee's internal exposure control and assessment programs, including: changes to procedures affecting internal exposure controls and personal exposure assessment; determination whether engineering controls, respiratory equipment, and assessment of individual intakes meet regulatory requirements; planning and preparation for maintenance and refueling tasks including ALARA considerations; and required records, reports, and notifications.

Review of whole body count data showed no indication of exposures approaching the 40 MPC-hour control measure. Whole body count data was reviewed for about 165 counts conducted between February 1 and August 31, 1984 on company and contractor personnel. Several followup counts were performed on persons who showed elevated initial counts. Followup counting was adequate to verify that the 40 MPC-hour control measure was not exceeded.

The inspectors reviewed RPIP 1205 "MPC-Hours Determination" for technical content and regulatory compliance; MPC-hours are determined in accordance with 10 CFR 20.103. No airborne exposures resulting in assigned MPC-hours have occurred this calendar year. No problems were noted.

No violations were identified.

10. Control of Radioactive Materials and Contamination

The inspectors 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; and effectiveness of methods of control of radioactive and contaminated materials.

The licensee has obtained a new generation portal monitor (Frisk all) with increased sensitivity; it is located at access control. Specific RWP's for work in high contaminated areas and/or on contaminated systems, require personnel to use this portal when exiting the controlled area. Radiation Occurrence Reports (ROR's) for 1983 and 1984 indicate an increase of detected personnel contaminations; personnel and/or clothing were appropriately decontaminated. The inspector also reviewed routine area survey results. No problems were noted.

During controlled area tours, the inspectors noted friskers were operable and generally located in low background areas. Posting and labelling were conspicuous. During the September 14, 1984 containment tour, the inspec-

tors noted the following non-uniform use of standardized, color-coded markings: yellow vinyl used for both radioactive and non-radioactive material control; and red tape demarcating a step-off pad area. These examples, and the possible confusion caused, were discussed at the exit meeting.

No violations were identified.

#### 11. Radiation Protection Procedures

The inspectors selectively reviewed the following new or recently revised radiation protection procedures to determine if they are compatible with regulatory requirements and good health physics practices. No significant problems were identified.

RPIP 1115, Revision 0	Monthly TLD Changes
RPIP 1116, Revision 0	TLD/Dosimeter Dose Comparison
RPIP 1120, Revision 0	Posting of Controlled Areas
RPIP 1121, Revision 0	RWP Issue
RPIP 1125, Revision 0	Radiation Occurrences
RPIP 1126, Revision 0	Personnel Decontamination
RPIP 1129, Revision 0,	Personal Clothing Replacement
RPIP 1130, Revision 0,	Timekeepers Procedures
RPIP 1200, Revision 0,	Control and Tagging of Radiation Materials
RPIP 1205, Revision 0,	MPC-Hour Determination
RPIP 1304, Revision 0,	Conditional Release of Equipment to Clean Area
RPIP 1306, Revision 0,	Drumming of Wet Trash
RPIP 1531, Revision 0,	J. C. Shepherd Source Calibration Operation
RPIP 1602, Revision 0,	Daily Surveys
RPIP 1603, Revision 0,	Weekly Surveys
RPIP 1605, Revision 0,	Daily and Weekly CAM Checks
RPIP 1606, Revision 0,	Updating RWPs and Status Boards
RPIP 1627, Revision 0,	Dosimeter Calibration
RPIP 1704, Revision 0,	Radiation Protection During Eddy Current Testing
RPIP 1705, Revision 0,	Reactor Head Removal

#### 12. Nuclear Diving Activities

The licensee is currently preparing a formal nuclear diving procedure based on I&E Information Notice 82-31 and Radiation Protection Manual instructions, G.15 "Diving Operations". Maintenance activities on the fuel transfer motors, involving a dive into the fuel transfer canal just before this outage, were conducted in accordance with the above instructions. Radiation protection measures included vacuuming debris from the dive area before entry, an underwater survey, briefing the diver concerning radiation fields, and multiple dosimetry badging. The diver's whole body exposure was 18 mrem; extremity exposure was 30 mrem. The inspectors reviewed the survey and proposed procedure. No problems were noted.

No violations were identified.

13. NUREG-0737, Item II.F.1.2. - High Range Iodine and Particulate Effluent Sampling and Analysis

The sampling equipment is installed and operational, procedures have been written and implemented, and training has been developed and provided to persons who would be required to collect and analyze the samples.

The licensee has documentation intended to show compliance with General Design Criteria 19 required by Clarification Item 2 of Task Item No. II.F.1.2. using the NUREG-0737 design bases shielding source term of 100  $\mu\text{Ci/cc}$  of gaseous radioiodine and particulate deposited on sampling media for 30 minutes with an average energy of 0.5 Mev. However, the licensee has not determined the sampling line loss correction factors due to iodine plate out and particulate deposition during normal and accident conditions. The inspectors requested that the licensee investigate possible line losses under both conditions. This matter was discussed at the exit meeting and will be reviewed during a future inspection (306/84-12-01).

14. Filter Housing Drain Systems

The status of the HVAC filter housing drains was reviewed. Two of the three Engineered Safety Features (ESF) HVAC systems have automatic deluge systems. The shield building and the auxiliary building special ventilation systems have automatic deluge systems installed. The control room special ventilation system, which is also considered an ESF system, does not have a cooling mechanism for possible adsorbent (charcoal) ignition from radiation induced heat as suggested by Regulatory Guide 1.52 Section 3.K. This was discussed at the exit meeting and will be reviewed during a future inspection (306/84-12-02).

All the HVAC filter housings including the ESF systems have individual floor drain lines for each chamber of the housing. The drain lines are sealed with pipe plugs. According to the licensee there are no written procedures for draining the filter housings to prevent water backup in the event the deluge system is activated, as suggested in ERDA 76-21, which is referenced in Regulatory Guide 1.52. This matter was discussed at the exit meeting and will be reviewed during a future inspection (306/84-12-03).

15. Exit Meeting

The inspectors met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on September 14, 1984. The inspectors summarized the scope and findings of the inspection. In response to certain issues discussed, the licensee agreed to investigate:

- a. Possible sample line loss under normal and accident conditions (Section 14).
- b. Methods of preventing water backup in filter housings when the deluge system is activated (Section 15).