U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-263/84-14(DRSS)

Docket No. 50-263 License No. DRP-22

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

Facility Name: Monticello Nuclear Generating Station

Inspection At: Monticello Site, Monticello, MN

Inspection Conducted: June 25-29, 1984

Inspectors: W. B. Grant — Date: 7/26/84

N. A. Nicholson — Date: 7/26/84

Approved By: L. R. Greger, Chief
Facilities Radiation Protection Section — Date: 7/26/84

Inspection Summary

Inspection on June 25-29, 1984 (Report No. 50-263/84-14[DRSS])
Areas Inspected: Routine, unannounced inspection of radiation protection activities during a major outage. Activities reviewed included audits and appraisals, changes, planning and preparation, training and qualification of new personnel, external exposure control, internal exposure control, control of radioactive materials and contamination, and ALARA. Also reviewed were the status of certain NUREG-0737 task items, IE Information Notices, and licensee actions involving a radioactive waste shipment which contained liquid. The inspection involved 70 inspector-hours onsite by two NRC inspectors.
Results: Of the eleven areas inspected, no violations or deviations were identified in ten areas; one violation was identified in the remaining area (solid radwaste containing free standing liquid - Section 13).

DETAILS

1. Persons Contacted

B. Carlson, I&C Specialist
*F. Fey, General Superintendent, Radiation Protection and Chemistry
R. Jacobson, Senior Plant Chemist
M. Miller, Plant Health Physicist
G. Mathieson, Supervisor, Rad Services
*D. Nevinski, Plant Superintendent, Engineering and Radiation Protection
D. Orrock, Radiation Protection Specialist
J. Peterson, Radiochemistry Supervisor
*W. Shamla, Plant Manager
*L. Waldinger, Superintendent, Radiation Protection
P. Walker, Senior Quality Engineer
*J. Windschill, Plant Health Physicist
P. Yurczyk, Radiation Protection Supervisor

C. Scholl, Proto Power (Consultant)

C. Brown, Senior Resident Inspector, NRC

*Attended the exit meeting.

2. General

This inspection, which began at 10:30 a.m. on June 25, 1984, was conducted to examine routine aspects of the radiation protection program during a refueling and major maintenance outage. During plant tours, the inspectors used an NRC survey meter (Xetex 305-B) to monitor selected areas throughout the plant. Measurements were in good agreement with posted survey data; area postings and housekeeping were good.

3. Audits and Appraisals

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

One quality assurance audit of radiation protection/chemistry activities was performed by a corporate quality auditor since the previous radiation protection inspection in February 1984. The auditor does not have a professional health physics background but does have nuclear Navy training and experience. Audit AG-84-23-15, conducted June 1984, had no findings but did have two recommendations; one concerned the 12-month medical certification by a physician of workers' fitness to wear respiratory protection, and the other concerned alpha air sample counting techniques. These recommendations are being considered by the licensee.

No violations were identified.

4. Changes

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

The radiation protection coordinator and the chemistry coordinator have been promoted to Radiation Protection Supervisor and Radiochemistry Supervisor, respectively. Other changes noted are discussed below in Sections 5, 6, and 9.

5. Planning and Preparation

The inspectors reviewed the outage planning and preparation performed by the licensee, including: additional staffing, special training, increased equipment, supplies, and job related health physics considerations.

Increases in staffing and training are discussed in Section 6. The following matters are examples of planning and preparation performed by the licensee for the current outage:

- Turbine building addition constructed to ease condenser hot well tube removal, and to help limit contamination spread.
- Computer generated whole body/extremity dose factor is being used to track extremity doses.
- Specialized training, mockups, and shielding are used for the recirculation piping replacement project.
- Major chemical decontamination work has been performed. This work is described further in Sections 9 and 10.

No violations were identified.

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 the training provided them. Also reviewed was radiation protection training provided other contractor personnel.

Early in the outage, rad protection personnel noted an increase in violations of radiation protection procedures, i.e., failure to sign RWP acknowledge sheet, failure to log out and record dose, failure to frisk, and other violations of procedures which are included in the General Employee Training (GET). A trending study of the violations showed that the number of violations had increased from a norm of 10-20 per week to over 200 per week. Ten training sessions were held from May 9 through May 11, 1984, for approximately 400 NSP and contractor personnel. These sessions were tailored to emphasize the procedures which were apparently not being followed. The licensee is continuing to trend violations and they have dropped to a normal level of about 10-20 per week. No other problems were identified.

Throughout the outage the plant's radiation protection staff has been augmented with a maximum of 36 contract technicians. As previously discussed in Inspection Report No. 50-262/84-02, the contract radiation protection specialists (CRPS) are given training and must pass a written exam with an overall score of 80% to become qualified. The inspectors reviewed CRPS training records and exam results; no problems were noted. The contract technicians who arrived after the radiation protection inspection of February 1984 also either meet or exceed the qualifications required by Technical Specification 6.1.0, which references ANSI N18.1-1971, "Selection and Training of Nuclear Power Plant Personnel", or they are used in jobs where they can be closely supervised. Two of the contract technicians have been selected to replace two plant radiation protection specialists who have left the company. No problems were noted.

No violations were identified.

7. External Exposure Control

The inspectors reviewed the licensee's external exposure control and personal dosimetry programs, including: changes in the program 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.

Exposure records for the first quarter of 1984 were reviewed; no exposures in excess of the regulatory limits were identified. The inspectors verified that selected NRC Form 4's were complete in accordance with 10 CFR 20.101(b)(3) for personnel exceeding 1.25 rem per quarter. NRC Form-5's were appropriately maintained.

Licensee representatives have reduced the total estimate for the outage from 1920 to 1468 person-rems. As of June 25, 1984, the accumulated total dose for the outage was 1258 person-rems. These savings were attributed to a more effective recirculation piping decontamination effort than anticipated.

As discussed in a previous report, a contracted vendor provides an onsite TLD reader and technician for more immediate TLD readouts during the outage.[1] A current quarterly total is available, updated daily, on a computer tracking system. Discrepancies between the onsite computer updates and hard copy exposure reports generated by the vendor's home office were noted by the inspector and licensee. The licensee has submitted corrected entries to rectify these discrepancies.

To track doses more closely, a list of individuals reaching 80% of their exposure limit is printed daily and is distributed to the Radiation Protection Supervisor (RPS) and local HP desks thoughout the plant. Memos delineating access restrictions for those on the alert list are fowarded to the individual, his supervisor, and the exposure control health physicist.

[1]Report No. 50-263/84-02

The licensee conducts a TLD spiking program in accordance with Procedure R.9.23 as a quality assurance check on vendor results. No problems were noted. TLD and self-reading dosimeter (SRD) results are summed and ratioed on a monthly basis; these comparisons are tracked. This program identified an upscale drifting of the onsite TLD reader, resulting in approximately 10% greater TLD readings. After adjustment, ratios approached a one-to-one correspondence as reported in prior months. The licensee continues to monitor these comparisons.

No apparent violations were identified.

8. Internal Exposure Control

The inspectors reviewed the licensee's internal exposure control and assessment programs, including: changes to procedures affecting internal exposure control 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; required records, reports, and notifications.

Review of selected airborne surveys and whole body count data showed no indication of exposures approaching the 40 MPC-hour control measure. Data was reviewed for about 1000 whole body counts conducted between January 1 and June 26, 1984, for 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 the licensee's MPC-hour determination, medical authorizations, respiratory training records, and mask protection factors for respirator users.

Calculational methods of Procedure R.4.2, "MPC-Hour Tracking," were reviewed; no problems were noted. Annual medical tests are conducted by the company nurse under a physician's direction; this meets the requirements of 10 CFR 20.103(c)(2). Medical authorizations for contractor and NSP personnel were reviewed; annual frequencies and appropriate medical tests were verified. Protection factors, determined by mask fit testing, are in accordance with 10 CFR 20, Appendix A. Selected records documenting protection factors and respiratory training were reviewed for contractors and NSP personnel; no problems were noted.

No apparent violations were identified.

9. 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.

Records of routine and job specific surface contamination surveys conducted for February 1984 to date were selectively reviewed. Routine surveys appear to be performed at the frequencies specified. Job specific surveys appear adequate to assess the need for assurance of RWPs and to specify protective requirements when RWPs are issued. No problems were noted.

The licensee controls access to the controlled area by a radiation work permit (RWP) program. The inspectors reviewed selected active RWPs which appeared to be prepared in accordance with Procedure R.1.1. RWPs reviewed were complete and protective actions appeared appropriate and specific. Each RWP is reviewed by the ALARA coordinator. During plant tours, the inspectors noted a copy of the RWP is posted at or near the work site for reference.

A logistics problem occurred in the drywell after the recirculation piping decontamination had been completed and various contractors began their assigned work. The CRPS in the drywell saw that more workers were attempting to do work in the drywell than they could safely control. A Radiation Safety Deficiency Report (RSDR-84-28) was issued and all drywell work was stopped until corrective action could be taken. Corrective action included appointing a Drywell Coordinator whose responsibilities included coordination of all drywell work and setting priorities for all critical and non-crital path work projects.

An entry card system was devised whereby craftsmen were not allowed into the drywell unless they presented an entry card at the control point. According to the licensee the drywell work has been proceeding smoothly since that time. The inspectors did not observe any congestion in the drywell. No other problems were noted.

The inspectors made several tours of radiologically controlled areas. Posting and labeling appeared to be in agreement with survey data. The inspectors noted increased emphasis on adequate and proper frisking by persons leaving radiologically controlled areas. The inspectors observed that additional shielded booths are being installed and equipped with friskers. The licensee has recently installed two new, more sensitive, portal monitors at access control. According to the licensee, the monitors, IRT Model 1CM-110, have about four times the sensitivity of the old portal monitors and can detect 50-75 uCi of cobalt-60 and 100-150 uCi of cesium-137.

After the chemical decontamination, the recirculation piping was found to be internally contaminated with removable beta/gamma and alpha contamination. Therefore, each section of pipe was carefully bagged as it was removed from the recirculation system, thereby preventing the spread of contamination.

No violations were identified.

10. Maintaining Occupational Exposures ALARA

The inspectors reviewed the licensee's program for monitoring 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.

Several new or otherwise significant ALARA related matters were noted by the inspectors, including:

- Chemical decontamination of the recirculation system piping was completed before major work was performed.
- RHR piping, three RHR pumps, and recirculation system isolation valves were removed to reduce radiation and to add work space before major work was performed.
- Crud traps under the thermal sleeve of the inlet nozzle were hydrolyzed to reduce radiation levels.
- Completion of an ALARA review form and an ALARA pre-planning checklist before the job begins. The object is to assure that all preparations are completed before entering a radiologically significant area to start the job.
- Use of Xetex "Teledose" monitoring system to transmit workers' real time dose to the control point as they are working in high radiation areas.

The licensee estimates that significant dose will be saved during this outage, resulting mainly from decontamination of the circulating system piping before the major outage work but also from increased emphasis being placed on ALARA review of all radiation work permits before their implementation.

No violations were identified.

11. Status of Certain NUREG-0737 Task Items

a. Containment High Range Radiation Monitor (Task II F.1.3)

The deviations requested by NSP on transmitter and recorder qualifications, the use of existing separation scheme, the use of existing instrument AC power system, and an exception on installed monitors' calibrator were found to be acceptable by NRR (letter dated 6/3/82). The NRR review concluded that the containment high range monitors were capable of operating under accident conditions. In accordance with an NRR commitment, the licensee calibrated these monitors in March 1984 in accordance with NUREG-0737, Table II.F.1.3. No problems were identified.

b. High Range Iodine and Particulate Effluent Sampling and Analysis (Task II F.1.2)

The General Atomic sampling equipment is installed and operational; procedures have been written and implemented; and training has been 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 II.F.1.2. However, the inspectors found an apparent discrepancy between the estimated dose to retrieve the reactor building vent sample and the area shielding study performed by General Electric. This will be reviewed during a future inspection. (263/84-14-01)

The licensee had no documentation to show correction factors for line losses or deposition when sampling postaccident releases of radioactive iodines and particulates to meet the requirements of NUREG-0737, Table II F.1-2. The inspectors requested that the licensee investigate possible line losses for postaccident conditions. This was discussed at the exit meeting and will be reviewed during a future inspection. (263/84-14-02)

12. I&E Information Notices

The inspectors reviewed licensee action taken in response to selected I&E Information Notices:

I&E Information Notice 82-31: Overexposure of Diver During Work in Fuel Storage Pool. According to licensee representatives, no diving activities have been conducted during the past ten years, nor are any future dives anticipated. No specific diving procedures are on file. Licensee representatives stated procedures would be generated and approved before diving activities were conducted.

I&E Information Notice 83-59: Dose Assignment for Workers in Non-Uniform Radiation Fields. Based on pre-job surveys, the licensee badges that part of the body, except extremities, with the greatest anticipated exposure. This is recorded as the whole body dose.

I&E Information Notice 83-67: Emergency Use Respirator Material Defect Causes Production of Noxious Gases. The licensee does not have the Bio-Pac 60-P identified with this deficiency by this Notice.

I&E Information Notice 83-68: Respirator User Warning: Defective Self-Contained Breathing Apparatus Air Cylinders. The licensee is currently preparing a formal response to this Notice. Licensee representatives stated none of the components identified in this Notice were used at this station.

13. U.S. Ecology Inc. Waste Shipment

On April 19, 1984, a heat exchanger sent from Monticello to U.S. Ecology, Inc., Richland, Washington was discovered to have unabsorbed radioactive liquid in it when it was inadvertently breached at the Richland site. The liquid, estimated to be five to six gallons, was absorbed at the burial site and a sample was collected and analyzed by U.S. Ecology, Inc. The estimated activity of the liquid was 0.012 microcurie per milliliter. The presence of the free standing liquid inside the heat exchanger appears to be a violation of 10 CFR 30.41 which authorizes transfer of byproduct material to an individual authorized to receive it in accordance with a license issued by the Atomic Energy Commission (AEC), NRC, or an agreement

state. The U.S. Ecology, Inc. license, issued by the State of Washington, WN-1019-2 Section 27(A) states, in part, U.S. Ecology, Inc. shall not receive any liquids that have not be absorbed or solidified. Free standing liquid is not allowed to exceed 0.5% by volume. The State of Washington suspended Monticello's waste disposal permit for one week as a result of this incident. The State of Washington inspection findings are documented in more detail in NRC Inspection Report 84-03/15000046. Two subsequent shipments of heat exchangers from Monticello to U.S. Ecology were without incident.

14. Exit Meeting

The inspectors met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on June 29, 1984. The inspectors summarized the scope and findings of the inspection.

In response to certain items discussed by the inspectors, the licensee:

a. Acknowledged the violation concerning the radioactive waste shipment containing free standing liquid (Section 13).

b. Agreed to investigate the possible line losses of the General Atomic Wide Range Gas Monitors during postaccident sampling of radioactive iodines and particulates (Section 11).