U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-263/92014(DRSS)

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

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

Facility Name: Monticello Nuclear Generating Station

Inspection At: Monticello Site, Monticello, Minnesota

Inspection Conducted: October 13-16, 1992

M. Schumacher for

Inspector(s): N. Shah 11-3-92
Date

M. Schumacher

Approved By: M. C. Schumacher, Chief 11-3-92
Radiological Controls Section 1 Date

Inspection Summary

Inspection on October 13-16, 1992 (Report No. 50-263/92014(DRSS))
Areas Inspected: Routine unannounced inspection of the radiation protection (RP) program (Inspection Procedure (IP) B3750) including instruments and calibrations, audits and appraisals, training and qualifications, external exposure control and As Low As Reasonably Achievable (ALARA). Items identified in previous inspections and in Radiological Safety Deficiency Reports (RSDR) were also reviewed.
Results: No violations or deviations were identified. The licensee's radiation protection program appeared to be effectively implemented as indicated by good performance during several forced outages and aggressive contamination control initiatives. Source term reduction and ALARA initiatives continued with ongoing plans for a chemical decontamination during the 1993 refueling outage and the construction of a tool storage facility. Some minor weaknesses in radioactive material storage were observed in the Turbine Rotor Storage Building, but these were immediately corrected and will be reviewed further by the inspector. Licensee progress on monitoring onsite contaminated soil described in RSDR 90-01 will continue to be reviewed by the inspector.

DETAILS

1. Persons Contacted

*W. J. Hill, Plant Manager
*J. Windchill, Superintendent Radiation Protection
G. D. Mathiasen, Lead Health Physicist
K. Jepson, Superintendent Chemistry
D. L. Orrock, Supervisor Nuclear Plant Helpers
W. Shinnick, ALARA Coordinator
P. A. Yurczek, Radiation Protection Supervisor
R. L. Latham, Radiation Protection Coordinator
B. W. Denney, Health Physicist

*W. Stearns, Resident Inspector

The inspectors also interviewed other licensee personnel.
*Present at the Exit Meeting on October 16, 1992.

2. Licensee Action on Previous Inspection Finding (IP 92701)

(Closed) Open Item 50-263/91008-03: Licensee to develop program for surveying incoming "clean" laundry. All gloves are now surveyed by the laundry vendor prior to delivery. Upon receipt, licensee representatives survey all gloves and a representative sample of other protective clothing. A new laundry monitor has been purchased and procedures developed for its use. The monitor is scheduled to be installed prior to 1993. Based on these actions, this item is considered closed.

(Closed) Part 21 report concerning design deficiency in Eberline model AMS-3A Beta Particle Air Monitor. The licensee does not use this monitor therefore this item is considered closed.

3. Audits and Appraisals (IP 83750)

The inspectors reviewed the licensee's program for self-identification of problems, including Quality Assurance (QA) audits and Radiological Safety Deficiency Reports (RSDR).

QA audits and surveillances performed since the last inspection continued to be performance based, contained substantive findings, and resulted in timely corrective actions. Audits continued to be performed by auditors having the appropriate expertise in the functional areas assigned and covered the spectrum of radiation protection (RP) activities including observations of work, documentation and ALARA.

The inspector also reviewed RDSRs issued by RP management to document items of radiological concern. RSDRs reviewed by the inspectors are discussed below and in section 8.

RSDR 92-01 documents a worker who received an exposure greater than the job estimate while performing maintenance on the "H" safety relief valve (SRV). The licensee's investigation identified deficiencies in

dosimeter use, RP technician (RPT) coverage and job planning. Corrective actions were prompt and included revising the applicable procedures and incorporating the event into continuing RPT training. Although the exposure was well below administrative limits and licensee actions were timely, the inspector felt that this event was atypical of licensee ALARA performance and discussed it at the exit meeting.

No violations or deviations were identified.

4. Training and Qualifications (IP 83750)

The inspectors reviewed continuing training for professional RP staff and the training program for both station and contract RPTs.

Qualification as an RPT is based on successful completion of both classroom work and on-the-job training (OJT). Classroom training is conducted at the Monticello training facility and consists of a general overview of reactor physics and systems and radiation protection fundamentals and practices. A RPT typically spends 3 months in the classroom followed by 6 - 12 months of OJT. Only senior RPTs who have been approved by the RP Superintendent and have completed evaluator training can supervise OJT.

The licensee encourages RPTs to obtain certification with the National Registry of Radiation Protection Technologists (NRRPT) and considers it a prerequisite for promotion to senior RPT. Approximately 60% of the stations RPTs are NRRPT certified and the radiation protection supervisor has been on the certification exam panel for the last four years.

Prior to hiring, resumes of contract RPTs are reviewed by the radiation protection supervisor for compliance with ANSI N18.1-1971. Those RPTs selected are required to pass an exam on RP fundamentals followed by successful completion of Nuclear General Employee (NGET) and Monticello site specific procedural training. Although not a general practice, contract RPTs who fail the RP fundamentals exam may perform limited outage work with RP supervisor's approval. The inspector noted that contract RPT selection is at the discretion of the RP supervisor with limited input from upper RP management and that resumes are typically not verified. Although this approach has not resulted in any performance problems, the inspector cautioned the licensee that a more detailed review may be needed based on recent industry concerns regarding contract RPT qualifications.

Except for the ALARA coordinator, the licensee's professional RP staff appeared to receive periodic specialized training consistent with their responsibilities. Although the ALARA coordinator, a former RPT, appears qualified for his position based on performance to date, his ALARA training appears limited to occasional attendance at meetings of the BWR Owners ALARA group. The licensee agreed that supplemental training would be valuable and is reviewing available industry courses.

One notable enhancement to the professional HP staff is the completion of part I of the American Board of Health Physics certification process by the radiological services engineer. The engineer is attending training courses in preparation for part II and eventual full certification in reactor health physics.

No violations or deviations were identified.

5. External Exposure Control (IP 83750)

The inspector reviewed the licensee's external exposure control and personal dosimetry programs.

Selected radiation work permits (RWP) were reviewed for appropriateness of the radiation protection requirements based on work scope, location, and radiological conditions. During tours of the plant, the inspector observed the adherence of plant workers to the RWP requirements and discussed them with plant workers at the job site. The inspector further noted that the licensee has adopted the good practice of putting a green "revised" sticker with green dots indicating the specific changes on revised RWPs.

To date, station dose is 89 person-rem which is 76% of the station's established yearly goal. In 1990, the last year without a refueling outage, station dose was 94 person-rem. The higher 1992 expected dose reflects an additional 10 person-rem from dose intensive work performed during emergency diesel generator, safety relief valve (SRV) and reactor water cleanup (RWCU) maintenance forced outages. Of the non-outage work, the highest dose contribution was from spent fuel pool cleanup activities which resulted in 12.3 person-rem.

Each month the licensee exposes 16 thermoluminescencent dosimeters (TLD) to known amounts of radiation and includes them with the monthly TLD shipment. A varied sample set is obtained by exposing 10 TLDs to 500, 1000, 1500 and 2000 millirem of gamma and beta radiation during quarters 1 through 4, respectively. Of the remaining TLDs, 2 are exposed solely to beta radiation and 4 to gamma and neutron fields in the drywell. Both the actual exposure and the vendor's results are recorded on form 5713 "TLD Spiking Record" and attached to the monthly exposure report. A review of spiked TLD results indicated good agreement between vendor results and actual TLD exposure.

No regulatory or administrative overexposures were identified during a review of personal exposure records. The inspector also noted an average 8% conservative bias between the licensee's electronic dosimeters and TLDs.

No violations or deviations were identified.

6. Maintaining Occupational Exposures ALARA (IP 83750)

The inspector reviewed the licensee's program for maintaining occupational exposures ALARA including ALARA policy and procedures, planning and preparation, worker awareness and involvement.

a. ALARA Program/Organization

ALARA responsibilities are shared among the RP staff with the principal individuals being the Radiation Protection Advisory Committee (RPAC) members and the ALARA and RP coordinators. RPAC members include representatives from maintenance, operations, engineering, chemistry and radiation protection. ALARA policy is specified in Administrative Work Instruction (AWI) 4 AWI 8.04.01 "Radiation Protection Plan" which incorporates ALARA guidance and personnel responsibilities into 4 AWI 11.01.02 "ALARA Plan".

General oversight of ALARA is provided by the RPAC through the establishment of ALARA goals and periodic review of station performance. Management has committed to the practical use of procedures and engineering controls to maintain exposures ALARA and has established a value of $10,000 per person-rem saved to quantify tangible benefits. Prior to 1992, a value of $5000 per person-rem saved was allocated. Both the ALARA and RP coordinators oversee daily aspects of the ALARA program and contracted personnel have been used to augment outage support.

Discussions with both plant workers and management indicate that ALARA policies and responsibilities are well understood and communicated. Both weekly and monthly exposure status reports are distributed to department heads and reiterated in quarterly status reports developed by the ALARA coordinator. A review of RPAC meeting minutes indicate that this information is evaluated and incorporated into planning and goals.

b. ALARA Implementation

An "ALARA Writers Guide" has been incorporated into the ALARA plan to assist in the identification and implementation of ALARA concerns during procedure development. ALARA trigger levels have also been established to determine the proper level of management review. Estimated exposures upto 0.5 person-rem are reviewed by the RP coordinator; those above 0.5 person-rem are reviewed by the ALARA coordinator. Exposures between one and ten person-rem must also be authorized by the responsible system superintendent with additional approval by the plant manager for planned exposures of ten person-rem or greater.

Planning for both fuel pool cleanup and forced outage work (section 5) appeared to address ALARA concerns and were based on reasonable exposure estimates. Actual exposure accrued was typically less than the original estimate. Although some planning

weaknesses were identified (section 3), corrective actions appeared to be timely and effective. The inspector also noted that man-hour estimates provided to radiation protection by job supervisors were usually high, because they included time spent in non-radiological areas. This requires additional time spent by the responsible planner to determine actual exposure duration--time better spent on actual planning.

A computerized RWP experience database is maintained of all ALARA concerns identified in previous jobs. Database items are referenced by plant location and are used in tandem with planning worksheets from previous jobs. A new exposure data management system (PMETS) is being developed to interface the RWP experience database with the ALNOR electronic dosimetry system. When fully implemented, PMETS will complement RP responsibilities by providing for on-line dose monitoring and control over personnel access to radiological areas based on training qualifications, exposure status and RWP authorizations.

c. ALARA Initiatives

The licensee has a history of source reduction initiatives including ongoing replacement of stellite containing control rod blades, zinc injection via GEZIP, hydrogen water chemistry (HWC) and chemical decontaminations of recirculation piping during the 1989 and 1991 refueling outages. These efforts have resulted in decreasing cobalt-60 concentrations in reactor coolant from 1982 to date. Future plans include another decontamination of the recirculation piping using LOMI during the 1993 refueling outage and participation in an EPRI study on depleted zinc.

A video surrogate tour system (CVUE) has been used by the plant since 1989. Still pictures from the system have been included in job packages to aid in identifying system components and areas of radiological concern.

ALARA concerns and recommendations from the 1991 refueling outage have been assigned to supervisory personnel for resolution. Improvements to date include the construction of a tool storage facility near the tool decon area to facilitate accountability and modification of the main steam line plug installation/removal tool to correct identified problems.

A mockup was constructed and used to train both RP and maintenance personnel prior to the recirculation pump seal work (section 5). Slides of the job were also taken for use in future planning.

The licensee's ALARA program appears to be effective. Corporate policy and ALARA responsibilities have been incorporated into a detailed ALARA plan, which appears to be well understood by plant personnel. ALARA planning and review of work activities is typically good, although some weaknesses were noted. Management commitment towards source reduction

and ALARA initiatives have resulted in decreasing source term and exposure over the plant lifetime.

No violations or deviations were identified

7. Control of Radioactive Materials and Contamination, Surveys and Monitoring (IP 83750)

The inspectors reviewed the licensee's program for control of radioactive materials and contamination, including: calibration of contamination, survey and monitoring equipment; adequacy of review and dissemination of survey data; effectiveness of methods of control of radioactive and contaminated materials; and personal contamination events (PCE).

In accordance with 4 AWI 8.04.03 "Personal Contamination Control", minimum alarm setpoints are 5 and 150 nCi of cobalt-60 for whole body friskers at main access points and portal monitors, respectively. While whole body friskers are calibrated semi-annually, portal monitors are not routinely calibrated. However, they are functionally checked weekly. The inspector reviewed the alarm setpoint and verification methodology for whole body friskers and portal monitors; no problems were noted.

Since 1988, radiation protection has been tracking leaking and contaminated components for job planning and recovery purposes. A list of affected components is generated quarterly and provided to system engineers who are requested to initiate decontamination efforts. The list is also reviewed by the radiation protection advisory committee (RPAC). Progress to date has been good, with over 60% of components identified since 1991 decontaminated.

An aggressive program is in place to identify areas in need of decontamination (decon). Contamination action levels have been established for all plant areas except the drywell. If these levels are exceeded, a request is submitted to the plant helpers for decontamination. These requests are reviewed on a daily basis by the lead plant helper who schedules requests based on resource availability. Following a decon, the area is resurveyed and if necessary, deconned again. On a quarterly basis the frequency of decon requests is reviewed by the Superintendent Radiation Protection and the Plant Helper Supervisor. A list of decon requests per plant area is also generated yearly.

A selective review of PCEs and Hot Particle Events to date, did not identify any overexposures or violations of NRC requirements. The licensee investigates each PCE, conducts interviews with the individual and reviews related work activities; for each hot particle event, a skin dose assessment is performed. A monthly report summarizes the number of PCEs to date categorized by cause, source (clothing or skin contamination), plant location and work group. Where necessary, individual supervisors are notified of their workers' performance and in

the case of individuals with multiple PCEs, a response may be required. The inspectors reviewed the investigation and dose calculations for selected PCEs and Hot Particle Events; no problems were noted. Forty-four PCEs have been recorded in 1992 to date compared with 99 in 1990, the last non-outage year.

No violations or deviations were identified.

8. Low Level Activity on Soil within the Protected Area.

Radiological Safety Deficiency Report 90-01 describes the licensee's ongoing evaluation of low level cobalt-60 (Co-60) and cesium-137 (Cs-137) contamination found on soil inside the restricted area fence. Soil samples indicate general contamination levels between 50 and 100 dpm/100 cm^2, with two localized areas in the range of 500 to 1000 dpm/100 cm^2. Two of eighteen samples onsite but outside the restricted area fence showed 50 to I00 dpm/100 cm^2. The other sixteen samples were indistinguishable from background. Licensee representatives believe the activity results from deposition from airborne releases via the reactor building vent. This mechanism is recognized in the licensee's offsite dose calculational manual (ODCM) which lists soil deposition factors (D/Q). Licensee representatives indicated that preliminary calculations based on these factors were not inconsistent with the measured values. They are in the process of developing a program to routinely monitor this contamination.

This matter was discussed at the exit interview and in telephone discussions on October 26 and November 2, 1992. Licensee representatives will prepare a summary report, including any plans for soil disposition, when their evaluation is completed. This matter will be reviewed during future inspections (1FI 50-263/92014-01).

No violations or deviations were identified

9. Plant Tours

The inspectors made several facility tours throughout the inspection period to observe posting and labeling, radiological controls and personnel performing various jobs.

Routine radiological controlled area (RCA) surveys were found to be properly documented and reviewed. The inspectors noted surveys posted outside of all component rooms providing radiological information to anyone entering the area and identified no surface contamination or inaccurate radiation level postings during independent surveys.

The inspector toured the turbine rotor storage building which is a radioactive material storage area located outside the protected area fence and dual posted as a radiation and radioactive materials area. This building is normally kept locked with the key maintained by RP at access control and logged out with each use. Several radioactive material labels and a wooden box containing the feedwater sparager

alignment tool were observed in degraded condition, during the tour. In addition, another wooden box containing the fuel module lifting rig appeared unlabeled. This was discussed with the licensee who immediately resurveyed the area and replaced the degraded labels. The feedwater sparager alignment tool was found to be uncontaminated and the fuel module lifting rig was labeled, but not in a visible location. This was also corrected by the licensee. Based on these observations, the inspector was concerned over the maintenance of other radioactive material storage buildings located outside the protected area. The licensee plans to discuss the conditions in the turbine rotor storage building with the RP technicians and will review the other storage areas. Licensee progress will be reviewed during future inspections (IFI 50-263/92014-02).

No violations or deviations were identified.

10. Inspection Followup Items (IFI)

Inspection Followup Items (IFI) are matters which have been discussed with the licensee, will be reviewed further by the inspector and which involve some action on the part of the NRC, licensee or both. IFIs disclosed during the inspection are discussed in sections 2, 8 and 9.

11. Exit Interview

The scope and findings of the inspection were reviewed with licensee representatives (Section 1) at the conclusion of the inspection on October 16, 1992. There were no violations or deviations and the licensee did not identify any documents as proprietary. The following matters were specifically discussed by the inspectors:

- RP weaknesses identified in RSDR 92-01 (section 3)
- ALARA coordinator training (section 4)
- Contaminated soil identified in RSDR 90-01 (section 8)
- Condition of turbine rotor storage building (section 9)