

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 50-263/96010(DRS)

Licensee: Northern States Power Company

Facility: Monticello Nuclear Generating Plant

Location: 2807 W. County Rd. 75  
Monticello, MN 55362

Dates: October 28 through November 1, 1996

Inspector: R. Glinski, Radiation Specialist

Approved by: T. Kozak, Chief, Plant Support Branch 2  
Division of Reactor Safety

## Report Details

### **R1 Status of Radiation Protection and Chemistry (RP&C) Controls**

#### **R1.1 ALARA Practices for Loading a High Integrity Container (HIC) into a Transportation Cask**

##### **a. Inspection Scope (83750)**

The inspector reviewed the pertinent Radiation Work Permit (RWP), attended the pre-job briefing, interviewed personnel, and observed the transfer of a HIC containing condensate resin to a shielded transportation cask.

##### **b. Observations and Findings**

The dose rates on the HIC ranged to about 8 rem/h [80 millisieverts/hour (mSv/h)]. The pre-job briefing thoroughly covered the procedure and the RWP restrictions for the HIC transfer, and included a description of the ALARA and safety considerations for this task.

The inspector observed the transfer of the HIC from the storage cask to the shielded transportation cask. The licensee conducted this work outside the radwaste building. RP staff evacuated station personnel from the immediate area and staged several radiation protection specialists (RPS) around the area to prevent inadvertent access and to monitor dose rates. RP provided paper coveralls and an electronic dosimeter (ED) on the head of the rigger who worked nearest the HIC before and after the transfer. ED data indicated the rigger's dose for this task was 0.023 rem (0.23 mSv). The collective dose for this RWP, 0.129 person-rem (1.29 mSv), was low considering that the RWP covered the transfer of three HICs.

##### **c. Conclusion**

The implementation of radiological controls during the transfer of a HIC containing condensate resin was characterized by an effective pre-job briefing and efficient job management.

#### **R1.2 Implementation of the Unborn Child Protection Program**

The inspector reviewed the Radiation Protection Group Procedure, RPGP-02.08, "Monticello Unborn Child Protection Program", and interviewed station personnel who were trained on the program. The procedural requirements of RPGP-02.08 met applicable regulations and established conservative administrative dose limits. The individuals trained on the program indicated that the information they received was thorough, and that plant staff tracked their job assignments and radiation dose closely. Personnel in this program were prohibited from entering high radiation and contaminated areas. RP records indicated that the radiation dose received by individuals in the program was well below both the regulatory and administrative

limits. The inspector concluded that the licensee effectively implemented their unborn child protection program.

### R1.3 Walkdowns Within the Radiologically Controlled Area (RCA)

#### a. Inspection Scope (83750)

The inspector conducted walkdowns of various areas within the RCA. Additionally, the inspector reviewed records and interviewed RP staff regarding the control of radiological conditions within the plant.

#### b. Observations and Findings

During the plant walkdowns, the inspector independently verified selected survey data and noted that survey maps properly reflected plant conditions. Although the entire reactor and radwaste buildings were posted as radiation areas, the inspector identified several discrete areas within these buildings which met the criteria for a radiation area, however these discrete areas were not conspicuously posted as such. The inspector discussed with RP management the NRC guidance which states that the practice of posting the entrances of buildings does not provide personnel with sufficient information to minimize their exposure and that discrete radiation areas within a large area should be reasonably posted. In response, the RP staff posted one area and indicated that the issue of posting discrete radiation areas within these buildings would be reviewed.

In general, housekeeping was good and no significant radiological impediments to routine work activities existed. The RP staff indicated that areas within the radwaste building were recently decontaminated and that decontamination of the A RHR room is planned after completion of the pump seal replacement. There were no areas which were rendered inaccessible due to high contamination levels. Control of contamination was excellent as evidenced by the fact that there have been only twelve non-outage personnel contaminations, each of which involved discrete particles.

The inspector noted that postings and control of contaminated areas, hot spots, and special status areas were appropriate. The licensee closely tracked the location of all hot spots and special status areas, with quarterly surveys to verify postings. There were only twelve hot spots in the plant. The licensee has continued its program to reduce the source term, as low pressure turbine components which contained cobalt were recently replaced and four control rod blades with cobalt are scheduled for removal in the next outage.

#### c. Conclusion

The RP staff has continued to exercise excellent control of radiological conditions within the plant, as evidenced by decontamination activities, housekeeping, the tracking of special status areas, the low number of personnel contaminations, and source term reduction activities. However, the inspector identified that the RP

practice of posting the entire reactor and radwaste buildings as radiation areas was inconsistent with NRC guidance. This issue will be reviewed as an Inspection Follow-up Item (IFI 50-263/96010-01).

R1.4 ALARA Planning and Implementation for the "A" Residual Heat Removal (RHR) Pump #11 Seal Replacement Task

a. Inspection Scope (83750)

The inspector reviewed the ALARA planning and the RWP package for the RHR pump #11 seal replacement job. The inspector also interviewed RP staff regarding ALARA planning for this task and observed work in progress.

b. Observation and Findings

The inspector noted that RP staff conducted the ALARA planning for this task in accordance with station procedures. The job planning worksheets addressed ALARA and job efficiency measures. The job planning was conducted by RP and maintenance staff, and the RWP package received the appropriate supervisory review. The ALARA and contamination control measures for the job included the following: (1) use of blower face shields and full protective clothing (PC) for the workers, (2) extensive RP job coverage, (3) control and removal of contamination with strippable paint, (4) double step-off-pads, (5) staging a high efficiency particulate air filter (HEPA) at the RHR bowl, (6) constructing a platform over the RHR piping for lead shielding, and (7) spray bottles to keep surfaces damp and prevent airborne radioactivity.

Pre-job survey results showed that the contamination levels on the floor and RHR equipment were very high. The contamination/airborne controls were effective as demonstrated by the fact that the highest airborne concentration detected during this job was 0.13 DAC (Derived Air Concentration), which was very low considering the loose contamination levels in the work area.

The inspector observed that the planned ALARA measures were implemented effectively by station personnel. However, the inspector identified one instance of an inappropriate RP practice. As a worker was removing contamination from the RHR bowl with a gloved hand, he would then wipe the glove on the PC. When the inspector notified RP staff, the RPS covering the job provided the worker with a wipe to remove contamination from his gloves. This worker later alarmed the friskall at access control and RP determined that the underall was slightly contaminated. The ALARA measures were successful in limiting the total dose to 1.56 person-rem (15.6 mSv), which was reasonable for the work accomplished.

c. Conclusion

The radiological planning and implementation for the RHR pump seal replacement was effective as evidenced by the low dose accumulated and minimal contamination control problems during the job.

## R2 Status of RP&C Facilities and Equipment

### R2.1 Calibration and Function Checks of Radiation Detection Instrumentation

#### a. Inspection Scope (83750)

The inspector reviewed calibration and function check procedures, records, and activities for the EDs, portable survey meters, friskers, friskalls, portal monitors, tool monitors, and the whole body counter (WBC). The inspector also interviewed calibration personnel.

#### b. Observations and Findings

The inspector observed that the available radiation detection meters were in compliance with the Updated Safety Analysis Report, Section 7.5.4, Health Physics and Laboratory Radiation Measuring Instruments. A review of calibration records for 1996 indicated that instrument calibrations have been conducted in accordance with station procedures with regard to frequency and radiation range and the inspector did not identify any material condition concerns. The inspector noted that the RPS primarily responsible for calibrations was knowledgeable and that the calibration facility was well maintained. Out-of-service meters were physically segregated to prohibit their use. Throughout this inspection, all the instruments observed in the plant were within calibration.

The inspector identified one issue regarding the calibration of the gas-flow proportional smear counters. When plateaus were generated to determine the operating voltage, the station practice has been to choose the operating voltage at the "top of the knee" as indicated on the plateau. However, standard industry practice and the technical instruction of the vendor indicate that the operating voltage should be chosen "50-75 volts above the knee" of the plateau. Following the vendor recommendation would ensure that a change in the instrument voltage would result in a minimal change in detector efficiency, whereas a change in voltage from the "top of the knee" could result in a significant decrease in detector efficiency with the potential for an inadequate assessment of radiological conditions. RP management indicated that this issue would be reviewed. The licensee's operation of the smear counters will be reviewed during a future inspection (Inspection Follow-up Item 50-263/96010-02).

The inspector observed that the functional checks of the radiation detection instruments were performed at the frequency prescribed in station procedures. The inspector also noted that functional checks for most of the fixed monitors were conducted with sources having activity comparable to the alarm set points, ensuring that the instrument would alarm as required.

The WBC was calibrated with a radionuclide mix traceable to the National Institute for Science and Technology (NIST). The inspector noted that the WBC functional checks were performed as specified and that both the peak location and source activities for two radionuclides were tracked.



Interviews with the RP staff indicated that there have been very few operability problems with the radiation detection instrumentation.

c. Conclusion

Observation of activities and the performance history for regular function checks indicated that calibration and operability of the radiation detection instruments has remained excellent.

**R4 Staff Knowledge and Performance in RP&C**

**R4.1 Unconditional Release of Bulk Material**

a. Inspection Scope (83750)

The inspector reviewed the station procedure and data for the unconditional release of bulk material. The inspector also discussed the current practice with RP management.

b. Observations and Findings

The inspector noted that the station procedure provided the staff with adequate guidance for the collection and counting of bulk material samples. RP/Chemistry data indicated that the current detection capability was consistent with the Lower Limits of Detection (LLD) specified in NUREG-0473, Standard Radiological Effluent Technical Specifications (RETS), for sediment samples. The capability to achieve sediment LLDs is considered sufficient for dry solid material. However, to ensure that no radioactive material (RAM) is released from the site in bulk liquids, the industry accepted LLDs are the LLDs specified in the RETS for water. RP management acknowledged that the current station procedure did not meet this standard. To date, there has been no indication that RAM in bulk liquid material has been released from the site.

c. Conclusion

The RP procedure for the unconditional release of bulk material was adequate to prevent the release of RAM in dry solid material. However, the procedure did not require the industry accepted detection limit capabilities for the unconditional release of bulk liquid material. This lack of a procedural requirement to achieve industry accepted detection limits is considered a program weakness and will be monitored as an Inspection Follow-up Item (IFI 50-263/96010-03).

#### **R4.2 RP&C Response to a Discharge Canal Radiation Monitor Alarm**

##### **a. Inspection Scope (84750)**

The inspector interviewed RP personnel and reviewed documentation regarding the alarm of the discharge canal radiation monitor which led to a Notification of an Unusual Event (NUE).

##### **b. Observations and Findings**

At 0300 on October 17, 1996, the licensee declared an NUE in response to the alarm of the discharge canal radiation monitor (DCRM) at a radiation level of 20 counts per second (cps). The purpose of the DCRMs is to monitor and alert station staff to a possible release of radioactive material from the plant. At about midnight there was a heavy rainstorm and chemistry personnel had observed that the DCRM was trending upward. This has been a common phenomenon at the plant, and previous data indicated that precipitation "washed" radon daughters from the atmosphere and deposited them in surface waters.

At 0200 the radiation level had reached 10 cps, which is the chemistry department alarm point, and a chemistry technician collected a grab sample. Gamma spectrometry analysis demonstrated levels of radon daughters which were several times above normal levels. In addition to the discharge canal, the service water radiation monitor indicated that radiation levels in the service water had nearly doubled during this same time. Therefore, the licensee determined that DCRM alarm was caused by an increase in natural radionuclides.

##### **c. Conclusion**

The inspector reviewed the response and assessment of the RP&C staff to the DCRM alarm on October 17, 1996, and determined that the actions were appropriate.

#### **R7 Quality Assurance in RP&C Activities**

##### **R7.1 Quality Assurance for Personnel Dosimetry**

##### **a. Inspection Scope (83750)**

The inspector reviewed quality control (QC) records for personnel dosimetry and interviewed the Senior Health Physicist (SHP) regarding the overall quality of the dosimetry analyses.

##### **b. Observations and Findings**

The SHP indicated that the TLDs used for personnel dosimetry were processed by a vendor laboratory. The inspector verified that the vendor has maintained its National Voluntary Laboratory Accreditation Program (NVLAP) accreditation for TLD

dosimetry for Categories I-IX through September 1997. A review of the vendor's Quality Assurance and Status reports indicated that the overall quality of the vendor's dosimetry capabilities for a variety of dosimeters has remained excellent.

The inspector also reviewed the licensee's TLD quality control (QC) data. The licensee's TLD QC program consisted of the vendor's analysis of TLD badges which had been exposed to known quantities of radiation at the site or by an independent third-party laboratory. The results of the onsite exposed badges for the first quarter of 1996 were 22% below the known value. In accordance with plant procedures, the RP staff investigated this discrepancy and concluded that a personnel error in the radiation exposure to the test badges was a possible cause. The results from all the other QC tests were excellent.

c. Conclusion

The licensee continued to ensure that the capability of their dosimetry vendor has remained excellent.

**R8 Miscellaneous RP&C Issues**

- R8.1 (Discussed) Inspection Follow-up Item 50-263/96005-07: Steam from the manifold vent of a turbine flow element/indicator entered and contaminated the turbine building normal drain sump. On May 29, 1996, steam from the manifold vent condensed against a wall and a portion of the water stream entered a non-radioactive drain which leads to the turbine building normal drain sump (TBNDS). The TBNDS radiation monitor reading increased and a grab sample showed  $3.2\text{E}-8$  microcurie per milliliter of fluorine-18. Thus far, the licensee has requested that the training department develop material addressing the need to notify chemistry personnel when there is a potential radiation effluent discharge. In addition, plant staff are evaluating the adequacy of the TBNDS radiation monitoring capability. This item remains open.

**X1 Exit Meeting Summary**

The inspector presented the inspection results to members of licensee management during an exit meeting on November 1, 1996. The licensee did not indicate that any materials examined during the inspection should be considered proprietary.



## PARTIAL LIST OF PERSONS CONTACTED

### Licenses

J. Windschill, General Superintendent, Radiation Services  
G. Mathiasen, Senior Health Physicist  
P. Yurczyk, Radiation Protection Supervisor  
R. Latham, Radiation Protection Coordinator  
W. Shamla, Quality Assurance Supervisor

### NRC

A. Stone, Senior Resident Inspector, Monticello  
J. Lara, Resident Inspector, Monticello

## INSPECTION PROCEDURE USED

IP 83750, "Occupational Exposure"

## ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

50-263/96010-01	IFI	Posting entire reactor and radwaste buildings as a radiation area.
50-263/96010-02	IFI	Operation of smear counters inconsistent with vendor instructions.
50-263/96010-03	IFI	Survey procedure does not require industry accepted LLDs for the unconditional release of bulk liquid material.

### Discussed

50-263/96005-07	IFI	Steam from the manifold vent of a turbine flow element/indicator entered and contaminated the turbine building normal drain sump.
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### LISTING OF DOCUMENTS REVIEWED

Updated Safety Analysis Report Sections 7.5, 12.3, and 12.5.

Monticello Radiation Protection Group Procedure RGP-02.08, Revision 1, "Monticello Unborn Child Protection Program".

Monticello Radiation Protection Procedure (RPP) R.09.23, Revision 4, "TLD Spiking Test".

RPP R.14.06, Revision 2, "Routine TLD Data Entry".

RPP R.01.06, Revision 1, "RWP ALARA Reviews".

RPP R.02.02, Revision 10, "Dose Rate Surveys".

RPP R.02.02, Revision 13, "Surface Contamination Surveys".

RPP R.09.01, Revision 8, "Fastscan QA Calibration Check".

RPP R.09.04, Revision 16, "Smear Counter Function Checks".

Radiation Work Permit (RWP) 267, "Transfer Resin Liner to Shipping Cask".

RWP Package 259, "A RHR #11 Pump Seal Replacement".