U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-263/83-05(DRMS)

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

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

Facility Name: Monticello Nuclear Generating Plant

Inspection At: Monticello Site, Monticello, MN

Inspection Conducted: February 22-24, 1983

Inspectors: J. P. Patterson — March 17, 1983

M. P. Phillips — 3/18/83

Approved By: W. L. Axelson, Chief — 3/18/83
Emergency Preparedness Section

Inspection Summary:

Inspection on February 22-24, 1983 (Report No. 50-263/83-05(DRMS))
Areas Inspected: Routine announced inspection of the Monticello emergency preparedness exercise involving observations by six NRC representatives of key functions and locations during the exercise. The inspection involved 128 inspector hours onsite by two NRC inspectors and four consultants.
Results: No items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

NRC Observers and Areas Observed

C. Brown, Control Room
C. Corbit, Control Room and Technical Support Center (TSC)
G. Bethke, TSC and Emergency Operations Facility (EOF)
J. Patterson, TSC and Offsite Monitoring Team
M. Phillips, EOF
G. Stoetzel, Operational Support Center (OSC) and In-Plant Health Physics
G. Martin, OSC and Offsite Monitoring Team

Nothern State Power Company and Areas Observed

E. Ward, Manager, Nuclear Environmental Services, Headquarters Emergency Center (HQEC)
J. Gonyeau, Manager, Production Training, Roving Controller
G. Earney, Power Production Training, Chief Controller
M. Agen, Power Production Training, Roving Controller
M. Onnen, Site Superintendent/Shift Supervisor, Control Room
D. Shaw, Controller, Control Room
M. Brant, Controller, Control Room
W. Shamla, Plant Manager, Emergency Director, TSC
S. Pearson, Group Leader, Operations, TSC
W. Anderson, Group Leader, Maintenance, TSC
R. Scheinost, Group Leader, Support, TSC
M. Clarity, Group Leader, Engineering, TSC
J. Pasch, Group Leader, Security, TSC
B. Schmitt, Controller, TSC
D. Howard, Controller, TSC
W. Albold, Superintendent of Maintenance, OSC Coordinator
E. Reilly, Lead Controller, OSC
D. Horgen, Controller (Field Survey), OSC
D. Orrock, Controller (Field Survey), OSC
M. Davis, Controller, (In-Plant Sampling), OSC
D. Schwanke, Controller, OSC
P. Yurczyk, Radiation Protection Coordinator
L. Eliason, General Manager Nuclear Power Plants, Emergency Manager, EOF
S. Hammer, EOF Coordinator
R. Nienaber, Logistics Coordinator, EOF
B. Day, Technical Support Supervisor, EOF
G. Goering, General Superintendent Nuclear Technical Services, EOF
R. Stenroos, Radiation Protection Support Supervisor, EOF

All of the above persons were present at the exit interview.

2. General

An exercise of the licensee's Emergency Plan was conducted at the Monticello Nuclear Generating Plant on February 23, 1983, testing

the response of the licensee, State, and local agencies to a simulated emergency. The exercise tested the licensee's and the State and local agencies' capability to respond to an accident followed by a simulated major release of radioactive material. This response also included recovery operations utilizing the licensee's Radiation Environmental Monitoring Program (REMP) teams and other support groups. The scenario is described in the attachment to this report.

3. General Observations

a. Procedures

This exercise was conducted in accordance with 10 CFR 50 Appendix E requirements using the Monticello Nuclear Generating Plant Emergency Plan and the Emergency Plan Implementing Procedures (EPIPs).

b. Coordination

The licensee's response was coordinated, orderly, and timely. If the event had been real, the licensee's actions would have been sufficient to permit the State and local authorities to take appropriate actions for protection of the public.

c. Observers

Licensee representatives and six NRC observers observed and critiqued this exercise.

d. Critique

The licensee held a critique on February 23, 1983, immediately after the exercise.

The NRC critique, identifying weaknesses and areas for improvement, was held at the EOF on February 24, 1983. In addition, a public critique was held on the evening of February 24, 1983, to present both the onsite and offsite findings by the NRC and FEMA representatives, respectively. This was held in the Wright County Courthouse, Buffalo, Minnesota.

4. Specific Weakness Noted

The weakness identified by the NRC observers was the lack of capability to perform dose assessment calculations at the EOF. These dose assessment calculations were done to some extent at the TSC but all contributing parameters could not be utilized by the TSC equipment. This will be corrected upon completion of the new MIDAS dose assessment system. Other minor weaknesses are listed under Specific Observations, Section 5.

5. Specific Observations

a. Control Room

Overall the Control Room operations were well coordinated and functioned adequately. Control Room personnel did not require use of any contingency messages. Communications were adequate. Although one telephone connection with the TSC was inoperable, another telephone line was substituted. Classification by the Shift Supervisor (SS) for both the Alert and Site Area Emergency levels was made promptly and accurately using the plant's Emergency Plan Implementing Procedures (EPIPs). When conditions existed so that the EPIPs would call for a General Emergency as recognized by the Shift Technical Adviser (STA) and Shift Supervisor(SS), the TSC Controller overruled the Control Room so the exercise could proceed along the scenario. A revised EPIP was issued after the final submission of the scenario and these personnel reacted properly in recognizing a General Emergency condition.

NRC observers noted that the amount of time the Shift Supervisor spent on the telephone with the TSC in the first 1-2 hours of the exercise was excessive. His time could have been better utilized in managing the emergency rather than being on the telephone. This was also identified by licensee controllers.

b. Technical Support Center (TSC)

Activation of the TSC was orderly and timely. Command and control functions performed at the TSC were good. The Emergency Director (ED) made timely announcements on reactor conditions and used his supporting staff well in making decisions to mitigate the accident. The ED also properly used the EPIPs in classifying the Loss of Coolant Accident (LOCA) with failure of the Emergency Core Cooling System (ECCS) as a General Emergency. He was about to declare a General Emergency about 9:23 AM, when the Controller interceded. Similiar action took place in the Control Room as described in Paragraph 5a.

The TSC status boards were well kept and data posted was relevant. Timely updates were made by a Recorder. A separate board was kept showing the radiation levels in various portions of the reactor building, administration section, and other outlying areas where the scenario data indicated radiation levels had increased above normal conditions. This was very useful to the TSC particularly when considering dispatching emergency teams into some of these areas.

Accountability and site evacuation were implemented in a professional, timely manner. Personnel were accounted for by using a card reader in the TSC. This card reader malfunctioned due to personnel inserting and withdrawing their badges too quickly, and all personnel from the TSC, OSC, and Control Room had to repeat

the procedure. One individual stationed at the card reader inserted all the badges individually, and the problem was resolved. Accountability for all plant personnel was accomplished in less than 20 minutes.

Radiation detection instruments do not contain calibration stickers. The licensee's EPIPs require quarterly calibration and instrument checks but no calibration stickers are placed on the instrument. These emergency instruments should have calibration stickers on them so that personnel using these instruments will be aware of their current calibration status.

The operators failed to use drywell spray pursuant to their procedures following the LOCA. This resulted in inconsistent drywell and torus temperature and pressure data from the scenario during the exercise. Scenario data showed the spray system to be operating. Drywell radiation level data appeared to be low by a factor of 10 with respect to coolant activity, drywell atmosphere concentrations, and release rates.

Dose calculations were not performed in the "projection mode," i.e., using drywell radiation levels, drywell/core fission product inventory, and assumed leakage rates. Dose calculations performed on a DEC machine in the TSC used only the measured main stack release rate. This information was then telephoned to the EOF. Dose assessment calculation utilizing all relevant radiation or reactor related parameters should be used, and this capability should be in the EOF as well as the TSC. 10 CFR 50.47 (b)(9) requires dose assessment of actual or potential offsite consequences of a radiological emergency. Accordingly, the licensee must be capable of performing dose assessment utilizing the containment dome monitor and containment air samples. This item is discussed further in Paragraph 5.d.

Dose assessment based on potential releases will be examined in detail pursuant to generic letter 82-33. This is an Open Item (83-05-01) This item is discussed in Paragraph 5.d.

c. Operational Support Center (OSC)

The OSC was activated in a timely manner. The tag board with names and assignment for emergency dispatch teams was completed in about 15 minutes. The OSC Coordinator was in charge of personnel in the Instrument and Controls (I&C) Shop. This was a staging area for maintenance personnel and electricians.

An improvement item from last year's exercise report (Report No. 50-263/82-04) recommended relieving the OSC Coordinator of some of his duties to minimize fatigue and stress. This was done by dividing the OSC into two areas. The Radiation Protection Coordinator took charge of the Access Control Point. The OSC Coordinator, as stated above, managed the I&C Shop.

This division of responsibility worked well in reducing the OSC Coordinator's work load. This item is closed.

Maintenance crews and electricians were dispatched from the I&C Shop to the Access Control Point where they received dosimetry and were briefed on radiation conditions. Health Physics personnel developed Radiation Work Permits (RWPs) for all in-plant entry and issued high range and extremity dosimeters when necessary.

The licensee obtained a reactor coolant sample and a containment atmosphere sample using the new post-accident sampling system (PASS) located on the 951 foot level of the turbine building. Samples were obtained within one hour after arriving at the sample location. The teams demonstrated their ability to don protective clothing and respiratory equipment. This aspect was not simulated.

Habitability surveys were performed in the OSC and at the Access Control Point. No communication problems were observed. In-plant teams were equipped with radios to communicate with the OSC and the Access Control Point.

A General Emergency was declared at approximately 10:00 AM. As late as 10:30 AM, the chemistry technicians collecting post accident samples were unaware of the upgrade. Noise level in the area may have prevented them from hearing the announcement. The licensee should assure that changes in emergency classification are transmitted over the plant intercom.

The chemistry technicians collecting post accident samples did not complete the sampling and analysis checklists designated in Procedures A.2-413 and A.2-415. These should be filled out during sample collection.

d. Emergency Operations Facility (EOF)

The permanent EOF, which is located in the Monticello Training Center, was activated in accordance with the emergency plan in a timely and realistic manner. Security procedures were good, including badging and posting of guards at the entrance to the EOF. Command and control at the EOF was excellent, especially the method of transfer of responsibilities from the TSC to the EOF. Radiological habitability monitoring in the EOF was begun upon EOF activation. Dosimeters and film badges were distributed shortly after activation of the EOF to all personnel. Administrative support at the EOF was good. All messages were logged and filed for future reference.

The Emergency Manager made good use of the technical support personnel available in the EOF. Upon initial activation of the EOF, the technical support group began trending of drywell temperature, reactor level, and reactor pressure. EOF updates were conducted periodically. Status boards were current and indicated the trend of all parameters being recorded.

The coordination between the Emergency Manager at the EOF and the State Department of Health for emergency classification and protective action recommendation changes was very good and very timely. All protective action recommendations were discussed and agreed to. This resulted in very prompt notification of the State of emergency classification changes; however, the time taken to notify Sherburne County was in excess of fifteen minutes on most occasions. This was because the offsite communicator routinely notified the Headquarters Emergency Center prior to notifying this primary affected county. This should be corrected in the appropriate notification procedures to ensure that both counties are notified within 15 minutes of emergency declaration as required by 10 CFR 50, Appendix E.

When the initial protective action to shelter a five mile keyhole was given to the State (at 9:24), licensee personnel did not perform any dose assessment or obtain dose assessment projections on potential release amounts due to predicted core degradation, resultant activity release to containment, and eventual release. In addition, the projected integrated dose posted in the EOF as the release was ending did not include the dose already received during the major portions of the release.

The personnel and equipment available at the EOF were such that offsite dose assessment could not be performed at this facility, even though it is responsible for radiological and environmental assessment coordination. EOF personnel obtained dose assessment information from the TSC; however, the information provided was based only on release data and was not received in a timely manner at the EOF. Several instances were observed when current dose projections were requested by the Emergency Manager and the data was not yet available. No default values were available to determine offsite consequences prior to a release, so the sheltering recommendation was chosen. Although this recommendation was upgraded to evacuation approximately one-half hour later, the goal should be to evacuate people prior to the release to obtain minimal exposure.

One of the primary functions of the EOF is the determination of recommended public protective actions. Section 4.1 of NUREG-0696 states that the EOF will be used to evaluate the magnitude and effects of actual or potential radioactive releases from the plant and to determine offsite dose projections. Facilities used in performing essential EOF functions must be located within the EOF complex. Although the TSC may be called upon to perform this function initially, it will normally be implemented in the EOF. Therefore, the primary location for the dose assessment capability should be the EOF.

The inspector learned after the exercise that permanent offsite dose assessment capability at the EOF should be operational by July 1, 1983. Software and hardware are both onsite now. The package purchased represents a Canberra MIDAS system.

Communications between the field monitoring teams and the EOF were good. The flow of offsite radiological monitoring data between the EOF and the State was excellent. Data was sent from the State EOC to the EOF containing the results of surveys conducted by the State, and similarly, licensee team data was faxed to the State EOC. The use of Weather Systems International for forecast weather data was good; however, wind speed and direction was listed for only the eight cardinal directions in miles-per-hour, rather than in degrees.

Field samples were brought to the EOF for analysis. The lab technician displayed good contamination control for field samples. The counting procedure utilized should include the UN (Units) method as routine rather than the QU (Quantity). This will determine uCi/ml rather than uCi only. The 0.6 cm shelf is the only shelf calibrated for charcoal cartridge samples. The highest counting shelf available should also be calibrated to increase the range of sample activity that can be determined. When the snow sample was brought to the EOF, it was not marked to indicate sample size (e.g., square centimeters or milliliters). In addition, the technician did not have a procedure or equipment for melting the snow and counting it in a calibrated geometry. These problems should be corrected in the sampling and analysis procedures.

The licensee did not downgrade the emergency classification based on conditions within the plant, but rather had to wait for a reduction in the ground deposited radioactivity. The emergency classes are designed for escalating events, rather than deescalating events. Upon determination that the plant is in a stable state and little potential for any release exists, a Recovery Mode should be entered.

e. Offsite Monitoring Teams

From a radiological standpoint, the offsite monitoring teams performed well. The TSC and later the EOF radio operators did a good job of keeping the teams informed on the latest plant status. Radio procedures and communications with the teams were good and the recording of data to the plant was also good. The monitoring team members demonstrated a good working knowledge of their required functions and utilized their procedures adequately.

Some problems were encountered relating to maps, radio contact, locating sample stations, and survey kit equipment. Markings of survey points and road locations varied between maps carried by the survey teams. These maps should be thoroughly reviewed for accuracy and consistency to resolve the differences. Some difficulties were encountered in determining the exact location to collect some samples. Sample locations and TLD stations should be clearly marked for ease of location by field monitoring teams. This could be by signs on posts or other markings with number of sample location.

Radio communication between the EOF and one offsite team was erratic at times. A radio survey should be performed to determine "dead" spots. Although offsite teams were authorized to receive exposure up to approximately 2 rems, the dosimeters available to the teams had a maximum range of 0-1R. Offsite survey kits should contain 0-5R dosimeters to enable team members to determine when their doses are approaching the limits. When only two teams are available for offsite monitoring, it is a poor use of manpower to use one team monitoring behind the plume when the priority should be to accurately locate and map the plume. (Note: A licensee representatives in the EOF stated this was done based on an inquiry from someone at the NRC Region III Incident Response Center.)

The offsite monitoring teams from the Monticello plant were not given an opportunity to actively participate because they were recalled to soon. For future emergency exercises the Monticello site teams should be permitted to make some initial surveys including reporting data to the TSC before being relieved by the teams from the Prairie Island plant.

f. Headquarters Emergency Center (HQEC) and the Joint Public Information Center (JPIC)

These two facilities were activated by the licensee for this exercise, however, there were no NRC observers present at either location. The JPIC was observed by FEMA.

6. Exit Interview

The inspectors held an exit interview on February 24, 1983, at the conclusion of the licensee's critique with representatives denoted in Paragraph 1. Licensee management agreed to address the inspectors' concerns.

Attachment: Exercise Scenario Outline

Exercise Scenario

0730 Initial Conditions

Monticello Nuclear Generating Plant is operating at full power.

All identified leakages = 0.75 gpm and unidentified leakages = 0.5 gpm (and steady).

Wind is out of the SSW (202°) at 5 mph and temperature is 26°F.

0800 A significant leak of 60 gpm is indicated in the Drywell Floordrain Sump. The reactor should be scrammed by the operators. The #12 Reactor Feed Pump is taken off as part of normal scram procedures.

An ALERT should be declared by the Shift Supervisor and the proper notifications and activation of the emergency organization be performed.

0830 The Drywell pressure ≧ 2 psig.

The ECCS is initiated but due to the unexpected lockout of BUS #16 and Bus #14, the #12 CRD Pump, #12 Core Spray Pump, #12 and #14 LPCI Pumps, and #12 Condensate Pumps are lost.

0900 A Design Basis Accident LOCA occurs. Leak rate increases beyond core make up capacity. The Reactor Vessel level drops below Top of Active Fuel (-114 inches).

A SITE AREA EMERGENCY should be declared.

The Reactor Vessel depressurizes to Drywell Pressure which peaks at about 36 psig.

HPCI and RCIC isolate on low static pressure.

Core Spray Pump #11 trips.

The #11 Reactor Feed Pump trips because #11 Condensate pump trips.

0930 Reactor Vessel Level increased to 1/3 core height.

Drywell pressure h s decreased to 25 psig.

1000 A release to the environment is indicated by the Stack Gas Monitors via failed open drywell vent valves through the SBGT system. The Stack Gas Monitors indicate a release rate of about 2E9 µCi/sec.

A GENERAL EMERGENCY should be declared based on the indicated release rate.

1030 The #11 Core Spray pump is restored.

1100 One of the two failed Drywell Vent Valves has been closed. As a result, the radioactive release to the environment has been terminated.

1130 The #11 Condensate Pump is restored to service.

1150 The emergency may be downgraded to a SITE AREA EMERGENCY once the surrounding area dose rates allow.

1200 The exercise will be terminated with all onsite plant participants with the exception of the TSC staff and radiation protection group. All off-site emergency organizations will continue with the exercise.

1200/
1230 Lunch Break for exercise participants.

1230 BRIEFING FOR 1-DAY TIME ADVANCE

1. Update of Plant Parameters/Conditions and Environmental Parameters:

   * Plant is at Cold Shutdown
   * Initial samples indicate ground contamination levels of about 3000 dpm/100 cm^2 due to Iodine-131.
   * Ambient γ levels in the affected sectors < .1 mR/hr
   * The plant is at the SITE AREA EMERGENCY
   * Public remains evacuated from the affected sectors.
   * #16 and #14 Bus returned to service.

1300 ONE-DAY ADVANCE - Begin Real Time 1300 Thursday, February 24, 1983

State survey teams and NSP EREMP personnel should sample the environment (snow, milk, feed, ambient γ levels).

State labs are reporting the analysis of snow, milk, and feed samples that were received from the morning.

The #11 RHR pump fails due to seizure. Operations Committee convenes to discuss repair plans.

1400 Environmental sample analysis show no food contamination. The ground contamination ~ .13$\mu Ci/m^2$ Iodine - 131. The emergency level may be deescalated to the NUE level. It is anticipated that the public will be allowed to reenter the affected sectors.

1500 Final news releases issued and close out of JPIC.

Close out of all other Emergency Operating Centers.