

August 14, 1998

Mr. M. Wadley  
President, Nuclear Generation  
Northern States Power Company  
414 Nicollet Mall  
Minneapolis, MN 55401

SUBJECT: NRC PRAIRIE ISLAND EMERGENCY PREPAREDNESS EXERCISE  
INSPECTION REPORTS 50-282/98012(DRS); 50-306/98012(DRS)

Dear Mr. Wadley:

On July 24, 1998, the NRC completed an inspection of your emergency preparedness biennial exercise at the Prairie Island Nuclear Generating Plant. The purpose of this inspection was to evaluate the performance of the emergency response organization during the exercise. The enclosed report presents the results of that inspection.

Areas examined within your emergency preparedness exercise performance are identified in the report. Within those areas, the inspection consisted of a selective examination of procedures and representative records, observation of performance, and interviews with staff. The objective of the inspection effort was to determine whether the Emergency Plan was adequate and station personnel were capable of implementing the Emergency Plan in accordance with NRC requirements. Based on the results of this inspection, no violations of NRC requirements were identified.

Overall performance during the 1998 Emergency Preparedness exercise was effective and demonstrated that your emergency plan implementation activities met regulatory requirements. Performance in the Control Room Simulator was effective and demonstrated correct emergency classifications and good teamwork. The Technical Support Center staff provided proactive emergency action level reviews and extensive decision-making and event mitigation. The Operations Support Center performed well in coordinating activities and maintaining control of repair teams. The Emergency Operations Facility staff's performance to a challenging scenario was competent and provided correct and timely classifications and protective action recommendations to offsite agencies.

M. Wadley

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In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room (PDR).

Sincerely,

/s/ S. A. Reynolds (for)

John A. Grobe, Director  
Division of Reactor Safety

Docket Nos.: 50-282; 50-306  
License Nos.: DPR-42; DPR-60

Enclosure: Inspection Reports 50-282/98012(DRS); 50-306/98012(DRS)

cc w/encl: Plant Manager, Prairie Island  
State Liaison Officer, State  
of Minnesota  
State Liaison Officer, State  
of Wisconsin  
Tribal Council  
Prairie Island Dakota Community

M. Wadley

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REGION III

Docket Nos: 50-282; 50-306  
License Nos: DPR-42; DPR-60

Report Nos: 50-282/98012(DRS); 50-306/98012(DRS)

Licensee: Northern States Power Company

Facility: Prairie Island Nuclear Generating Plant

Location: 1717 Wakonade Dr. East  
Welch, MN 55089

Inspection Dates: July 20 - 24, 1998

Inspectors: R. Jickling, Emergency Preparedness Analyst  
J. Foster, Senior Emergency Preparedness Analyst  
D. Funk, Emergency Preparedness Analyst  
R. Glinski, Radiation Specialist

Approved by: J. Creed, Chief, Plant Support Branch 1  
Division of Reactor Safety

## EXECUTIVE SUMMARY

Prairie Island Nuclear Generating Plant  
NRC Inspection Reports 50-282/98012; 50-306/98012

This inspection consisted of evaluation of the licensee's performance during the plant's biennial exercise of the Emergency Plan. It was conducted by regional emergency preparedness inspectors. No violations of NRC requirements were identified.

### Plant Support

- Overall performance during the 1998 Emergency Preparedness exercise was effective and demonstrated that emergency plan implementation activities met regulatory requirements. (Section P4.1.c)
- Overall performance in the Control Room Simulator was effective. Facility briefings were informative. Good communications and teamwork were evident. (Section P4.1.c)
- The Technical Support Center staff's performance was effective. Briefings and status board maintenance were competent. The emergency action level logic diagrams were proactively reviewed. Extensive decision-making and event mitigation activities were observed. (Section P4.1.c)
- The Operational Support Center's staff performed well in coordinating activities and maintaining control and status of the inplant response teams. Communications with the response teams and other emergency response facilities were performed well. (Section P4.1.c)
- Overall performance of Emergency Operations Facility staff was competent. Communications to onsite emergency response facilities and offsite agencies were frequent, and offsite notifications were timely. (Section P4.1.c)
- Self-critiques following termination of the exercise were thorough, self-critical, and included inputs from exercise participants as well as controllers. (Section P4.1.c)

## Report Details

### **IV. Plant Support**

#### **P3 Emergency Preparedness Procedures and Documentation**

##### **P3.1 Review of Exercise Objectives and Scenario (82302)**

The inspectors reviewed the 1998 exercise objectives and scenario and determined that they acceptably exercised major elements of the licensee's onsite emergency plan. The scenario provided a challenging framework to support demonstration of the licensee's capabilities to implement its emergency plan as indicated in Section P4.1.b.5. The scenario included a radiological release, multiple Alert events, and several equipment failures.

#### **P4 Staff Knowledge and Performance in Emergency Preparedness**

##### **P4.1 1998 Evaluated Biennial Emergency Preparedness Exercise**

###### **a. Inspection Scope (82301)**

On July 22, 1998, the licensee conducted a biennial exercise involving full participation by the states of Minnesota and Wisconsin, the counties of Dakota, Goodhue, and Pierce, and the city of Redwing. This exercise was conducted to test major portions of the licensee's onsite and offsite emergency response capabilities. Onsite and offsite emergency response organizations and emergency response facilities were activated. The NRC participated fully at the Regional offices in Lisle, Illinois, at the Prairie Island site, and at the NRC offices in Rockville, Maryland.

The inspectors evaluated performance in the following emergency response facilities:

- Control Room Simulator (CRS)
- Technical Support Center (TSC)
- Operations Support Center (OSC)
- Emergency Operations Facility (EOF)

The inspectors assessed the licensee's recognition of abnormal plant conditions, classification of emergency conditions, notification of offsite agencies, development of protective action recommendations, command-and-control, the transfer of emergency responsibilities between facilities, communications, and the overall implementation of the emergency plan. In addition, the inspectors attended the post-exercise critiques in each of the above facilities, with the exception of the CRS, to evaluate the licensee's initial self-assessment of exercise performance.

b. Emergency Response Facility Observations and Findings

b.1 Control Room Simulator (CRS)

Overall control room simulator personnel performance was effective. The Emergency Director's (ED's) command-and-control of the control room simulator crew was appropriate. Frequent briefings were informative and appropriately timed so as not to impact response to the emergency or plant conditions. Changing plant conditions and emergency status were included in the briefings as appropriate. The ED and crew displayed good awareness of plant and emergency conditions.

Emergency classifications and offsite notifications for the Alert declaration were correct and made in a timely manner. Initial offsite notifications to the States and counties were made within 15 minutes and NRC notifications were initiated approximately 20 minutes after the Alert declaration, well within the 60-minute requirement. CRS communications were efficient, and good crew teamwork was observed by the inspectors.

Control of changing plant conditions, coordination of the plant's emergency response, and performance of initial emergency responsibilities were appropriately demonstrated by the ED, Unit 1 Shift Supervisor (SS), and Unit 2 SS. The ED and SS's frequently assisted each other during their response to the simulated emergency.

b.2 Technical Support Center (TSC)

Overall performance in the TSC was effective. Event classification, briefings, and event mitigation efforts were all well done in the facility. The TSC was rapidly and efficiently activated following the declaration of the Alert. The facility was declared fully operational within nineteen minutes of the Alert declaration. A formal public address announcement was made when the ED assumed his responsibilities. The Emergency Response Data System (ERDS) was properly initiated during facility activation. A telephone call to the NRC verified that they were receiving ERDS data.

Briefings and status board maintenance were competent. Initial briefings defined plant status and provided guidance to the TSC staff on priorities. Periodic briefings were informative and concise and kept TSC personnel well-informed as to current status, priorities, and concerns. Both the event status and emergency work status board keepers participated in the update briefings which improved the staff's understanding of reactor status and inplant team status. Several times during the exercise TSC personnel would make brief announcements about late-breaking events or changes.

Status boards were detailed and well-maintained throughout the exercise. The "Emergency Work" status board, displaying inplant response team tasks, task priority, and comments, was extremely well-maintained. No status board problems were observed.

The Emergency Action Levels (EALs) were reviewed during facility activation to ensure that the current event classification was correct. Possible events which could lead to higher classifications were noted and discussed among the staff in a proactive manner. Priorities were established for the TSC staff, OSC teams, and properly adjusted as scenario conditions changed. These priorities were rapidly communicated to the CRS and OSC. Also, facility personnel TSC staff properly determined that plant conditions met the criteria for declaration of a Site Area Emergency, and passed their determination to the facility that was currently responsible for emergency classifications. TSC staff appropriately reviewed and discussed the criteria in the EAL logic diagrams and fission product barrier matrix numerous times during the exercise.

Technically sound TSC decision-making was demonstrated by delaying reentry into the area until radiation levels had decreased following the damaged fuel bundle in the spent fuel pool area. Another decision was made to begin reducing reactor power and shut down the reactor when plant conditions (loose parts monitor alarm, increasing reactor coolant system activity, and coolant leak) indicated signs of degradation. Further discussions identified that shutting down the reactor coolant pumps and cooling down by natural circulation might preclude further reactor coolant system damage from loose parts in the coolant system.

The ED ensured plant personnel safety when he ordered a plant evacuation following a hydrazine spill. Accountability of site personnel was conducted and completed within the required thirty minutes. TSC personnel promptly carded into the available accountability card reader with little distraction to ongoing efforts. Facility habitability was verified by the installed area radiation monitoring system and periodic surveys conducted by a radiation protection technician.

Extensive event mitigation activities were observed in the TSC. Electrical engineering staff determined that electrical bus 16 could be separated by sawing the bus apart in its cubicle, isolating a fault. A detailed procedure was developed to accomplish the bus separation. An alternate cooldown path for the residual heat removal system was developed and reviewed. When activities to terminate the release were unsuccessful, a snorkel truck from an offsite fire department was requested to respond to the site and spray the release vent to reduce the radioiodines. Detailed considerations were made for firetruck parking, water supply connection, as well as badging, providing dosimetry and escorting the firefighters. Planning discussions also included a setup to spray the vent while leaving the hoses unattended by plant personnel.

### b.3 Operational Support Center (OSC)

Overall, the OSC staff performed well in coordinating activities within the plant and properly maintained control and status of in-plant response teams. After the declaration of the Alert, the staff activated the OSC in an efficient and timely manner. The plant staff ensured that they were logged onto the personnel availability status board. This status board clearly indicated when sufficient staffing with appropriate expertise was available in the OSC. A radiation protection specialist (RPS) promptly initiated the OSC habitability surveys, which consisted of monitoring for dose rates, airborne radioactivity, and contamination. The OSC habitability was verified soon after OSC operation was declared and maintained throughout the simulated emergency.



Communications with the CRS, EOF, and the TSC were performed well, and the exchange of information aided the OSC coordinators in assembling, briefing, and coordinating the response teams. The Personnel Status, the Team Status, and the Plant Status boards were legible and updated periodically. The OSC supervisors assembled and briefed OSC repair teams on their tasks and radiological conditions. The Team Status board was kept current for the onsite teams and appropriately tracked the personnel involved, team tasks, task priority, and time of dispatch.

The OSC Coordinator and technical supervisors exhibited good teamwork regarding OSC teams to ensure appropriate expertise and radiation protection was provided. The OSC Coordinator also demonstrated proper command-and-control. The facility briefings were clear, concise, and frequent. The OSC personnel located in the Operations lounge area (used for overflow to minimize congestion in the OSC) were able to hear the briefings through a speaker system.

The RPS staff continuously monitored the Emergency Response Computer System (ERCS) to track radiological conditions throughout the plant. This ERCS information was actively used to assist in maintaining the site radiological map utilized to brief teams on radiological conditions.

The inspector noted good teamwork between the maintenance personnel and RPS during the attempt to close the safety relief valve. The RPS moved the team to a low dose area in response to a frisker alarm, conducted radiological surveys prior to allowing the workers in the Loop A main steam safety valve header area, and requested further guidance from the OSC after identifying that the safety valve dose rates had changed significantly. The maintenance crew was knowledgeable of the protective equipment requirements, the radiological conditions, and the tools needed to close the safety valve. Upon returning to the work area with the proper tools, the RPS correctly selected a lower dose rate route to keep with As-Low-As-Reasonably-Achievable (ALARA) radiation practices.

The OSC dispatched teams to collect containment atmosphere and reactor coolant samples from the post accident sampling station (PASS) when requested by the TSC. The radiological conditions were confirmed by OSC staff prior to dispatch and the chemistry team utilized appropriate radiation instruments to monitor auxiliary building and chemistry sample dose rates. The team simulated the collection and analysis of the PASS samples in accordance with a procedural checklist, and the PASS results were reported within the required time limit of three hours.

The OSC teams proficiently used radios to communicate with the OSC. The OSC staff properly evaluated tasks to determine the need for respiratory protection. The staff appropriately issued self-contained breathing apparatus (SCBAs) in response to the simulated Unit 2 turbine building hydrazine spill and the turbine building roof team. The OSC ensured the staff were respirator-qualified. The inspectors observed good control of the OSC repair teams when two individuals were replaced from the turbine building roof team because their respirator qualification was not current.

#### b.4 Emergency Operations Facility (EOF)

The overall performance in the EOF was competent. The facility was promptly staffed and then assumed responsibility for offsite emergency response well within one hour of the Alert declaration. Security and radiation protection personnel appropriately established access control to the facility and handed out appropriate dosimetry, TLDs and Self-Reading Dosimeters to EOF personnel.

The EOF staff worked well as a team. The Emergency Manager (EM) frequently communicated with the ED in the TSC and provided status updates to his staff when appropriate. However, not all personnel were attentive to the briefings, as conversations, both telephone and group discussions frequently continued. The technical support staff provided constructive support by reviewing current plant conditions, emergency action level status, and potential upgrades to the emergency classifications with possible degradations to the emergency, and by communicating with the facility personnel.

Both the Site Area Emergency and General Emergency (GE) were correctly classified and declared in a timely manner. Prior to the declaration of the GE, the EOF staff proactively reviewed nearsite special populations for precautionary recommended actions. The decision was made to recommend an evacuation of the Treasure Island Hotel and Casino after the Site Area Emergency.

The licensee's preparation for the arrival of the NRC Site Team was competent. The EOF Coordinator directed the effort to establish a briefing and administrative work area, obtain briefing forms, and ensure proper dosimetry was ready for issuance. The initial NRC site team briefing was coordinated well and provided plant conditions and described the NRC work areas in the facility.

The inspectors observed some minor perturbations in the ERDS connection. The licensee's computer operator inadvertently stopped and re-started the connection before realizing the computer connection had been re-established after an earlier disconnection.

The radiation protection staff continuously monitored meteorological conditions, provided frequent dose projections, and kept the EOF staff and supervisors well-informed of all radiological concerns in the plant. Dose assessors provided the EM with periodic dose projections which were used for the offsite notifications process.

b.5 Scenario and Exercise Control

The inspectors assessed the challenge of the scenario and evaluated the licensee's control of the exercise. The scenario was challenging as indicated in Section P3.1 of this report, and exercised the majority of the licensee's emergency response capabilities. The scenario was appropriate to test basic emergency capabilities and to demonstrate the licensee's exercise objectives.

No significant controller-prompting or exercise control problems were identified. Overall control of the exercise was appropriate.

b.6 Licensee Self-Critiques

The inspectors attended the licensee's self-critiques in the TSC, OSC, and EOF which occurred after the exercise. Exercise controllers solicited inputs from the participants in addition to providing the participants with the controllers' initial assessments of personnel performance. The inspectors concluded that these initial self-critiques were thorough and in close agreement with the majority of inspectors' observations.

c. Overall Conclusions

The exercise was a competent demonstration of the licensee's capabilities to implement its emergency plans and procedures.

- Overall performance during the 1998 Emergency Preparedness exercise was effective and demonstrated that emergency plan implementation activities met regulatory requirements. (Section P4.1.b)
- Overall performance in the Control Room Simulator was effective. Facility briefings were informative. Good communications and teamwork were evident. (Section P4.1.b.1)
- The Technical Support Center staff's performance was effective. Briefings and status board maintenance were competent. The emergency action level logic diagrams were proactively reviewed. Extensive decision-making and event mitigation activities were observed. (Section P4.1.b.2)
- The Operational Support Center's staff performed well in coordinating activities and maintaining control and status of the inplant response teams. Communications with the response teams and other emergency response facilities were performed well. (Section P4.1.b.3)
- Overall performance of Emergency Operations Facility staff was competent. Communications to onsite emergency response facilities and offsite agencies were frequent and offsite notifications were timely. (Section P4.1.b.4)
- Self-critiques following termination of the exercise were critical and included inputs from controllers and exercise participants. (Section P4.1.b.6)

## **P8 Miscellaneous EP Issues**

(Closed Inspection Followup Item 50-282/96006-09(DRP); 50-306/96006-09(DRP)):

During the 1996 exercise an IFI was identified for the inability of the OSC Coordinator to ascertain the status of emergency response teams. The emergency work status board did not always include needed information including task descriptions and the status of ongoing and completed emergency work. During the 1998 exercise, the emergency work status boards were appropriately updated with information regarding task descriptions and status of emergency work. This item is closed.

(Closed Inspection Followup Item 50-282/96006-10(DRP); 50-306/96006-10(DRP)):

During the 1996 exercise an IFI was identified for the failure of the EOF communicators to transmit a protective action recommendation change notification to required locations. During the 1998 exercise the protective action recommendation change notifications were appropriately transmitted to the offsite agencies. This item is closed.

(Closed Inspection Followup Item 50-282/96006-11(DRP); 50-306/96006-11(DRP)):

During the 1996 exercise, the EOF staff did not recognize that the emergency action level (EAL) for the General Emergency classification was met without needing a safety injection to occur. The EAL format had been revised to include the whole EAL on one page, and this issue was included in EP training. During the 1998 exercise the Technical Support group in the EOF provided appropriate EAL recommendations to the Emergency Manager in a timely manner. This item is closed.

## **V. Management Meetings**

### **X.1 Exit Meeting Summary**

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on July 24, 1998. The licensee acknowledged the findings presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

## **PARTIAL LIST OF PERSONS CONTACTED**

### **Licensee**

M. Agen, Emergency Plan Sr. Nuclear Consultant  
T. Amundson, General Superintendent Engineering  
D. Anderson, Project Manager Engineer  
T. Borgen, Operations Shift Supervisor  
G. Dammann, Operations Shift Supervisor  
S. Derleth, Radioactive Waste Shipping Coordinator  
L. Finholm, Emergency Plan Sr. Technical Instructor  
J. Friedrich, Radiation Protection Engineer  
G. Gore, Superintendent Mechanical/Civil Engineering  
A. Johnson, Radiation Protection Supervisor  
M. Johnson, Sr. Nuclear Consultant  
M. Ladd, Training Process Manager  
R. Lindsey, General Superintendent Safety Assessment  
B. Mather, Operations Shift Manager  
G. Melinowski, Radiation Protection Supervisor  
J. Payton, Sr. Technical Instructor  
M. Pfeffer, Emergency Plan Technical Instructor  
D. Reynolds, Project Manager  
S. Rogers, Operations Shift Supervisor  
D. Schuelke, General Superintendent Radiation Protection and Chemistry  
R. Sloss, Nuclear Auditing Engineer  
M. Sleigh, Superintendent Security  
D. Smith, Operations Shift Manager  
J. Sorensen, Plant Manager  
D. Wesphal, Superintendent Operations Training

### **NRC**

P. Krohn, Resident Inspector  
S. Ray, Senior Resident Inspector  
S. Thomas, Resident Inspector

## **INSPECTION PROCEDURES USED**

IP 82301 Evaluation of Exercises for Power Reactors  
IP 82302 Review of Exercise Objectives and Scenarios for Power Reactors

## ITEMS CLOSED

### Closed

50-282;306/96006-09	IFI	Inability of the OSC Coordinator to ascertain the status of emergency response teams during the 1996 exercise.
50-282;306/96006-10	IFI	Failure of the EOF communicators to transmit a protective action recommendation change notification to required locations during the 1996 EP exercise.
50-282;306/96006-11	IFI	The EOF staff did not recognize that the emergency action level (EAL) for the General Emergency classification was met without needing a safety injection to occur during the 1996 EP exercise.

## LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
CFR	Code of Federal Regulations
CRS	Control Room Simulator
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
EAL	Emergency Action Level
ED	Emergency Director
EM	Emergency Manager
EP	Emergency Preparedness
EOF	Emergency Operations Facility
ERCS	Emergency Response Computer System
ERDS	Emergency Response Data System
ERF	Emergency Response Facilities
EP	Emergency Preparedness
ERO	Emergency Response Organization
GE	General Emergency
IFI	Inspection Follow-up Item
IP	Inspection Procedure
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
OSC	Operations Support Center
PAR	Protective Action Recommendation
PASS	Post Accident Sampling System
PDR	NRC Public Document Room
RPS	Radiation Protection Specialist
SCBA	Self Contained Breathing Apparatus
SS	Shift Supervisor
TSC	Technical Support Center