U.S. NUCLEAR REGULATORY COMMISSION

REGION 111

Report Nos. 50-282/92007(DRSS): 50-306/92007(DRSS)

Docket No. 50-282: 50-306

Licenses No. DPR-42; DPR-60

Licensee: Northern States Power Company

414 Nicollet Mall Minneapolis, MN 55401

Facility Name: Prairie Island Nuclear Generating Plant, Units 1 and 2

Inspection At: Prairie Island Site, Red Wing, Minnesota

Inspection Conducted: March 30 - April 3, 1992

Inspectors: S. K. Orth

Approved By: J. W. McCormick-Barger, Chief Roy Emergency Preparedness Section 4/22/92 Date

4/22/92

Inspection Summary

Inspection on March 30 - April 3, 1992 (Report Nos. 50-282/92007(DRSS); 50-306/92007(DRSS))

Areas Inspected: Routine, announced inspection of the Prairie Island Nuclear Generating Plant's Emergency Preparedness (EP) program, including the following: review of actual emergency plan activations (IP 82701) and operational status of the EP program (IP 82701). The inspection involved two

Results: No violations or deviations were identified.

Proper classifications were made on the four emergency plan activations since October 1989. The times required for event classification and NRC notification during the February 1992 Unusual Event were marginally adequate. Procedures defining communicator assignments were revised to assure that notifications would be more timely.

Several enhancements have been made in the emergency response facilities. Public Alert and Notification System's operability has been improved in response to recent siren equipment failures. The staffing of the Emergency Response Organization (ERO) remains good. Positions in the Emergency

Operations Facility (EOF) formerly held by corporate personnel have been reassigned to site personnel to expedite its activation. The EP training program continues to be very well maintained.

Several minor inaccuracies were identified during a review of plant safety procedures. These inaccuracies were being addressed by the licensee at the end of the inspection.

DETAILS

1. Persons Contacted

E. Watzl, Site General Manager

M. Sellman, Flant Manager

D. Martin, Administrator, Corporate Emergency Planning M. Agen, Lead Production Engineer, Emergency Planning

L. Brehm, Quality Assurance

J. McDonald, Supervisor, Site Quality Assurance

The above licensee representatives attended the April 3, 1992 exit interview.

The inspectors also contacted other licensee personnel during the inspection.

2. Actual Emergency Plan Activations (IP 82701)

Licensee and NRC records of emergency plan activations since October 1989 were reviewed.

On August 23, 1990, an Unusual Event was declared in a correct and timely manner following the loss of some Control Room annunciators for Unit 1. State, county and NRC officials were initially notified of this emergency declaration in a timely and adequately detailed manner.

On October 17, 1990, an Unusual Event was declared for a suspected earthquake following an alarm on the onsite seismic monitoring equipment. Preliminary analysis of film from the seismic monitoring equipment's recorder indicated that an earthquake had been measured; however, there were no other indications of an earthquake. A conservative decision was made to declare an Unusual Event while walkdowns of onsite equipment were conducted and the National Earthquake Information Center (NEIC) in Colorado was contacted. The Unusual Event was terminated after the following had occurred: further analysis of the seismic monitoring equipment indicated that it had falsely alarmed; plant walkdowns indicated no damage to structures or equipment; and the NEIC reported no evidence of an earthquake within the nation during the time period in question.

On May 14, 1991, an Unusual Event was declared in a correct and timely manner following the loss of some Control Room annunciators for Unit 1. State, county and NRC officials were initially notified in a timely and adequately detailed manner.

The licensee declared an Unusual Event on February 21, 1992, due to loss of shutdown cooling while in the early stages of a refueling outage for Unit 2. The following paragraphs summarize the event, the associated emergency plan activation, corrective actions initiated by the licensee and the inspectors' assessments. The NRC's evaluation of other onsite activities associated with the February 21, 1992 Unusual Event declaration is documented in Augmented Inspection Team (AIT) Report No. 50-306/92005.

At 11:11 p.m. on February 20, 1992, the 22 Residual Heat Removal (RHR) pump was stopped by Control Room personnel due to cavitation while draining the Reactor Coolant System (RCS) to the coolant loop centerline. At 11:13 p.m., the 21 charging pump was started to add water to the reactor vessel. At 11:26 p.m., RCS thermocouples indicated that the RCS temperature exceeded 200 degrees Fahrenheit (F). By 11:32 p.m., onshift personnel had aligned the 21 RHR pump to the Refuel Water Storage Tank (RWST) and started the 21 RHR pump. At 11:34 p.m., thermocouples indicated that the RCS temperature had been reduced below 200 degrees F and RCS level was restored to about 1.5 inches above the reactor vessel's flange.

At 00:25 a.m. on February 21, 1992, the Shift Manager declared an Unusual Event after a review of potentially relevant Emergency Action Levels (EALs) found in Emergency Plan Implementing Procedure (EPIP) F3-2, "Classifications of Emergencies". State and county officials were initially notified of the emergency declaration within the 15 minute regulatory time limit; however, the NRC's Headquarters Operations Officer was not initially notified until a marginally acceptable 61 minutes after the Unusual Event declaration. Although the NRC was given a detailed chronological description of conditions associated with the emergency declaration, the initial event description given to State and county officials was inadequately detailed.

The emergency classification guidance, contained in the revision of EPIP F3-2 in effect on February 20-21, 1992, did not contain sufficiently clear guidance to determine whether and when an Alert declaration was appropriate. The lack of clear procedural guidance resulted in a relatively untimely Unusual Event declaration.

Condition 12 EALs relate to plant shutdown functions. While in a cold shutdown condition, an Alert declaration would have been warranted for the "complete loss" of any function needed to maintain cold shutdown, as indicated by either of the following: inoperability of the RHR system and RCS temperature above 200 degrees F; or the Site Manager's (SM's) opinion that functions required to maintain cold shutdown were not available. The SM concluded that neither of these indicators was met, since there was not a "complete loss" of the RHR system. The 21 RHR pump was considered to be available for core cooling, initially by lineup to the RWST and later in the formal shutdown cooling mode.

The Unusual Event declaration was based on the EAL for a plant condition that had occurred "which met a classification, but rapidly deescalated to current plant conditions which do not meet any classification". The plant condition, which was considered to have been met earlier, was generically stated in procedure F3-2 as "conditions that warrant increased awareness on the part of plant operations staff or state and/or local offsite authorities". Based on the procedural guidance in place on February 20-21, 1992, the Unusual Event declaration was adequate; however, it should have been declared sooner, such as shortly after RCS temperatures had decreased below 200 degrees F.

In response to concerns regarding the quality of the EALs associated with a loss of the capability to maintain cold shutdown, the licensee issued Temporary Memo 92-26 on February 22, 1992. This document revised the EALs as follows. An Unusual Event would be declared for a partial loss of the RHR system, as indicated by entry into procedure E-4, "core Cooling Following Loss of RHR Flow". An Alert would be declared if the following two conditions were satisfied: loss of core cooling, resulting in a RCS temperature exceeding 200 degrees f, and the SM's opinion the "lost function required to return to plant cold shutdown is not available". Although the Unusual Event EAL provided straightforward guidance for that emergency declaration, the revised wording of the Alert EAL was not considered optimally objective by the licensee. Subsequently, the inspectors discussed with the licensee another draft revision to the cold shutdown EALs.

Per 10 CFR 50.72 (a)(3), a power reactor licensee is required to initially notify the NRC of any emergency declaration "immediately afte notification of the appropriate State or local agencies and not later than one hour after the time the licensee declares one of the emergency classes". On February 21, 1992 the licensee did not initially notify the NFC Headquarters Operations Officer until a marginally acceptable 61 minutes after the Unusual Event declaration. The licensee's thorough evaluation of its EP-related actions indicated that procedural guidance was unclear regarding whether the Shift Emergency Communicator (SEC). who is onsite for a 24-hour consecutive period, was responsible for initially notifying NRC of any emergency plan activation in addition to other clearly assigned duties. This lack of procedural direction delayed the initial notification of the NRC. Following the event, records indicated that appropriate EPIPs, associated message forms and Administrative Control Directive 5ACD 3.6 were adequately revised to clearly indicate that the SEC will not be tasked with initially notifying the NRC Headquarters Operations Officer of any emergency declaration. The revisions specified that the SM and Shift Supervisor were currently responsible for ensuring that the NRC is initially notified by a knowledgeable individual in the Control Room,

Records review indicated that State and county officials were given an inadequately detailed description of the reasor for the Unusual Event declaration of February 21, 1992. The initial message indicated that a plant event had occurred which met an emergency classification; however, the situation had rapidly deescalated to current plant conditions which did not meet any emergency classification criterion. The physical event which led to the emergency declaration was not described. The licensee's evaluation, which included interviews with Minnesota and Wisconsin officials, correctly identified the need for the SEC to provide a more detailed event descr. ion for such "pass through" emergency declarations. Records indicated that applicable EPIPs, regarding notifications to State and local agencies, had been revised to better ensure that these agencies will be given an adequately detailed event description during the initial notification and/or the first periodic followup message.

No violations or deviations were identified.

3. Operational Status of the Emergency Preparedness Program (1P 82701)

a. Emergency Plan and Implementing Procedures

Current copies of the Emergency Plan and Emergency Plan Implementing Procedures (SPIPs) were maintained and readily available in the Emergency Response Facilities (ERFs) and the Control Room (CR).

The inspectors reviewed procedures F5-9 "Personnel Accountability" and F3-10 "Emergency Evacuation". As outlined in the procedures, accountability would be attained via plant evacuation. At an Alert, Site Area Emergency, or General Emergency, plant personnel would be directed by a plant public address announcement to exit the security guard house and proceed to the designated assembly point outside of the protected area. As personnel exit, security personnel would collect identification badges and insert them into security card readers to determine accountability. Card readers would have been already activated in the Technical Support Center (TSC) to account for TSC staff. Anditionally, security would perform tours of the owner controlled areas to ensure that personnel outside of the protected area would also proceed to the assembly points for further instructions. Assembly point coordinators, assigned to assembly areas, were required to segregate possibly contaminated persons, perform decontamination procedures, and aid security if additional information is needed for accountability. The assembly point coordinators would be notified by the Emergency Director as to whether an owner controlled evacuation would be implemented or whether some personnel would be needed to augment TSC or OSC staffs. These procedures adequately address concern for personnel both in the protected area and outside of the protected area in the owner controlled area.

Selected changes to the EPIPs were reviewed. Procedure F3-6, "Activation and Operation of the TSC", was revised in January 1992 to indicate that the TSC workspace also included a portion of the second floor of the old administration building's annex, which was within the TSC's emergency ventilation system's envelope. The procedure indicated that the location of the TSC's contamination control point had been revised due to this TSC workspace expansion. Procedure F3-7, "Activation and Operation of the OSC", was revised to include guidance for OSC relocation in the event that specific abnormal radiological conditions existed in the OSC.

Several Plant Safety Procedures were reviewed with respect to their emergency preparedness aspects. Procedure F4, "Medical Support and Casualty Care", would be implemented in the event of an onsite injury which may or may not involve contamination of the victim(s). This procedure clearly indicated which personnel were responsible for the following response functions: onscene medical care by qualified plant personnel; onscene coordination with Control Room and security force personnel; expediting site access for offsite medical support personnel; emergency classification,

if a victim was contaminated and required transport to an offsite medical facility; and initial notifications to State, county and NRC officials if a contaminated/injured victim was transported to an offsite medical facility. The procedure also listed primary and packup hospitals and ambulance services, which were verified with the licensee's letters of agreement with offsite support organizations.

Revision 16 of plant safety procedure F5, "Fire Fighting", was reviewed. It clearly indicated which personnel were responsible for emergency classification, offsite agencies' notifications and activation of the onsire emergency organization. However, revision 16 was found to have several inaccurate statements. The main body of the procedure correctly indicated that the Unit 1 Assistant Plant Equipment Operator (APEO) would be the onshift fire brigade chief, but Appendix 8 to the procedure incorrectly stated that the Unit 2 Shift Supervisor would be the fire brigade chisf in the event of a Control Room evacuation due to a fire. Appendix B also contained several incorrect "assumptions" regarding the activation of the emergency plan following a firerelated, Control Room evacuation. The procedure indicated that onshift personnel should assume that the TSC and OSC would become staffed within two hours, while the emergency plan indicated that these facilities would become staffed within about one hour. Appendix B also contained an incorrect assumption that a Control Room evacuation warranted only an Alert declaration. The licensee's approved EALs indicated that an Alert declaration was appropriate if onshift personnel could regain control of reactor operations within 15 minutes of a Control Room evacuation; however, if control would take longer to reestablish, a Site Area Emergency declaration was warranted.

The licensee's actions to revise Plant Safety Procedure F5 to correct inaccuracies regarding the identity of the fire brigade chief, the appropriate emergency classification for a Control Room evacuation and the timeliness of TSC and CSC staffing will be tracked as an Open Item (50-282/92007-01 and 50-306/92007-01).

No violations or deviations were identified; however, one Open Item was identifies.

b. Emergency Response Facilities (ERFs), Equipment, Instrumentation and Supplies

A tour was conducted through the Technical Support Center (TSC), Operational Support Center (OSC), Emergency Operations Facility (EOF), Assembly Points, Offsite Monitoring Vehicles, and the Control Room (CR). The facilities were as described in the Emergency Plan. An inspector also toured the Headquarters Emergency Center (HQEC), which was recently relocated within downtown Minneapolis, Minne ota.

Several enhancements have been added to the facilities since the previous inspection. A major remodeling project was completed in the EOF which resulted in a larger central working space. This was a great improvement from the former EOF layout. The ISC was expanded to include the floor above the previously designated ISC area. Both floors were contained in the same ventilation envelope. There have also been notable noise reduction design changes made to the ISC, including new carpeting with added padding, added ventilation system vents to reduce noise from high air velocities, and other engineered features. Remodeling was also completed in the OSC. Storage cabinets were relocated from the center of the OSC to the perimeter. This modification should make the layout less intrusive to OSC personnel. These facility enhancements should increase the response abilities of persons functioning within these facilities.

The MQEC was the Backup EUF (BEDF) for the Primie Island and Monticello Nuclear Generating Plants in the event that the affected plant's nearsite EDF would be evacuated. By letter dated February 14, 1992, the licensee notified the NRC and the Federal Emergency Management Agency (FEMA) that the HQEC would be relocated on February 20, 1992. The facility was moved to the Renaissance Square building, which was about one-half mile from the HQEC's previous location in the International Centre building in downtown Minneapolis. Movement of the HQEC was necessitated by the expiration of the licensee's lease at the International Centre building.

Records indicated that Minnesota and Wisconsin officials were aware of and had no objection to the HQEC's relocation. The licensee informed holders of its emergency telephone directory of the relocation and planned to describe the new HQEC in the 1992 revision to the Corporate Emergency Plan.

An inspector toured the HQEC, which was a dedicated workspace of approximately 1400 square feet on the tenth floor of the Renaissance Square building. The HQEC was in an operational state of readiness. It was equipped with a Meteorological Information and Dose Assessment System (MIDAS) computer terminal for acquiring either plant's posite meteorological data and for performing offsite dose calculations. Other computer terminals were linked to each plant's Safety Parameter Display System (SPDS). Status boards and Emergency Planning Zone (EPZ) maps were wall-mounted or otherwise readily available. Onsite and offsite emergency plans and other appropriate reference documents were stored in the HQEC and were maintained by corporate staff.

Good numbers of telephones, including six for NRC Site Team representatives, and two telecopier machines were operable in the HQEC. Communications equipment was also installed to allow HQEC staff to monitor, but not to direct, the activities of the licensee's offsite radiological survey teams. Work stations were well organized for the following functions: management; reactor safety; protective measures; public information; and administrative support.

The ERFs have been maintained in a very good state of operational readiness. Records indicated that all supply inventories and communications equipment tests were completed in accordance with procedural requirements. Corrective actions were taken as needed on any problems identified during these activities.

The TSC and EOF were equipped with emergency ventilation systems and Continuous Air Monitors (CAMs). The TSC was also equipped with a permanent Area Radiation Monitor (ARM). Records indicated that the TSC's ventilation system had undergone semi-annual operability tests since the last inspection, while the EOF's ventilation system had undergone quarterly operational tests and annual inspections and testing of its high efficiency particulate filters. Both facilities' CAMs and the TSC's ARM had been functionally tested and calibrated per procedural requirements. However, the particulate monitoring component of the TSC's CAM was out of service for maintenance during this inspection.

Records also indicated that periodic calibrations and more frequent surveillances of the onsite meteorological monitoring systems were completed per procedural requirements.

The inspectors also reviewed the status of the licensee's Public Alert and Notification System (PANS) with members of the Corporate Emergency Preparedness Staff. The operability of the sirens had been assessed through the use of Light Verification Units (LVUs). As an indication that the siren had functioned, the LVU illuminated when a siren received electrical power and made an audible response. These units were to remain illuminated for three days following a siren test. After a test, the vendor conducted a visual survey and recorded which LVUs were illuminated. Reports from the public and plant personnel in December 1991 and January 1992 indicated that some of the LVU, remained on for extended periods of duration and, likely, into the rext testing cycle. Testing of new sirens to be added to the PANS system also reconfirmed the LVU concerns.

The licensee began extensive testing of the PANS system in February and March of 1992. During the Narch 1992 test, each siren in the Emergency Planning Zone was observed by site personnel. Twelve out of 74 sirens were not functional during this test, and 20 percent of the LVUs failed to operate correctly. Accordingly, corrective maintenance was completed on the malfunctioning sirens following the test. The vendor also developed a new LVU design which should have eliminated the electronic problems in the aging LVUs.

Prior to replacing all of the remaining old LVUs, the licensee has begun surveillances to investigate the reliability of the new LVU design. In the interim, the licensee has conducted verifications prior to siren testing, ensuring that the LVUs are not pre-illuminated before a test. They had also taken responsibility from the verdor for conducting the siren tour following an initiation. They have positioned plant personnel at siren stations which the LVUs indicated were ineperable but did not

appear to require mechanical adjustments. This action was taken to better determine the cause of the failure. Through these changes, the licensee should be better able to verify and maintain siren operability and detect vandalism at siren stations. These corrective actions were aggressively pursued and should deter further problems.

No violations or deviations were identified.

c. Organization and Management Control

The inspectors reviewed the station's organizational structure with the Emergency Planning (EP) Coordinator. The overall organization and control of the Emergency Preparedness function had not changed since the last report. The Lead Production Engineer (EP Coordinator) reported to the General Superintendent of Radiation Protection and Chemistry, who reported directly to the Plant Manager. The Plant Manager remained functionally responsible to the Station Manager. This management structure was effective in gaining support for the Emergency Planning program.

The EP Coordinator was assigned exclusively Emergency Preparedness duties. The EP Coordinator was very experienced, having occupied this position for three years. Prior to this position, the EP Coordinator was responsible for training of the Emergency plan, both at the corporate center and at the Prairie Island site. The EP Coordinator was assisted by a Senior Radiation Protection Specialist whose responsibilities were primarily EP duties with the exception of Radiation Protection duties during outages.

The inspectors reviewed the licensee's EP tracking system. This system consisted of the major items tracked by the corporate tracking system and items of minor concern which the EP Coordinator identified through drill and exercise critiques, training evaluations, audits. NRC inspections, and other Emergency Plan activities. This redundancy ensured that the proper attention was given to these concerns. The EP Coordinator prepared for his supervisor a quarterly status update of the outstanding items. Items in this tracking system appeared to be adequately resolved within an appropriate amount of time.

The Emergency Response Organization (ERO) remained staffed by at least four persons in each support and supervisory position. Since the last report, the staffing of the Emergency Operations facility (EOF) had been revised to require that the plant's staff occupy all EOF positions. Prior to this revision, the EOF's supervisory positions were filled by personnel from the corporate office in Minneapolis, Minnesota. This enhancement was expected to expedite the activation of this facility. Since other onsite staffed facilities, i.e. the Technical Support Center and the Operational Support Center, are activated in one hour or less, the licensee agreed to re-evaluate the two hour EOF activation goal to reflect the above staffing change.

The augmentation list for the ERO was updated quarterly by the EP Coordinator. The training status of the ERO had been controlled through quarterly and monthly ERO training status memorandums from the training department to the EP Coordinator and the Plant Manager, respectively. The EP Coordinator updated the ERO roster based on the status of those individuals listed in these memorandums. This method was an effective tool in controlling the current ERO. The inspectors noted the excellent response that plant personnel gave to ERO training.

The inspectors reviewed the interfaces between the Prairie Island Plant staff, Prairie Island Training Center staff, and Northern States Power Corporate EP staff. Several committees and programs were developed to ensure that communications between these organizations were effective. These programs included the Programs Advisory Committee and the Emergency Plan Review Committee, which met on a quarterly and monthly basis, respectively, and reviewed EP concerns. The committees and additional programs provided very good interactions between the three staffs.

Letters of agreement with offsite support organizations were reviewed and were found to be current.

No violations or deviations were identified.

d. Training

The inspectors reviewed the onsite ERO's annual training program, including records of individuals' EP training, a sampling of lesson plans, and controls that were inply to ensure lesson plans were updated. Overall, the training program was very well maintained.

The inspectors reviewed a selection of lesson plans to assess their content and to ensure they were revised with Emergency Plan revisions. All lesson plans reviewed were consistent with the current revision of the Emergency Plan and EPIPs. The inspectors found the lesson plans to be appropriate in content for each position.

The inspectors reviewed the training department's program which ensured that lesson plans are reviewed subsequent to Emergency Plan revisions. After Emergency Plan revisions are made, a copy of the current revision is directed to the appropriate training supervisor for review. If the revision appears to have an effect on lesson plans, a Request for Training Material Review (RTMR) would be issued by the above determined training supervisor to the appropriate training staff. These RTMRs were tracked by the training department until the appropriate lesson plan change or revision had been completed. The training supervisor reviewed the outstanding RTMRs quarterly and was required to approve completed RTMRs. This method was a very good means of assuring lesson plans were updated in a timely manner.

The inspectors reviewed the training records of the ERO. A review of over 50 ERO members' records verified that all were current in training. The ERO training records were compared with the training matrix. The inspectors verified that all ERO positions received the required initial and continual training as specified in the ERO training matrix.

The inspectors conducted walkthroughs with two persons who were assigned to perform offsite dose calculations using MIDAS. Both persons adequately demonstrated their capabilities. An inspector also observed a training walkthrough in the EOF. The training was well corducted. Participants showed good interest and responsiveness to the instructions.

No violations or deviations were identified.

e. Independent Reviews/Audits

The inspectors reviewed audits conducted by the Quality Assurance (QA) staff during 1990, 1991 and 1992 which satisfied the annual requirements of 10 CFR 50.54(t). These audits included interviews with Minnesota and Wisconsin officials as part of the required assessment of the adequacy of the licensee's interface with offsite support organizations. The 1992 audit included several refinements. In response to recent concerns regarding the operational readiness of the EPZ's Public Alert and Notification System (PANS), the 1992 audit's scope was expanded to include aspects of the periodic testing of the PANS. The 1992 audit also included such "performance based" activities as the observation of several EP training sessions and an off-hours augmentation drill. The 1990 through 1992 audits' records were complete and indicated that appropriate followup had occurred on previously identified concerns.

In addition to the annual audits, QA staff conducted several surveillances of specific aspects of the licensee's EP program. For example, a surveillance was conducted on contract auditors' recommendations following their review of the interfaces between the plant's EP staff, corporate EP staff and training center staff involved in EP training. A 1990 surveillance addressed the maintenance, procedures and training on the post accident sampling system. A surveillance of the functions, staffing and equipment of the nearsite EOF and the HOEC was also conducted in late 1990.

No violations or deviations were identified.

4. Open Items

Open Items are matters which have been discussed with the licensee, which will be reviewed further by the inspectors, and which involve some action on the part of the NRC or licensee, or both. An open item identified during the inspection is discussed in Section 3.a.

5. Exit Interview

On April 3, 1992, the inspectors met with those licensee representatives identified in Paragraph 1 to present and discuss the preliminary inspection findings. The licensee indicated that none of the items discussed were proprietary in nature.

The inspectors discussed the areas of inspection with the licensee's management. The inspectors noted the appropriate corrective actions resulting from the February 1992 Unusual Event. The licensee revised the procedures for offsite agency notifications to improve the timeliness and quality of notifications.

The inspectors also reviewed plant safety procedures. Minor inaccuracies were found in procedure F5, "Fire Fighting", including assignment of the position of fire brigade chief and assumptions related to the activation time of the TSC. The licensee was taking action to address these issues at the end of the inspection.

The inspectors discussed the several modifications made to the emergency response facilities. The inspectors commented on the aggressive actions taken to pursue operability problems associated with the Public Alert and Notification System. The very good training and staffing of the Emergency Response Organization was also noted.