

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

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SUBJECT: MONTICELLO INSPECTION REPORT 50-263/99009(DRP)

Dear Mr. Wadley:

On February 3, 2000, the NRC completed an inspection at the Monticello reactor facility. The enclosed report presents the results of that inspection.

During the 7-week period covered by this inspection, activities at the Monticello facility were characterized by good conduct of operations and maintenance. However, two significant examples of a breakdown in maintaining a questioning attitude were identified. The failure of the operations committee to identify an inappropriate change to an emergency operating procedure and a near-miss tagging event highlight the need to continue your ongoing efforts to instill a questioning attitude in the plant staff.

Based on the results of this inspection, the NRC has determined that a violation of NRC requirements occurred. This violation is being treated as a Non-Cited Violation (NCV), consistent with Section VII.B.1.a of the Enforcement Policy. This NCV is described in the subject inspection report. If you contest the violation or severity level of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to the Regional Administrator, Region III, and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington DC 20555-0001.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if you choose to provide one, will be placed in the NRC Public Document Room.

Sincerely,

/s/ R. Lanksbury

Roger D. Lanksbury, Chief  
 Reactor Projects Branch 5

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

Enclosure: Inspection Report 50-263/99009(DRP)

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION III  
801 WARRENVILLE ROAD  
LISLE, ILLINOIS 60532-4351

February 16, 2000

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

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Sincerely,

A handwritten signature in black ink, appearing to read "RD Lanksbury", written over a horizontal line.

Roger D. Lanksbury, Chief  
Reactor Projects Branch 5

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License No. DPR-22

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M. Wadley

-2-

cc w/encl: Site General Manager, Monticello  
Plant Manager, Monticello  
S. Minn, Commissioner, Minnesota  
Department of Public Service

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 50-263/99009(DRP)

Licensee: Northern States Power Company

Facility: Monticello Nuclear Generating Station

Location: 2807 West Highway 75  
Monticello, MN 55362

Dates: December 17, 1999, through February 3, 2000

Inspectors: S. Burton, Senior Resident Inspector  
D. Wrona, Resident Inspector

Approved by: Roger D. Lanksbury, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

## EXECUTIVE SUMMARY

### Monticello Nuclear Generating Station NRC Inspection Report 50-263/99009(DRP)

This inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a 7-week period of resident inspection.

#### Operations

- Cold weather preparations were performed in accordance with instructions contained within approved procedures and were completed in a timely manner and without error. Provisions to ensure systems, such as heat tracing, remained operable and were adequate. (Section O1.2)
- Reactor shutdown and refueling activities were performed in accordance with instructions contained in approved procedures by qualified and well-trained operators. (Sections O1.3 and O1.4)
- Changes made to the "Secondary Containment Control" emergency operating procedure introduced non-conservatism and did not meet the intent of the safety evaluation performed by the engineering department. A non-cited violation was issued. Furthermore, a condition report was not generated when the engineering department became aware of the procedural inadequacy. (Section O1.5)

#### Maintenance

- Good communications skills, technician knowledge, use of three-part communication, self-checking, and engineering involvement were observed during maintenance activities. (Section M1.1)
- Inappropriate assumptions associated with maintenance on a motor-operated valve resulted in safety tags being removed prior to the completion of maintenance on the valve. This "near miss" safety tagging error was entered into the licensee's corrective action program for tracking and resolution. Aggressive immediate and followup corrective actions were initiated. (Section M1.2)
- The licensee demonstrated a good questioning attitude while resolving non-destructive examination issues associated with welds on sections of replaced residual heat removal service water system piping. (Section M1.3)

#### Engineering

- The licensee's methodology for performing residual heat removal heat exchanger efficiency tests did not provide adequate controls on the service water flow rate parameters established for conducting the test. The licensee corrected the deficiency and successfully confirmed the operability of the associated heat exchangers. (Section E1.1)

- The inspectors concluded that the licensee conservatively applied shutdown risk concepts during the planning and execution of the refueling outage. The implementation of the outage plan was conducted effectively and in a controlled manner. (Section E1.2)

## Report Details

### Summary of Plant Status

The inspection period began with the unit operating in coastdown. Coastdown to refueling began during the prior inspection period on November 12, 1999, when reactor power could no longer be maintained at 100 percent with all rods fully withdrawn and reactor recirculation flow at maximum. Power steadily decreased to 82.2 percent and a reactor shutdown was commenced at 1:40 p.m. on Wednesday, January 5, 2000. Reactor power was decreased steadily and the reactor was taken offline by insertion of a manual scram at 12:24 a.m. on January 6, 2000. Monticello commenced refueling outage 19 at 12:25 a.m. on January 6, 2000, when the turbine-generator was removed from service. The reactor remained shutdown and refueling continued throughout the remainder of the inspection period.

### I. Operations

#### **O1 Conduct of Operations**

##### **O1.1 Inspection Scope (71707)**

The inspectors observed various aspects of plant operations, including use of Technical Specifications (TSs), plant procedures, the Updated Safety Analysis Report (USAR), communications, management oversight, proper system configuration and configuration control, operations management committee, and operator performance during routine plant operations and plant power changes. The inspectors performed a walkdown of portions of the residual heat removal (RHR) system. The inspectors also reviewed an event notification made per 10 Part 50.72 for a security issue and for the retraction of an event report made when a high pressure coolant injection (HPCI) pipe hanger was found degraded.

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

The conduct of operations was characterized by good procedural compliance, evaluations of risk for work activities, proper three-part communications, and safety-conscious performance. Evolutions such as surveillance tests and plant power changes were well-controlled, deliberate, and were performed in accordance with procedures. Shift turnover briefings were comprehensive and were typically attended by the plant manager and the general superintendent of operations. Material condition was good and minor discrepancies were brought to the attention of the licensee and corrected. Containment isolation valves were observed to be properly aligned. Specific events and noteworthy observations are detailed below.

- Minor housekeeping and operational deficiencies were brought to the attention of the licensee, promptly corrected, and applicable items entered into the corrective action program.
- During observations of maintenance activities described in Section M1.1 of this report, the inspectors observed numerous isolation tags. These tags were placed on the correct equipment. With one exception, identified in Section M1.2 of this report, associated safety tags were cleared and the equipment returned to the correct position when maintenance activities were completed.

- Pre-evolution briefings for various operations and maintenance activities were detailed. Contingency plans and past problems from the site or other stations were discussed. Plant management stressed communications, self-checking, and peer-checking.

## O1.2 Cold Weather Preparations

### a. Inspection Scope (71714)

The inspectors reviewed the licensee's cold weather preparations, which were performed in accordance with the instructions outlined in Procedure 1151, Revision 38, "Winter Checklist." Included in the review was a walkdown of related systems, verifications of procedural requirements associated with safety significant systems, interviews with operations personnel, and an in-plant walkdown of equipment that could potentially be affected by cold weather.

### b. Observations and Findings

The licensee demonstrated conservatism associated with changing environmental conditions during plan-of-the-day meetings and shift briefings. Licensee management instructed site personnel to consider environmental concerns during the planning and performance of maintenance during the winter season, to be aware of the impact of colder conditions on equipment performance, and emphasized the importance of ensuring that component heat tracing functioned properly.

The licensee used winter checklist tags on equipment to identify that the equipment was in an abnormal lineup due to winter layup. The inspectors questioned shift management to determine if the winter checklist tags were used to protect personnel or equipment. Shift management stated that the tags were only used for configuration control purposes to identify equipment that was in an abnormal position due to winter layup. The inspectors had no further concerns.

The inspectors reviewed the licensee's methodology for ensuring operability of heat trace systems that did not have indicating lights or meters that provided indication that the systems were functioning properly. The licensee had established periodic surveillance test procedures which required electrical maintenance personnel to perform testing to verify continued operation of safety significant heat trace systems.

### c. Conclusions

Cold weather preparations were performed in accordance with instructions contained within approved procedures and were completed in a timely manner and without error. Provisions to ensure systems, such as heat tracing, remained operable were adequate.

## O1.3 Power Reduction and Initial Shutdown Activities

### a. Inspection Scope (71707)

On January 6, 2000, the licensee commenced refueling outage 19. The inspectors observed operators perform a planned reactor shutdown and initiation of shutdown cooling. The following documents were reviewed:

- Operations Manual C.3, Revision 18, "Shutdown Procedure"
- Procedure 4179-01 OCD, Revision 3, "Loop A RHR - Shutdown Cooling Mode"
- Procedure 2140, Revision 12, "De-inerting Primary Containment"
- Operations Manual B.03.04-05, Revision 12, "Residual Heat Removal System"

b. Observations and Findings

The inspectors attended the pre-evolution briefing for the reactor shutdown. Attendees included the operator duty crew, a nuclear engineer, a chemist, a quality assurance specialist, the general superintendent of operations, and extra operations department personnel. The shift supervisor discussed the shutdown evolution and reviewed the cautions associated with reactivity management and expectations for core monitoring. Expectations for communications, self- and peer-checking and conservative decision-making were discussed.

Operators reduced power by insertion of control rods and lowering reactor recirculation flow. Power reductions were performed in a controlled manner and nuclear engineering personnel were present, providing oversight and monitoring of thermal limits. Power was reduced to approximately 20 percent, at which point a reactor scram was inserted, completing the shutdown. The licensee planned to conduct main turbine overspeed testing, but reactor decay heat was low and sufficient energy to perform the test was unavailable. This activity was rescheduled for the subsequent startup.

The inspectors observed good communications and annunciator response during the shutdown activities. The licensee entered limiting conditions for operations (LCOs) when required by TS. The inspectors observed that the shutdown activities, control and monitoring of reactor cooldown, and initiation of shutdown cooling were performed in a slow and deliberate manner, and in accordance with the instructions contained in Operations Manual C.3 and Operations Manual B.03.04-05, respectively.

c. Conclusions

Reactor shutdown for a refueling outage was uncomplicated and performed in accordance with instructions contained in approved procedures.

#### O1.4 Fuel Moves and Core Alterations

##### a. Inspection Scope (71707)

The inspectors observed portions of activities associated with refueling. Included as part of this review were the following procedures:

- Operations Manual D.1, Revision 0, "Accountability"
- Operations Manual D.2, Revision 8, "Reactor and Core Components Handling Equipment"
- Procedure 0201, Revision 11, "Refueling Interlocks Weekly Test"
- Procedure 9007, Revision 23, "Procedure for Moving Fuel Into, Out of, and Within the Core"
- Procedure 9010, Revision 13, "Refueling Platform Daily Inspection and Auxiliary Bridge Inspection"
- Procedure 9238, Revision 14, "LPRM Replacement Procedure"

##### b. Observations and Findings

All activities observed by the inspectors were conducted appropriately. Three-part communications were generally used. Licensee management observed fuel handling and identified a few instances where three-part communications could have been used. Refueling equipment checks were conducted in accordance with the instructions contained in procedures. Refueling equipment was only used for its intended purpose.

A senior reactor operator (SRO) was present when required by instructions contained in procedures. The SRO, a refuel floor accountability recorder, and a control room operator maintained a record of fuel moves, as required by instructions in Operations Manual D.1.

##### c. Conclusions

Refueling activities were conducted in accordance with instructions contained in approved procedures by qualified and well-trained operators.

#### O1.5 Secondary Containment Control Emergency Operating Procedure (EOP) Change

##### a. Inspection Scope (71707, 37551)

The licensee initiated a change to Procedure C.5-1300, Revision 6, "Secondary Containment Control." The inspectors reviewed the procedure change to determine if the change impacted the adequacy of the procedure.

b. Observations and Findings

The plant response to high secondary containment ventilation radiation would be automatic isolation of secondary containment ventilation and emergency ventilation, the standby gas treatment system (SGTS), would automatically start. In Safety Review Item, SRI-99-019, Revision 0, "10 CFR 50.59 Evaluation for Differences Between the EOP's and the Design Basis," the licensee identified a concern with manually restarting secondary containment ventilation after it had been isolated and radiation levels indicated acceptable. Specifically, if secondary containment ventilation were restarted, airborne activity that would bypass SGTS could potentially impact the control room design limits for radioactive iodine and result in an unfiltered release of radioactive material to the environment.

In response to this concern, the licensee initiated "Volume F Memorandum," Number 1837, to change Procedure C.5-1300. The licensee's onsite review committee reviewed the change and associated basis for the change, which was documented in SRI-99-019. The procedure change modified the content of the EOP override statement and did not require operator verification that secondary containment ventilation had isolated upon receipt of a high radiation signal. Prior to the change, Procedure C.5-1300 contained such a requirement.

The inspectors reviewed SRI-99-019, which evaluated the differences between the EOP and the design basis, and provided the justification for the change. The inspectors discussed the change with the licensee. The licensee indicated that the intent of the procedure change was to ensure that SGTS remained running after starting, even if radiation levels decreased below the initiation setpoint and secondary containment ventilation could be returned to service. This would ensure that a filtered release through the SGTS was maintained and that the design limits of the control room were not compromised. However, the inspectors identified, and the licensee concurred, that the procedure revision was not comprehensive enough to ensure that this goal was fully met and that the guidance provided could result in an undesirable release. As written, if the conditions for which the original EOP override statement was designed to protect against occurred, the potential existed for the release of a substantial amount of radioactive material contained within secondary containment to the environment without hold-up or filtration.

Following the inspectors discussion of the procedural deficiency with the licensee, the inspectors noted that the licensee did not initiate a condition report (CR) for the deficiency associated with the procedure change. This was discussed with the licensee who subsequently agreed that the procedural inadequacy warranted a CR and initiated CR 20000093 to track this issue. Administrative Work Instruction 4AWI-10.01.03, Revision 12, "Condition Report Process," Step 4.1, stated that "site personnel shall initiate a condition report for conditions which do not or may not conform to requirements." The failure to write a CR, as required by procedure, is considered a violation of minor significance and is not subject to formal enforcement action.

Appendix B, Criterion V, "Instructions, Procedures, and Drawings," of 10 CFR Part 50, required, in part, that activities affecting quality be prescribed by documented instructions of a type appropriate to the circumstances. Contrary to the above, changes made to Procedure C.5-1300 did not provide appropriate guidance for responding to high radiation conditions within secondary containment. This Severity Level IV violation is being treated as a Non-Cited Violation (NCV), consistent with Section VII.B.1.a of the NRC Enforcement Policy (NCV 50-263/99009-01(DRP)). This issue was entered into the licensee's corrective action program as CR 20000093.

c. Conclusions

Changes made to the "Secondary Containment Control," emergency operating procedure introduced non-conservatism and did not meet the intent of the safety evaluation performed by the engineering department. A non-cited violation was issued. Furthermore, a CR was not generated when the engineering department became aware of the procedural inadequacy.

**O8 Miscellaneous Operations Issues**

O8.1 Plant Response During Transition to Year 2000 (Y2K) (Contingency Plan Implementing Procedure (CPIP) 500)

The inspectors observed the plant operations during the Y2K transition per NRC Procedure CPIP 500, Revised December 3, 1999, "On-site Staffing [for Y2K Transition]." No plant transients or computer errors related to plant equipment operation occurred as a result of the transition. The licensee identified two minor issues that were related to computer programs utilized for records management. Subsequent to the transition, these problems were resolved. The inspectors identified no discrepancies.

**II. Maintenance**

**M1 Conduct of Maintenance**

M1.1 General Comments on Maintenance and Surveillance Test Activities

a. Inspection Scope (61726, 62707)

The inspectors observed or reviewed the performance of all or portions of the activities contained in the maintenance and surveillance test procedures listed in the "Licensee Documents and Records Reviewed During the Inspection" section of this report.

b. Observations and Findings

In general, the inspectors observed that maintenance and surveillance test activities were performed in a professional and thorough manner and completed in accordance with the instructions contained within referenced procedures. The workers that were interviewed were knowledgeable of their assigned tasks. When applicable, appropriate radiological work permits were followed. The inspectors observed supervisory and engineering department involvement in the activities and adequate foreign material exclusion controls. Personnel generally demonstrated effective three-part communications, self-checking, and peer-checking. Specific observations of maintenance activities are outlined below.

- The inspectors observed good three-part communications between the technicians performing Procedure 0286, "Torus Water Level Instrument Semi-Annual Calibration Procedure."
- Ultrasonic test equipment used for performance of Procedure STD-UT-3, "Ultrasonic Thickness Measurements," was within calibration. The technician was knowledgeable and had current piping drawings at the job site.
- Design Change Procedure MP-99Q145-2, "Pre-operational Test Procedure for Control Rod Drive Hydraulic System CRD-113 Valves," was clear, comprehensive, and well written.
- Technicians utilizing Procedure 1052-04, "12 Diesel Generator Auxiliary Systems Test," were knowledgeable of associated requirements, used calibrated equipment, and demonstrated good self-checking and communications skills.

c. Conclusions

Good communications skills, technician knowledge, use of three-part communication, self-checking, and engineering involvement were observed during maintenance activities.

M1.2 Tagging Error Results in Near Miss

a. Inspection Scope (62707)

The inspectors reviewed the CR and procedures associated with equipment safety tagging when electrical safety tags were inappropriately cleared prior to the completion of maintenance activities.

b. Observations and Findings

On January 27, 2000, the operations shift supervisor directed clearance of safety tags associated with maintenance on motor-operated valve MO-2067, "HPCI Pump Outboard Discharge Isolation Valve." Upon restoration of the 250 volts-direct current electrical circuit, operators noticed that associated valve indicating lights in the control room failed to illuminate. Operators contacted electrical maintenance personnel to report the discrepancy. Electrical maintenance personnel were conducting a pre-job briefing for connecting electrical power to MO-2067 when they were notified of the discrepancy. Work on MO-2067 was stopped and an investigation into the inappropriate clearing of associated safety tags was initiated.

Shift supervisors had cleared the tags inadvertently due to an administrative error associated with an assumption that maintenance had been completed. Administrative Work Instructions 4AWI-04.04.01, Revision 15, "Equipment Isolation," and 4AWI-04.05.05, Revision 10, "WO [Work Order] Closeout and Disposition," authorized the shift supervisor to clear safety tags without working group signatures on the actual tagging authorization, provided that the computer indicated that the WO had been completed, and that the associated maintenance supervisor had indicated that the safety tags were no longer required by signing the WO as work completed.

The inspectors considered this to be an isolated tagging error because no other safety tagging errors had been observed during the refueling outage period. Therefore, the failure to self-check and verify the proper authorization for clearance of safety tags in accordance with 4AWI-04.04.01, and 4AWI-04.05.05 is considered a violation of minor significance of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," and is not subject to formal enforcement action.

This item was entered into the licensee's corrective action program as CR 20000466, "Isolation Removed Prior to Receiving Proper Release of Tags on Isolation Work Sheet." The licensee categorized this event as a Severity Level-1 CR, the most significant CR identified in the licensee's corrective action program and requiring a full investigation and a root cause analysis. The licensee's immediate corrective actions included safety meetings with shift and maintenance personnel to discuss the event, a modification of procedural requirements that removed the general authorization to clear safety tags when work orders were completed, and a new requirement that all safety tag forms be individually signed by the work group that had initially requested the safety tags for clearance on the actual tagging document. Because site administrative procedures would have allowed this CR to be classified as Level-2, and due to the licensee's strong immediate response to the issue, the inspectors considered the licensee's immediate corrective actions aggressive.

c. Conclusions

Inappropriate assumptions associated with maintenance on a motor-operated valve resulted in safety tags being removed prior to the completion of maintenance on the valve. This "near miss" safety tagging error was entered into the licensee's corrective action program for tracking and resolution. Aggressive immediate and followup corrective actions were initiated.

### M1.3 Residual Heat Removal Service Water (RHRSW) Piping Replacement

#### a. Inspection Scope (62707)

The inspectors reviewed the non-destructive examination techniques used by the licensee on the replaced RHRSW piping.

#### b. Observations and Findings

During the outage, the licensee identified a section of RHRSW piping that was below acceptable minimal wall thickness due to microbiologically induced corrosion, and initiated a WO to replace the applicable section of piping. The licensee planned to use Case N-416-1 of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code as a basis to perform an alternate pressure test in lieu of a hydrostatic pressure test on the replacement piping.

Subsequent to completing the root pass and hot pass weld over the root pass of three welds, the licensee identified that Reg Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1, Revision 12," stated that Case N-416-1 was acceptable to the NRC staff subject to the following condition: "Additional surface examinations should be performed on the root (pass) layer of butt and socket welds of the pressure retaining boundary of Class 3 components when the surface examination method is used in accordance with Section III." The licensee performed magnetic particle testing of the root pass from the inside diameter of the pipe vice the outside diameter as they would normally have done, but in this case could not, since a hot pass weld was over the root pass. The licensee questioned if inside-diameter magnetic testing was equivalent to outside-diameter magnetic testing and initiated CR 20000435, "Weld Physical Exams did not occur in expected order for WO 00000278 - MT [Magnetic Particle Testing] was done on ID [Inside Diameter] not OD [Outside Diameter]," to document and assess this condition.

The licensee concluded that inside-diameter magnetic particle testing was equivalent to outside-diameter magnetic particle testing, based on the fact that the same volume of weld material would be examined and that the exam would identify all indications that an outside-diameter magnetic particle test would. The licensee's weld manual also stated that magnetic particle testing should be performed on the internal surface of the weld. The inspectors reviewed CR 20000435, discussed this issue with NRC regional specialist inspectors, and identified no discrepancies.

#### c. Conclusions

The licensee demonstrated a good questioning attitude while resolving non-destructive examination issues associated with welds on sections of replaced residual heat removal service water system piping.

## **M8 Miscellaneous Maintenance Issues (92902)**

### **M8.1 (Closed) URI 50-263/99007-02(DRP): "Possible failure to follow maintenance procedure during reactor core isolation cooling gasket installation."**

The licensee concluded in Licensee Event Report (LER) 99-008 that the improper gasket had been installed since initial construction. The inspectors found no evidence to contradict the licensee's conclusion. Issues related to the improperly installed gasket were discussed in Section M1.3 of Inspection Report 50-263/99007(DRP). This item is considered closed.

## **III. Engineering**

### **E1 Conduct of Engineering**

#### **E1.1 RHR Heat Exchanger Test Methodology**

##### **a. Inspection Scope (37551)**

The inspectors reviewed the results of Surveillance Test 1136, Revision 20, "RHR Heat Exchanger Efficiency Test."

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

The licensee indicated in CR 19993426 that RHR heat exchanger #12 did not meet the the surveillance test acceptance criterion, which was a unitless value related to the heat exchanger efficiency. The licensee subsequently evaluated the condition and determined that the performance of the heat exchanger was acceptable.

The inspectors reviewed the test data and associated evaluation and found that the licensee had established test parameters, specifically service water flow rates, that were different from the design parameters utilized in the calculation. The inspectors noted that established service water flow rates were low on the heat exchanger that failed and high on the heat exchanger that passed the test. The inspectors were concerned that the heat exchanger that had passed may have had inaccurate performance data in the non-conservative direction. Inspectors reviewed the findings with NRC regional specialist inspectors and determined that this practice may not be acceptable.

The inspectors informed the licensee of their observations and the licensee also concluded that test conditions needed to approximate design as closely as possible. The licensee entered this item into their corrective action program as a modification to CR 19993426, revised the test procedure to better control test parameters, and reconducted the test. Subsequent test data indicated that both heat exchangers performed adequately.

##### **c. Conclusions**

The licensee's methodology for performing residual heat removal heat exchanger efficiency tests did not provide adequate controls on the service water flow rate

parameters established for conducting the test. The licensee corrected the deficiency and successfully confirmed the operability of the associated heat exchangers.

## E1.2 Considerations of Risk in Outage Planning

### a. Inspection Scope (37551, 71707)

The inspectors reviewed the licensee's refueling outage schedule and equipment maintenance windows to verify that outage risk perspectives were appropriately considered. The following documents were reviewed:

- Operations Manual C.3, Revision 18, "Shutdown Procedure"
- NSPPRA [Northern States Power Probabilistic Risk Analysis]-000001, "2000 Outage Risk Assessment"
- Fire protection practices: "Cold Shutdown vs Operation"
- NUMARC [Nuclear Management and Resource Council] 91-06 Review, "Risk Management Guidelines on a Point-by-Point Basis"
- Refueling Schedule (prior to the outage and daily thereafter).

### b. Observations and Findings

The inspectors met with the maintenance superintendent, scheduling personnel, and probabilistic risk assessment experts to discuss the refueling outage schedule and anticipated periods of increased risk. NRC senior risk analysts provided additional review of the outage schedule and risk assessment. The inspectors made the following observations:

- The licensee formed an interdepartmental outage risk management team to ensure that the principles described in the outage management guidelines were reflected in the planned outage schedule.
- Equipment operability and availability requirements listed in Operations Manual C.3 were followed or deviations from the guidelines were appropriately dispositioned.
- Periods of high risk occurred during divisional testing. The licensee conservatively assumed that the equipment would be unavailable during this period and assured appropriate alternate equipment was available.
- Controls were placed on changes to the schedule caused by emergent work or other problems encountered during the work activities. The changes in the schedule were re-evaluated for potential impact on the original risk assessment.
- The licensee conducted two outage status meetings each day to discuss current status of maintenance, modification, and testing activities. Concerns such as coordination of activities between departments were also addressed. Deviations from the scheduled work for the day were discussed in detail.

c. Conclusions

The inspectors concluded that the licensee conservatively applied shutdown risk concepts during the planning and execution for the refueling outage. The implementation of the outage plan was conducted effectively and in a controlled manner.

E1.3 Historical Performance Indicators (37551)

The inspectors conducted a brief review of the licensee's historic performance indicators (PI) submitted per NEI [Nuclear Energy Institute] 99-02, Draft Revision D, "Regulatory Assessment Performance Indicator Guideline." The inspectors observed that the PI for "Safety System Unavailability - Emergency AC [alternating current] Power System" indicated zero unavailable hours for several quarters. The inspectors noted that during periods of emergency diesel generator testing, which were performed monthly, each diesel generator had periods of unavailability. Additionally, the PI for "Safety System Functional Failures - Mitigating Systems" reflected inoperable periods for HPCI, yet the inspectors were aware of other occasions where the licensee made reports of system degradation that may not have been reflected in this indicator.

The inspectors interviewed the diesel system engineer about the method utilized for determining system unavailability and noted that the current methodology was unchanged from the methodology utilized for reporting historical PIs. This concerned the inspectors because of inaccuracies in the historical methodology. The fact that the methodology for determining diesel generator unavailability remained unchanged indicated the potential that the first quarter data could have been incorrectly reported.

The inspectors discussed their observations, and the requirements outlined in NEI 99-02 for historical and first quarter of 2000 reporting with the licensee. The licensee noted the inspectors observations and acknowledged the potential inaccuracies in the data. The licensee had scheduled a meeting with whom to further review this issue and write a CR, if warranted.

## IV. Plant Support

### **R1 Radiological Protection and Chemistry Controls**

#### R1.1 General Comments (71750)

During routine tours of the plant and observations of plant activities, the inspectors found that access doors to locked high radiation areas were properly secured, areas were properly posted, and personnel demonstrated proper radiological work practices. The inspectors reviewed various survey data and radiation work permit (RWP) use and found that personnel were logged onto the correct RWP for the work being performed. Personnel logged into RWPs were wearing proper protective clothing and kept radiation protection personnel informed of activities as required by the RWP.

## **S1 Conduct of Security and Safeguards Activities**

### **S1.1 General Comments (71750)**

The inspectors observed the licensee implement proper physical security measures associated with the integrity of protected area barriers, personnel and package access, visitor escorts, and personnel searches. The NRC inspectors noted no deficiencies with the performance of security activities.

## **F2 Status of Fire Protection Facilities and Equipment**

### **F2.1 General Comments (71750)**

During normal resident inspection activities, routine observations were conducted in the area of fire protection. Fire extinguishers and fire hoses were properly stored and inspected by licensee personnel. No notable degradation of equipment was noted.

## **V. Management Meetings**

### **X1 Exit Meeting Summary**

The inspectors presented the inspection results to members of licensee management on February 2, 2000. 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

B. Day, Plant Manager  
J. Grubb, General Superintendent Engineering  
M. Hammer, Site Manager  
K. Jepson, Superintendent, Chemistry & Environmental Protection  
E. Reilly, General Superintendent Maintenance  
C. Schibonski, General Superintendent Safety Assessment  
E. Sopkin, General Superintendent Operations  
L. Wilkerson, Manager Quality Services  
J. Windschill, General Superintendent, Radiation Services

### NRC

R. Lanksbury, Chief, Reactor Projects Branch 5

## INSPECTION PROCEDURES USED

IP 37551: Onsite Engineering  
IP 61726: Surveillance Observations  
IP 62707: Maintenance Observations  
IP 71707: Plant Operations  
IP 71714: Cold Weather Preparations  
IP 71750: Plant Support Activities  
IP 92902: Followup - Maintenance  
CPIP 500: On-site Staffing [for Y2K transition]

## ITEMS OPENED, CLOSED AND DISCUSSED

### Opened

50-263/99009-01 NCV Inappropriate change to an emergency operating procedure

### Closed

50-263/99009-01 NCV Inappropriate change to an emergency operating procedure

50-263/99007-02 URI Possible failure to follow maintenance procedure during RCIC gasket installation

### Discussed

None

## LICENSEE DOCUMENTS AND RECORDS REVIEWED DURING THE INSPECTION

The following is a list of licensee documents reviewed during the inspection, including documents prepared by others for the licensee. Inclusion on this list does not imply that NRC inspectors reviewed the documents in their entirety, but, rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. NRC acceptance of the documents or any portion thereof is not implied.

### I. Design Change Procedures

00Q010, Revision 0, "Air Operated Valve Pre Operational Test Procedure"

MP-99Q145-2, Revision 0, "Pre-operational Test Procedure for Control Rod Drive [CRD] Hydraulic System CRD-113 Valves"

MP-99Q220-03, Revision 0, "#11EDG [emergency diesel generator] Pre-op/Load Test for #11 EDG Droop Mod. & WO 0000025"

### II. Procedures

0047, Revision 8, "SRM [source range monitor] Functional Test"

0137-04, Revision 10, "Primary Containment Purge, Vacuum Breaker, & "A" CGCS [combustible gas control system] Discharge Isolation Valve LLRT [local leak rate test]"

0137-24 Revision 9, "Primary Containment Vent, Hard Pipe Vent, "B" CGCS Discharge Isolation Valve LLRT"

0137-29, Revision 3, "LPCI [low pressure coolant injection] Loop 'B' Injection Valves Local Leak Rate Test"

0141, Revision 15, "Reactor Building to Torus Vacuum Breaker Operability Test"

0187-02, Revision 31, "12 Emergency Diesel Generator/12 Emergency Service Water Pump System Tests"

0224, Revision 5, "APRM [average power range monitor] Time Response Test Procedure"

0255-02-IB, Revision 25, "Relief Valve Setpoint and Leak Checks"

0286, Revision 5, "Torus Water Level Instrument Semi-Annual Calibration Procedure"

1052-04, Revision 3, "12 Diesel Generator Auxiliary Systems Test"

1079-01, Revision 2, "11 Emergency Diesel Generator Overspeed Trip Check"

1136, Revision 20, "RHR Heat Exchanger Efficiency Test"

4107-02-OCD, Revision 3, "12 Emergency Diesel Generator 2 Cycle"

4292PM, Revision 5, "SCRAM Valve Diaphragm"

4514-01, Revision 3, "Inboard MSIV [main steam isolation valve] Disassembly and Reassembly"

4900-01-PM, Revision 13, "PM [preventative maintenance] for Limitorque Motor Operated Valves"

8024, Revision 4, "Inboard MSIV Stem and Disc Changeout"

8863, Revision 0, "Jet Pump Riser Brace Sampling Procedure"

9207, Revision 15, "Remove Drywell Head"

9220, Revision 14, "Remove RPV [reactor pressure vessel] Head"

9225, Revision 7, "Unlatch Steam Separator"

9227, Revision 13, "Main Steam Line Plug Installation"

Ultrasonic thickness measurements of RHRSW piping, including: STD-UT-3, Revision 5, "Ultrasonic Thickness Measurements"; STD-UT-11, Revision 2, "Ultrasonic Detection of Pitting"; PTIP2.2, Revision 1, "Layout and Marking of Piping Components"

### **III. Work Orders**

9906951, Modification 99Q060, Revision 0, "Modify Instrument Air Isolation Valve Piping"

0000004, "CRD [control rod drive] Charging Water Isolation Valve Replacement"

0000169, "Disassemble and Reassemble AO-2-80D [Air-Operated, Inboard MSIV]"

## LIST OF ACRONYMS USED

APRM	Average Power Range Monitor
ASME	American Society of Mechanical Engineers
AWI	Administrative Work Order
CFR	Code of Federal Regulations
CGCS	Combustible Gas Control System
CPIP	Contingency Plan Implementing Procedure
CR	Condition Report
CRD	Control Rod Drive
DRP	Division of Reactor Projects
EDG	Emergency Diesel Generator
EOP	Emergency Operating Procedure
HPCI	High Pressure Coolant Injection
IP	Inspection Procedure
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LLRT	Local Leak Rate Test
LPCI	Low Pressure Coolant Injection
MSIV	Main Steam Isolation Valve
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
NSP	Northern States Power
PDR	Public Document Room
PI	Performance Indicators
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RWP	Radiation Work Permit
SGTS	Standby Gas Treatment System
SRI	Safety Review Item
SRM	Source Range Monitor
SRO	Senior Reactor Operator
TS	Technical Specification
URI	Unresolved Item
USAR	Updated Safety Analysis Report
VIO	Violation
WO	Work Order
Y2K	Year 2000