July 18, 2000

Mr. Mark L. Marchi
Site Vice President
Kewaunee Plant
Wisconsin Public Service
Corporation
Post Office Box 19002
Green Bay, WI 54307-9002

SUBJECT: KEWAUNEE INSPECTION REPORT 50-305/2000008(DRP)

Dear Mr. Marchi:

On June 22, 2000, the NRC completed an inspection at your Kewaunee Nuclear Power Plant. The results of this inspection were discussed on June 22, 2000, with Mr. D. Braun and other members of your staff. The enclosed report presents the results of that inspection.

This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within those areas, the inspection consisted of a selective examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, five issues of very low safety significance (Green) were identified. Three of these issues were determined to involve violations of NRC requirements. However, the violations were not cited due to their very low safety significance and because they have been entered into your corrective action program. If you contest these non-cited violations, 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; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Kewaunee facility.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available **electronically** for public inspection in the NRC Public Document Room **or** from the *Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from* the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Melvyn N. Leach, Chief,
Reactor Projects Branch 2

Docket No. 50-305
License No. DPR-43

Enclosure: Inspection Report
50-305/20000-08(DRP)

cc w/encl: K. Weinhauer, Manager, Kewaunee Plant
B. Burks, P.E., Director, Bureau of Field Operations
Chairman, Wisconsin Public Service Commission
State Liaison Officer

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-305
License No:	DPR-43
Report No:	50-305/20000-08(DRP)
Licensee:	Wisconsin Public Service Corporation
Facility:	Kewaunee Nuclear Power Plant
Location:	N 490 Highway 42 Kewaunee, WI 54216
Dates:	May 23 through June 22, 2000
Inspectors:	J. Lara, Senior Resident Inspector Z. Dunham, Resident Inspector
Approved By:	Melvyn N. Leach, Chief Reactor Projects Branch 2 Division of Reactor Projects

NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	Radiation Safety	Safeguards
● Initiating Events	● Occupational	● Physical Protection
● Mitigating Systems	● Public	
● Barrier Integrity		
● Emergency Preparedness		

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: http://www.nrc.gov/NRR/OVERSIGHT/index.html.

SUMMARY OF FINDINGS

Kewaunee Nuclear Power Plant
NRC Inspection Report 50-305/20000-08(DRP)

The report covers a five-week period of resident inspection. The significance of issues is indicated by their color (green, white, yellow, and red) and was determined by the Significance Determination Process in Inspection Manual Chapter 0609.

Cornerstone: Mitigating Systems

- Green. The inspectors reviewed the licensee's implementation of the maintenance rule for failures associated with a reactor head vent valve. The licensee's corrective action documents identified a potential maintenance rule functional failure but the completed evaluation of the problem did not document the final determination. However, the inspectors identified that the repeated failures may have been prevented if maintenance activities such as valve disassembly and cleaning had been performed. In this case, maintenance rule reliability goals were not exceeded. The licensee had documented similar maintenance rule program deficiencies and developed a corrective action program to address the deficiencies. Although programmatic deficiencies exist, since no maintenance rule reliability criteria had been exceeded, this issue was considered of very low risk significance. (Section 1R12)

- Green. The inspectors identified that the refueling water storage tank low-low level alarm which was actuating five percent higher than normal had not been documented in a Kewaunee Assessment Process form by the licensee, and therefore had not received an operability evaluation. This failure was identified as contrary to site administrative procedures. Following the licensee's documentation of the problem, the inspectors identified that the associated operability evaluation considered the acceptability of an operator workaround to address the issue, but did not address any safety implications or consequences of the alarm actuating early. A subsequent operability evaluation by the licensee was evaluated as adequate by the inspectors. Since the subsequent operability evaluation was adequate and it was determined that no safety mitigation equipment was adversely affected by the early actuation of the alarm, this issue was considered of very low risk significance. A non-cited violation (NCV) was identified for failing to document a non-conforming condition, contrary to site administrative procedure requirements. (Section 1R15)

- Green. The licensee identified that the suction relief valve for an auxiliary feedwater pump may have failed its relief test criteria, but did not process the documented deficiency until several weeks later. The licensee then expanded the scope of the relief testing to the suction relief valves associated with the other auxiliary feedwater pumps to meet technical specification requirements. Since any one train of auxiliary feedwater was capable of supplying 100 percent of the decay heat removal requirements, this issue was screened as very low risk significance. However, the time delay in complying with technical specification requirements for testing other relief valves was identified as an NCV. (Section 1R22)

- Green. The licensee identified that the circuitry associated with the residual heat removal system discharge to safety injection system suction isolation valves did not meet single failure criteria. The inspectors noted that this design requirement was identified in the facility's updated safety analysis report. The licensee subsequently implemented a temporary change to the facility. The inspectors reviewed the issue and identified that the facility had been operating outside of its design basis, which was reportable to the NRC. The licensee subsequently made a one hour non-emergency report to the NRC. Since there was no actual loss of safety function to the system, this issue was screened as very low risk significance. (Section 1R23)

- No Color. The inspectors interviewed operators to evaluate their awareness of degraded control room indications and alarms, and their ability to adequately take manual actions based on degraded alarm functions. The inspectors identified, during interviews, that there was a lack of awareness by operators of a degraded refueling water storage tank low-low level alarm which would be potentially confusing to operators and therefore increase the risk associated with initiating long term sump recirculation. (Section 0A4)

Cornerstone: Barrier Integrity

- Green. The licensee identified, following plant startup, that a computer alarm had not been updated properly to alarm if axial flux distribution deviated outside of the flux distribution target band. This condition was contrary to technical specification requirements. The licensee reviewed the axial flux distribution history since the startup and determined that at no time was the flux distribution outside of the target band. Since the axial flux distribution was never outside of the target band, this issue was screened as very low risk significance. An NCV was identified for failing to comply with technical specification requirements for monitoring axial flux distributions. (Section 1R20)

Report Details

Summary of Plant Status: The unit was off-line due to a refueling outage at the beginning of this inspection period until June 2, 2000, when the unit was synchronized to the grid to end the 2000 refueling outage. On June 6, a manual reactor trip occurred. On June 7, operators restarted the unit and synchronized to the grid. The unit operated at up to approximately 93 percent power throughout the rest of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather

a. Inspection Scope

On June 19, 2000, the inspectors conducted a general walkdown and inspection of equipment located external to the site buildings which could be susceptible to high wind or tornado damage. The inspectors examined the areas for loose debris and materials which, if airborne during high winds, could damage or impact external equipment operation. Additionally, the inspectors examined the technical support center diesel generator radiator which was located on the roof of the turbine building for susceptibility to high wind or tornado damage. The licensee technical support center diesel generator was designed to serve as an alternate power source during a station blackout event. A station blackout event accounted for over 30 percent of the site core damage frequency of 3.6E-5/year. The following documents were reviewed:

- Updated Safety Analysis Report (USAR), Section 2.7, “Meteorology”
- Kewaunee Individual Plant Examination for External Events, Section 5.1, “High Winds and Tornadoes”
- Kewaunee Individual Plant Examination, Section 5.0, “Core Damage Frequency Quantification”
- E-0-05, “Natural Disaster,” Revision I

b. Findings

There were no findings identified.

1R04 Equipment Alignments

a. Inspection Scope

On June 20, 2000, the inspectors performed a partial walkdown of the ‘B’ train Service Water (SW) system and its associated support systems while the ‘A’ train SW system was out of service for replacement of the 1A1 SW pump motor. The SW system had been evaluated by the licensee as one of the top ten most important systems for reactor safety based on risk analysis. The inspectors verified the correct valve positions for portions of the ‘B’ train of the SW system using the system piping and instrumentation

drawings and the system lineup checklist. The inspectors observed that instrumentation valve configurations and appropriate pressure and flow meter indications were also acceptable. The inspectors periodically verified proper installation of hangers and supports, verified operational status of support systems, observed proper control room switch positions and local breaker positions for the system, and reviewed abnormal system operating procedures. The inspectors also evaluated other conditions such as adequacy of housekeeping, the absence of fire ignition sources, and proper labeling.

The following documents were reviewed:

- N-SW-02-CL, "Service Water System Prestartup Checklist," Revision AO
- N-SW-02, "Service Water System," Revision S
- A-SW-02, "Abnormal Service Water System," Revision P
- Technical Specifications (TS), Section 3.3.e, "Service Water System"
- USAR, Section 9.6.2, "Service Water System"

b. Findings

There were no findings identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors performed walkdowns of various elevations within the auxiliary building and the containment building. These areas were selected due to extended work activities during the refueling outage.

Emphasis was placed on control of transient combustibles and ignition sources; the material condition, operational lineup, and operational effectiveness of the fire protection systems, equipment, and features; and the material condition and operational status of fire barriers used to prevent fire damage or fire propagation.

In particular, the inspectors verified that all observed transient combustibles were being controlled in accordance with the licensee's administrative procedures. In addition, the inspectors observed the physical condition of fire detection devices, such as overhead sprinklers, and verified that any observed deficiencies did not impact the operational effectiveness of the system. The inspectors observed the physical condition of portable fire fighting equipment, such as portable fire extinguishers, and verified the equipment was located appropriately and that access to the extinguishers was unobstructed. The inspectors verified that fire hoses were installed at their designated locations. The inspectors verified that the physical condition of the hoses was satisfactory and that access to the hoses was unobstructed. The inspectors observed the physical condition of passive fire protection features such as fire doors, ventilation system fire dampers, fire barriers, fire zone penetration seals, and fire retardant structural steel coatings. The inspectors verified the passive fire protection features were properly installed and in good physical condition.

The following documents were reviewed:

- Fire Plan Procedure (FPP) 08-07, "Control of Ignition Sources," Revision D
- FPP 08-08, "Control of Transient Combustibles," Revision A
- FPP 08-12, "Fire Prevention Tour," Revision B
- FPP 08-14, "Fire Protection Shutdown Policy," Original Revision

b. Findings

There were no findings identified.

1R06 Flood Protection Measures

.1 Internal Flooding Susceptibility of Diesel Generator (DG) Room 'A'

a. Inspection Scope

On June 6, 2000, the inspectors conducted an inspection of the 'A' DG room which had an internal flooding initiating event frequency of 5.0E-4/year. This initiating event frequency was the highest of all the internal flooding event initiators. The core damage probability associated with an internal flooding event of the 'A' DG room was 1.2E-7/year. The inspectors noted that the susceptible component initiators for internal flooding in the 'A' DG room were the flexible four inch SW couplings which supply and return SW from the DG's heat exchangers. The facility's 'A' train of 4 kilovolt safety related breakers were also located in this room. The inspectors reviewed the licensee's individual plant examination on internal flooding and interviewed licensee personnel to evaluate the licensee's internal flooding assumptions. The inspectors inspected the 'A' DG room to confirm the flooding analysis assumptions, inspected door seals and clearances, inspected available drainage capability, and examined the room for unsealed penetrations which could be potential flood sources from outside the room.

b. Findings

There were no findings identified.

.2 External Flooding Susceptibility and Mitigation

a. Inspection Scope

The inspectors reviewed and inspected the licensee's facility for susceptibility and mitigation from an external flooding event. The inspectors conducted walkdowns of the site drainage ditches to check for potential blockage; inspected the site topography for low areas susceptible to water retention and flooding; and inspected external equipment such as the switchyard and transformer bays which, if flooded, could contribute to a loss

of off-site power. Loss of off-site power was the largest contributor to the facility's core damage frequency. Additionally, the inspectors conducted a walkdown of the licensee's natural disaster procedure E-0-05. The following documents were reviewed:

- E-0-05, "Natural Disaster," Revision I
- USAR, Section 2.6.3, "General Site Hydrology"
- Kewaunee Individual Plant Examination for External Events, Section 5, "Other External Events Analysis"

b. Findings

There were no findings identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope

The inspectors reviewed the licensee's implementation of the maintenance rule requirements to ensure that component and equipment failures were identified, entered, and scoped within the maintenance rule and that select structures, systems, or components were properly categorized and classified as (a)(1) or (a)(2) in accordance with 10 CFR 50.65. The inspectors also verified that issues were identified at an appropriate threshold and entered in the corrective action program.

Specific components or system problems evaluated were:

- Failure of Valve RC-45B to open (KAPs 0314, 1066, 2105)
- Valve Residual Heat Removal (RHR)-299A seat leakage (KAPs 1034, 1075, 1096)
- Component cooling pump oil/seal water leaks (KAPs 1430, 1436, 2143, 2158)
- DG air start solenoid valve issues and lube oil cooler failure (KAPs 1304, 1305, 1387)

In addition to the KAPs listed above, the inspectors reviewed the following documents:

- Nuclear Administrative Directive 8.20, "Maintenance Rule Implementation," Revision A
- General Nuclear Procedure (GNP) 8.20.1, "Maintenance Rule Scoping and Performance Criteria," Revision A
- GNP 8.20.2, "Maintenance Rule Data Evaluation and Goal Setting," Revision A

b. Findings

Failure of Valve RC-45B to open

The inspectors reviewed KAP Work Order (WO) 1066 which was initiated on April 25, 2000, to document that reactor head vent valve RC-45B failed to open as required when operators were draining the reactor coolant system. The valve again failed to open on April 27. The inspectors reviewed the KAP documentation and noted

that the KAP indicated that the problem was a potential maintenance rule functional failure (MRFF). Through a review of previously issued KAPs, the inspectors noted that this valve also failed to open in September 1996 (KAP 0314).

The licensee attributed the failure of the valve to open to sluggishness or stickiness due to long periods of non-operation (18 months) and possible small particles of grit or debris which could cause sticking. The manufacturer recommended light tapping with a mallet to free the valve and flushing and cycling the valve several times to remove any debris or grit and to verify that the valve was operating properly. In all three instances, repeated cycling attempts or light tapping with a mallet freed the valve to allow successful operations. The inspectors did not identify any other KAPs which documented this same problem on any of the other vent valves although they were of the same type and design.

The inspectors noted that although KAP WO 1066 documented this issue as a potential MRFF, the KAP documentation did not discuss the MRFF determination. The operation of the reactor head vent valves were included in the licensee's maintenance rule program as a low risk significant function. The function was to provide a vent path for the reactor vessel for non-condensible gases and to support natural circulation during post-accident conditions. The reliability criteria was less than 2 maintenance preventable function failures per system per 18 months (the vent system included one valve per train, i.e., parallel valves). The inspectors discussed with licensee personnel the potential that the valve's repeated failure to open on demand may have been preventable by maintenance such as valve disassembly and cleaning. This was evident since other similar valves have not exhibited the same failure mode and Valve RC-45B had a history of failing to open on demand.

The licensee informed the inspectors that KAP WO 2105 had already been written to document similar problems in the implementation of the maintenance rule program. The KAP documented that not all MRFFs identified through the WO reviews had a KAP associated with the MRFF, a significant amount of MRFF evaluations had not been completed in a timely manner, and several category a(1) evaluations had not been completed in a timely manner. The licensee developed a corrective action plan and assigned personnel to address these problems.

The inspectors used the significance determination process (SDP) to evaluate the risk significance of this issue. This issue was considered to be of very low safety (Green) significance based on the determination that although the licensee had not addressed the root cause of the problem to prevent recurrence and although programmatic deficiencies exist, maintenance rule reliability criteria had not been exceeded.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's evaluation of plant risk, scheduling, and configuration control during the planned and emergent work activities listed below. In particular, the inspectors verified that the licensee's planning and management of online risk were adequate. The inspectors also verified that licensee actions to address

increased online risk during these periods were in accordance with approved administrative procedures. The inspectors reviewed appropriate sections of the USAR and TS, interviewed licensee personnel, and reviewed Nuclear Administrative Directive 8.2, "Work Request/Work Order," Revision D.

- Emergent work associated with the Auxiliary Feedwater (AFW) suction relief valve MU-320B (Work Order 00-002076-000)
- Motor replacement of SW pump 1A1 (work request 99-217470-000)
- Charging pump 1B preventive maintenance (Preventative Maintenance Procedure (PMP) 35-09, "CVC-QA-1 Charging Pump Pulsation Dampener Maintenance," Revision N)

b. Findings

There were no findings identified.

1R14 Nonroutine Plant Evolutions

a. Inspection Scope

On June 7, 2000, the inspectors reviewed the licensee's performance following a manual reactor trip due to an abnormal temperature indication of the 'A' reactor coolant pump (RCP) radial bearing. During post-trip reviews, the inspectors evaluated the performance and interactions between the reactor operators, control room supervisor, and shift supervisor. Additionally, the inspectors evaluated adherence to the licensee's communications and alarm response operations standards, and use and adherence to abnormal, alarm response and emergency operating procedures. Documents reviewed included emergency operating procedures E-O, "Reactor Trip or Safety Injection," Revision Q, and ES-0.1, "Reactor Trip Response", Revision M. The inspectors also verified plant equipment operated as designed following the reactor trip.

b. Findings

There were no findings identified.

1R15 Operability Evaluations

a. Inspection Scope

On June 9, 2000, the inspectors questioned the licensee regarding the operability determination associated with an out-of-service tag (1411) on the Refueling Water Storage Tank (RWST) level alarm. The work request associated with this tag had been written on May 8 based on the alarm being received at a level of nine percent instead of four percent during preparations for refueling activities. This alarm was considered important since it was referenced in emergency procedures and directed control room operators to secure any operating pump taking suction from the RWST upon receipt of

the alarm in preparation for initiating long term sump recirculation. The following documents were reviewed:

- USAR, Section 6
- USAR, Section 14
- Drawing E-2035
- Calculation RESP-23-018, Caustic Required To Maintain pH>7.0 in Containment Sump Post-LOCA, Revision 1
- Integrated Plant Emergency Operating Procedure ES-1.3, "Transfer to Containment Sump Recirculation," Revision Q
- Alarm Response Procedure (ARP) 47023-A, "RWST Level Low-Low," Original Revision
- Nuclear Administrative Directive - 11.08, "Kewaunee Assessment Process (KAP)," Revision D

b. Findings

The inspectors were informed that a KAP had not been written to document the non-conforming condition of the alarm, and therefore an operability evaluation had not been performed. The licensee subsequently initiated KAP Work Request (WR) 2168, "RWST Low-Low Level Alarm", to document the issue. The licensee documented in the KAP the acceptability of an Operator Workaround (OWA) initiated to address this issue (OWA discussed in Section 1R16). However, the inspectors noted that the KAP did not address the safety consequences of securing the operating pumps at an earlier RWST level than stated in the emergency procedures due to the mis-calibrated alarm setpoint. This situation would potentially result in having less water injected into the RCS and less sodium hydroxide sprayed into the containment for iodine scrubbing during postulated design accident conditions. The five percent difference corresponded to approximately 16,000 gallons. The licensee performed additional evaluations and concluded that accident mitigation assumptions were not violated. Considerations included sufficient volume of water injected into the RCS, sufficient available net positive suction head for the RHR pumps from the containment sump, and sufficient iodine scrubbing from the containment spray system.

Nuclear Administrative Directive 11.08, Section 5.2.1, required, in part, for the shift supervisor to ensure a KAP Administrative Work Request is completed for significant plant problems which involve operability concerns. The failure to document the issue in a KAP and perform an operability determination was considered a violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings". However, this violation is associated with an inspection finding that is characterized by the Significance Determination Process as having very low risk significance (i.e., green) and is being treated as a Non-Cited Violation, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 50-305/2000008-01, Failure to Initiate KAP and Document RWST Level Low-Low Alarm Inoperability). This violation is in the licensee's corrective action program as KAP WR 00-002168.

The inspectors used the SDP to evaluate the risk significance of this issue. This issue was considered to be of very low safety significance based on the determination that although a KAP had not been written to document the non-conforming condition, subsequent operability determinations were determined to be adequate and system mitigation functions would not have been affected.

1R16 Operator Work-Arounds

a. Inspection Scope

The inspectors reviewed OWAs to identify any potential affect on the function of mitigating systems or operators' ability to respond to an event and implement abnormal and emergency operating procedures. The inspectors also evaluated whether there were OWA's which had not been identified by the licensee. The inspectors evaluated the problems associated with RCP cooling water outlet temperature indicator 612 and RWST low-low level alarm. The inspectors reviewed the following documents:

- Operations Department Instruction, "Operator Workarounds," April 22, 1999
- Electrical Drawing 2055
- Alarm Response Procedure (ARP) 47015-J, "RXCP A/B Total CC Wtr Outlet Temp High," Original Revision
- Work Request 00-001895-000
- Operations Abnormal Procedure A-RC-36C "Abnormal Reactor Coolant Pump Operation", Revision M
- Work Request 00-001895
- USAR, Section 6.2, "Safety Injection System"
- USAR, Section 6.4, "Containment Vessel Internal Spray System"
- USAR, Section 14.3, "Reactor Coolant System Pipe Ruptures (Loss of Coolant Accident)"
- Integrated Plant Emergency Operating Procedure (IPEOP) ES-1.3, "Transfer to Containment Sump Recirculation," Revision Q
- ARP 47023-A, "RWST Level Low-Low," Original Revision
- KAP 00-002168-000, "RWST Low-Low Level Alarm"
- OWA 00-007
- KAP WR 00-001411

b. Findings

Discussion

On June 12, 2000, the inspectors evaluated whether the RWST Low-Low Level alarm actuating early created an undue challenge to the control room operators or required compensatory actions. Operator actions were required to switch the plant from the injection phase to long term sump recirculation upon receiving the RWST Low-Low Level alarm. The inspectors identified that both Procedures IPEOP ES-1.3 and ARP 47023-A, required control room operators to take manual actions to stop any pumps which were taking suction from the RWST upon receiving the RWST Level Low-Low alarm at four percent. The inspectors interviewed control room operators and the shift supervisor and it was evident that control room personnel were not fully aware

of the alarm problem and its effect on use of IPEOP ES-1.3. The inspectors noted that although this condition met the requirement for an OWA as defined in the licensee's operations department instruction, an OWA had not been issued. The inspectors brought this issue to the licensee's attention. The licensee subsequently issued OWA 00-007. The inspectors reviewed the OWA and determined it to be adequate. The RWST Level Low-Low alarm was repaired on June 14, and the OWA was removed.

The inspectors used the SDP to evaluate the risk significance of this issue as part of the assessment performed for overall safety significance as documented in Section 1R15 of this report. This issue was considered to be of very low safety significance based on the determination that the design basis of the plant would have been fulfilled if the operators took the required manual actions at the RWST Level Low-Low alarm at 9 percent instead of at the normal 4 percent level.

1R19 Post Maintenance Testing

a. Inspection Scope

During post maintenance testing activities, the inspectors verified that the test was adequate for the scope of the maintenance work which had been performed and that the testing acceptance criteria were clear and demonstrated operational readiness consistent with the design and licensing basis documents. The inspectors also verified that the impact of the testing had been properly characterized during the pre-job briefing; the test was performed as written and all testing prerequisites were satisfied; and the test acceptance criteria were satisfied. Following the completion of the test, the inspectors verified that the test equipment was removed and that the equipment was returned to a condition in which it could perform its safety function. Post maintenance test activities were observed for the following components:

- Service water pump 1A1 following motor replacement
- Charging pump 1B following preventive maintenance

The following documents were reviewed:

- PMP 35-09, "CVC-QA-1 Charging Pump Pulsation Dampener Maintenance," Revision N
- Operations Procedure N-CVC-35B, "Charging and Volume Control," Revision AC
- Surveillance Procedure (SP) 02-292, "Service Water Pump Reference Values Determination," Revision D
- SP 02-138, "Service Water Pump and Valve Test - IST," Revision AQ
- PMP 02-03, "SW-Service Water Pump Replacement QA-1," Revision N
- SP 55-177, "Inservice Testing of Pumps Vibration Measurements," Revision U
- TS, Section 3.3.e, "Service Water System"
- USAR, Section 9.6.2, "Service Water System"

b. Findings

There were no findings identified.

1R20 Refueling and Outage

.1 Plant Startup Following Refueling Outage

a. Inspection Scope

The inspectors observed work activities associated with the plant startup following a refueling outage which began on April 22, 2000. The inspectors assessed the adequacy of operations activities to support reactor startup, configuration management, and equipment tagouts. Additionally, the inspectors observed portions of the reactor startup and conducted reviews for risk management, conformance to approved site procedures, and compliance with TS. The following major activities were observed:

- Reactor coolant system fill and vent
- Plant startup and main turbine latching

In addition to TS and the USAR, the inspectors also reviewed the following documents:

- N-RC-36D, "Filling and Venting the Reactor Coolant System," Revision AC
- Temporary Change Request (TCR) 00-013, Temporary Changes to the Service Water System
- N-0-01, "Plant Startup from Cold Shutdown Condition to Hot Shutdown Condition," Revision AQ
- N-0-01-CLC, "Plant Requirements Before Exceeding 350F," Revision V
- N-0-02, "Plant Startup from Hot Shutdown to 35% Power," Revision AC
- N-0-02-CLA, "Plant Prestartup Checklist," Revision K
- N-CRD-49B, "Reactor Startup," Revision Y
- A-CRD-49D, "Malfunctioning Rod Position Indicator," Revision Q
- A-NI-48, "Abnormal Nuclear Instrumentation," Revision R
- KAP WR 00-002207, "Start Outside Target Band TLA-3"

b. Findings

Discussion

On June 14, 2000, the licensee identified that the Axial Flux Distribution (AFD) alarm had not been properly set. Therefore, the alarm would not have alerted operators of being outside the AFD target band. The computer axial flux target bands were the target bands which had been in effect prior to shutdown and had not been reset following the refueling outage. The licensee reviewed the AFD since the plant startup and determined that the AFD was at no time outside of the target band. The inspectors did not identify any other issues or findings. The licensee planned to submit a Licensee Event Report (LER).

Technical Specification 3.10.b.13 required, in part, that alarms shall normally be used to indicate nonconformance with TS flux difference requirements and that if alarms are temporarily out of service, the AFD shall be logged, and conformance with the limits assessed every hour for the first 24 hours and half-hourly thereafter. The failure to update the computer alarm target bands, which placed the alarm out of service, was a

violation of TS 3.10.b.13. However, this violation is associated with an inspection finding that is characterized by the Significance Determination Process as having very low risk significance (i.e., green) and is being treated as a Non-Cited Violation, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 50-305/2000008-02, Failure to Update Computer Alarm for Current Axial Flux Distribution Target Band). This violation is in the licensee's corrective action program as KAP WR 00-002207.

The inspectors used the SDP to evaluate the risk significance of this issue. The issue was of very low safety significance based on the AFD not being outside of the target band.

.2 Reactor Startup Following Plant Trip

a. Inspection Scope

The inspectors observed the reactor startup following a manual reactor trip due to an abnormal temperature indication of the 'A' RCP radial bearing. The inspectors reviewed the licensee's post trip review and observed and verified compliance of TS requirements during the startup. Additionally, the inspectors reviewed the licensee's response to a delayed startup following the reactor trip due to an incorrect estimated critical position calculation. The estimated critical position calculation had relied on assumptions on equilibrium core reactivity which were not accurate early in core life. The following documents were reviewed:

- N-0-02, "Plant Startup from Hot Shutdown to 35% Power," Revision AC
- N-CRD-49B, "Reactor Startup," Revision Y
- GNP 2.2.1, "Guidelines For Post Trip Activities," Original Revision

b. Findings

There were no findings identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors observed surveillance testing on risk-significant equipment and verified that the equipment was capable of performing its intended safety function and that the surveillance tests satisfied the requirements contained in TS, the USAR, and licensee procedures. During the surveillance tests, the inspectors verified that the test was adequate to demonstrate operational readiness consistent with the design and licensing basis documents and that the testing acceptance criteria were clear. The inspectors also verified that the test was performed as written and all testing prerequisites were satisfied and that the test data was complete, appropriately verified, and met the requirements of the testing procedure. Following the completion of the test, the inspectors verified that the test equipment was removed and that the equipment was returned to a condition in which it could perform its safety function.

The inspectors observed and reviewed the performance of the following surveillance testing on risk significant equipment:

- SP-56A-090, "Containment Local Leak Rate Type B & C Test," Revision G, (Valves RC-412 and RC-413)
- SP-23-100, "Containment Spray Pump and Valve Test - IST," Revision AH
- SP-55-155A, "Engineered Safeguards Train A Monthly Logic Channel Test," Revision K

The inspectors also reviewed the circumstances involving missed surveillance testing activities regarding auxiliary feedwater relief valves. The inspectors reviewed KAP WR 00-001179 and American Society for Mechanical Engineers (ASME)/American National Standards Institute (ANSI) Operation and Maintenance of Nuclear Power Plants (OM) Part 10.

b. Findings

Discussion

On April 28, 2000, the licensee initiated KAP WR 00-001179 to document that the suction relief valve for motor driven AFW pump 'B', Valve MU-320B, may have failed its relief test criteria based on excessive seat leakage preventing the valve from lifting at its relief setpoint pressure of 125 pounds per square inch. However, the KAP was not processed until several weeks later on June 14. After the KAP was processed, the licensee recognized that there was a potential deficiency with Valve MU-320B, and that the scope of the relief testing should have been extended to the suction relief valves associated with the motor driven AFW pump 'A' and the turbine driven AFW pump, Valves MU-320A and MU-320C, per American Society for Mechanical Engineers (ASME)/American National Standards Institute (ANSI) Operation and Maintenance of Nuclear Power Plants (OM) Part 10. The failure to expand the surveillance testing scope as required by TS 4.2.a.2 and ASME/ANSI OM Part 10, resulted in the licensee entering a 24 hour limiting condition for operation, which allowed for the testing to be accomplished within 24 hours of identification of a missed surveillance requirement. The licensee tested the two valves later that same day and determined that the lift pressure of Valve MU-320C exceeded the required three percent acceptance range. The other valve's lift pressure was within the acceptance criteria. The licensee subsequently reset and adjusted Valve MU-320C to the required lift setpoint and successfully tested the valve. The licensee planned to submit an LER.

Technical Specification 4.2.a.2 required, in part, that in-service testing of ASME Code Class 3 valves shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code. Section XI of the ASME Boiler and Pressure Vessel Code required, in part, that in-service testing of ASME Code Class 3 valves shall be performed in accordance with ASME/ANSI OM, Part 10. The ASME/ANSI OM, Part 10, Section 4.3.1, required that safety and relief valves shall meet the in-service test requirements of ASME/ANSI OM, Part 1. The ASME/ANSI OM, Part 1, Section 1.3.4.1(e)(1), required, in part, that additional valves shall be set pressure tested on the basis of two additional valves to be tested for each valve failure up to the total number of valves of the same type and manufacture. If any of the additional valves

tested exceeds the stamped set pressure criteria by three percent or greater, then all valves of the same type and manufacture shall be tested. The failure to test additional valves in accordance with ASME/ANSI OM, Part 1, was a violation of TS 4.2.a.2. However, this violation is associated with an inspection finding that is characterized by the Significance Determination Process as having very low risk significance (i.e., green) and is being treated as a Non-Cited Violation, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 50-305/2000008-03, Failure to Test Additional Relief Valves in Accordance with Technical Specifications). This violation is in the licensee's corrective action program as KAP WR 00-001179.

The inspectors used the SDP to evaluate the risk significance of this issue. The issue was of very low safety significance since any one train of AFW was capable of supplying the 100 percent decay heat requirements for the reactor plant.

1R23 Temporary Plant Modifications

a. Inspection Scope

On May 26, 2000, the licensee identified that the interlock permissive circuitry associated with two redundant RHR valves were routed such that single failure criteria were not met. Temporary Change Request 00-012, "Remove RHR Pressure Permissive from RHR-299A and RHR-299B" was initiated to remove the interlock from service on both valves thereby providing adequate separation. The inspectors reviewed the TCR, including the safety evaluation and drawings, appropriate sections of the USAR, KAP WO 99-003528-000, and attended the Plant Operations Review Committee meeting which evaluated and approved the TCR.

b. Findings

Discussion

Valves RHR-299A and RHR-299B were relied upon to establish an injection path from the low head injection RHR system to the high head safety injection system during long term sump recirculation. The licensee identified that a pressure permissive switch and its associated circuitry, which had been relied upon to prevent inadvertent opening of Valves RHR-299A and RHR-299B under pressure conditions which could over pressurize safety injection piping, could fail and result in not being able to open either valve when required. This single-failure problem was documented in KAP WO 99-003528-000. The inspectors attended the Plant Operations Review Committee meeting which approved the TCR for installation. Subsequently, the inspectors questioned the licensee regarding the reportability of this condition since USAR, Table 6.2-8(a), "Single Failure Analysis - Safety Injection System", reflected the design requirement that these valves meet the single failure criteria. Based on the inspectors' questions, the licensee subsequently made a one-hour, non-emergency report pursuant to 10 CFR 50.72(b)(ii)(B) for a condition which was outside the design basis of the plant. The licensee planned to submit an LER.

The inspectors used the SDP to evaluate the risk significance associated with the issue. The issue was of very low safety significance based on no actual loss of safety function of the system.

4. OTHER ACTIVITIES

OA1 Performance Indicator Verification

a. Inspection Scope

The inspectors reviewed the accuracy of the licensee's data submittal of the "Unplanned Power Changes per 7,000 Critical Hours" performance indicator. The inspectors verified the accuracy of the critical hours reported, reviewed reactor operator and shift supervisor logs, and reviewed recorder traces of key reactor plant parameters during past power transients.

b. Findings

There were no findings identified.

OA3 Event Follow-up

a. Inspection Scope

On June 6, 2000, at 11:10 p.m. the plant was manually tripped due to an abnormal temperature indication of the 'A' RCP radial bearing. The inspectors reviewed alarm printouts, emergency operating procedures, and abnormal operating procedures to verify proper operator and equipment response to the reactor trip. Specific procedures reviewed included ARP "47011-H, RXCP Radial Bearing Temp High", and Procedure A-RC-36C, "Abnormal Reactor Coolant Pump Operation," Revision M. The licensee planned to submit a licensee event report.

b. Findings

There were no findings identified.

OA4 Cross-Cutting Issues

Human Performance Problems

a. Inspection Scope

During the course of various inspections, the inspectors interviewed operators to evaluate their awareness of degraded control room indications and alarms and their ability to adequately take manual actions based on degraded alarm functions.

b. Findings

One example was identified regarding lack of control room staff awareness involving degraded control room instrumentation associated with a degraded RWST Level Low-Low Level alarm which actuated at nine percent instead of the normal four percent level. The inspectors noted that the alarm was utilized in the IPEOPs and an ARP during a design basis loss of coolant accident (see Section 1R15 of this report). The procedures required the control room operators to stop any operating pumps which were taking a suction from the RWST. This was done to prevent cavitation of the pumps and to prepare for initiating long term sump recirculation. The inspectors evaluated this condition as potentially confusing to the operators since the alarm instrument loop was not in calibration and would have actuated early during an accident scenario, therefore increasing the risk associated with initiating long term sump recirculation. Initiating long term sump recirculation had been evaluated by the licensee using risk analysis as one of the most important operator actions. This human performance cross-cutting issue was evaluated for overall risk significance as part of the review for operability evaluations. This human performance issue was determined to be of very low safety significance (no color).

OA6 Meetings, Including Exit

On June 22, 2000, the inspectors presented the inspection results to the assistant plant manager and members of his staff. 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

Wisconsin Public Service Corporation

D. Braun, Assistant Plant Manager - Operations
D. Cole, Manager, Assessments
K. Evers, Manager, Nuclear Support Services
K. Hoops, Plant Manager, Kewaunee Plant
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M. Marchi, Vice President - Nuclear
J. Mortonson, Assistant Plant Manager - Maintenance
M. Reinhart, Superintendent, Radiation Protection
J. Schweitzer, Manager, Engineering and Technical Support
J. Stoeger, Superintendent, Operations
T. Webb, Nuclear Licensing Director
K. Weinhauer, General Manager, Kewaunee Plant

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-305/20000-08-01	NCV	Failure to Initiate KAP and Document RWST Level Low-Low Alarm Inoperability
50-305/20000-08-02	NCV	Failure to Update Computer Alarm for Current Axial Flux Distribution Target Band
50-305/20000-08-03	NCV	Failure to Test Additional Relief Valves in Accordance with Technical Specifications

Closed

50-305/20000-08-01	NCV	Failure to Initiate KAP and Document RWST Level Low-Low Alarm Inoperability
50-305/20000-08-02	NCV	Failure to Update Computer Alarm for Current Axial Flux Distribution Target Band
50-305/20000-08-03	NCV	Failure to Test Additional Relief Valves in Accordance with Technical Specifications

Discussed

None

LIST OF BASELINE INSPECTIONS PERFORMED

The following inspectable area procedures were used to perform inspections during the report period. Documented findings are contained in the body of the report.

Inspection Procedure		Report Section
Number	Title	
71111.01	Adverse Weather	R01
71111.04	Equipment Alignments	R04
71111.05	Fire Protection	R05
71111.06	Flood Protection Measures	R06
71111.12	Maintenance Rule Implementation	R12
71111.13	Maintenance Risk Assessment and Emergent Work Evaluation	R13
71111.14	Personnel Performance During Non-routine Plant Evolution	R14
71111.15	Operability Evaluations	R15
71111.16	Operator Work-Arounds	R16
71111.19	Post Maintenance Testing	R19
71111.20	Refueling and Outage Activities	R20
71111.22	Surveillance Testing	R22
71111.23	Temporary Plant Modifications	R23
71151	Performance Indicator Verification	OA1
71153	Event Follow-up	OA3

LIST OF ACRONYMS USED

AFD	Axial Flux Distribution
AFW	Auxiliary Feedwater
ANSI	American National Standards Institute
ARP	Alarm Response Procedure
ASME	American Society for Mechanical Engineers
CFR	Code of Federal Regulations
DG	Diesel Generator
DRP	Division of Reactor Projects, Region III
FPP	Fire Plan Procedure
GNP	General Nuclear Procedure
IPEOP	Integrated Plant Emergency Operating Procedure
KAP	Kewaunee Assessment Process
LER	Licensee Event Report
MRFF	Maintenance Rule Function Failure
NCV	Non-cited Violation
NRC	Nuclear Regulatory Commission
OM	Operation and Management of Nuclear Power Plants
OWA	Operator Work Around
PARS	Publicly Available Records
PMP	Preventative Maintenance Procedure
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RWST	Refueling Water Storage Tank
SDP	Significance Determination Process
SP	Surveillance Procedure
SW	Service Water
TCR	Temporary Change Request
TS	Technical Specification
USAR	Updated Safety Analysis Report
WO	Work Order
WR	Work Request