May 22, 2000

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

SUBJECT: NRC SUPPLEMENTAL EMERGENCY PREPAREDNESS INSPECTION REPORT 50-305/2000006(DRS)

Dear Mr. Marchi:

On April 5, 2000, the NRC completed a supplemental inspection at your Kewaunee Nuclear Power Plant. The results of this inspection were discussed on April 5, 2000, with Mr. K. Hoops and other members of your staff. The enclosed report presents the results of this inspection.

The inspection focused on the performance of the Alert and Notification System (ANS) in the Kewaunee County portion of the Kewaunee Plant's Emergency Planning Zone, and was prompted by the results of your performance indicator (PI) for the ANS for the 12 month period ending on December 31, 1999. The PI was classified as "Yellow" in accordance with the criteria of NRC's revised reactor oversight process. This classification represents performance that reduces safety margin and requires enhanced NRC oversight. The PI was based on the results of bimonthly system activation tests. The PI indicated that one or more sirens of the ANS did not function as required in more than 10 percent of the bimonthly test opportunities. Your quarterly computed ANS failure rate for this 12 month period ranged from 11.2 to 13.3 percent.

Based on the results of this inspection, we identified problems with the adequacy of your assessment and extent of condition evaluation for this degraded cornerstone condition, and the scope and timeliness of your actions to address the overall ANS performance problems.

Your staff recognized a series of individual siren performance problems since 1998. In mid-1999, your staff had assessed the primary problems as electronic component aging and the unavailability of replacement parts. Our inspection, however, found that your staff had not completed a comprehensive assessment to identify all root causes and other contributing factors. For example, we identified that management oversight of the ANS was not sufficient, and also identified problems with your maintenance and quality programs relating to this system. Collectively, these problems indicate that your ANS performance program lacked sufficient structure and was not given the necessary level of management attention. While your staff recently replaced the ANS electronics and computer software with upgraded components, which is expected to significantly improve system performance, corrective actions taken to date have not addressed the full extent of the problem.

Consistent with the NRC's Action Matrix for a "Yellow" performance indicator as provided under our revised reactor oversight process, we plan to meet with you to discuss ANS performance through March 2000, the results of this supplemental inspection, and your actions in response to these findings. We are also concerned that ANS performance as reflected by your recent PI submittal for the first quarter of 2000 continues to decline. A member of my staff will contact you to schedule this meeting. The deficiencies with your root cause assessment and corrective actions for the ANS performance problem will be evaluated as part of our annual focused problem identification and resolution inspection.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Electronic Reading Room (PERR) link at the NRC homepage, http://www.nrc.gov/NRC/ADAMS/index.html.

We will gladly discuss any question you have concerning this inspection.

Sincerely,

/RA/

J. E. Dyer
Regional Administrator

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

Enclosure: Inspection Report 50-305/2000006(DRS)

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
W. Curtis, FEMA, Region V

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State Liaison Officer
W. Curtis, FEMA, Region V

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-305
License No:	DPR-43
Report No:	50-305/2000006(DRS)
Licensee:	Wisconsin Public Service Corporation
Facility:	Kewaunee Nuclear Power Plant
Location:	RR#1, Post Office Box 999 Kewaunee WI 54216-9511
Dates:	April 4-5, 2000
Inspectors:	T. Ploski, Senior Emergency Preparedness Inspector R. Winter, Reactor Engineer
Approved by:	W. Slawinski, Acting Chief, Plant Support Branch Division of Reactor Safety

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 PERFORMANCE INDICATOR AND INSPECTION FINDINGS

Kewaunee Nuclear Power Plant
NRC Inspection Report 50-305/2000006(DRS)

Cornerstone: Emergency Preparedness (EP)

This report covers an announced, two day supplemental EP inspection by two regional inspectors. This supplemental inspection was performed in accordance with NRC Inspection Procedure 95002, to assess the causes and the licensee's evaluation of the "Yellow" Performance Indicator associated with the Alert and Notification System (ANS) in the Kewaunee County portion of the Kewaunee Plant's Emergency Planning Zone.

Performance Indicator

Based on the results of bimonthly tests of the ANS in Kewaunee County, the computed Performance Indicator for the 12 month period ending on December 31, 1999, was characterized as "Yellow" in accordance with the criteria of NRC's revised reactor oversight program. This level of performance means that one or more sirens did not function as expected during at least 10 percent of the bimonthly test opportunities. The 1999 quarterly Performance Indicator values ranged from 86.7 to 88.8 percent.

Inspection Findings

The inspectors determined that the licensee assessed the primary root cause of ANS performance problems to be aging electronics equipment and related software. Replacement electronics and software were ordered in mid-1999 and installed in February 2000. The inspectors concluded, however, that the licensee's assessment was not sufficiently comprehensive to identify the full scope of problems associated with the ANS performance program. As a result, licensee corrective actions generally were focused on the equipment problem rather than all root causes and contributing factors. For example, the inspectors identified that: (1) management oversight of the ANS performance program was limited; (2) an audit failed to identify degrading ANS performance as a concern; (3) annual preventive maintenance was not consistently performed on the system; (4) the corrective action program was not used consistently to document ANS problems; and (5) maintenance procedures and records were deficient. Collectively, these problems indicate that the ANS performance program lacked sufficient structure and oversight.

The deficiencies with your root cause and extent of condition evaluation and the associated corrective actions will be evaluated as part of our annual focused problem identification and resolution inspection. The NRC will continue to evaluate ANS Performance under the guidelines of the Revised Reactor Oversight Process Action Matrix.

Report Details

REACTOR SAFETY

Cornerstone: Emergency Preparedness (EP)

4 OTHER ACTIVITIES (OA)

4OA4 Other

.1 Inspection Scope

This supplemental inspection was performed by the NRC to assess the licensee's evaluation of a degraded EP cornerstone (a Yellow Performance Indicator (PI)) for the performance of the Alert and Notification System (ANS) in the Kewaunee County portion of the Kewaunee Plant's Emergency Planning Zone (EPZ). The supplemental inspection was performed in accordance with Inspection Procedure 95002.

.2 Performance Indicator Summary

Kewaunee County's ANS consisted of 13 fixed sirens mounted on poles, plus related hardware and software used to activate these sirens and to monitor and automatically record each siren's performance. Kewaunee County officials scheduled and conducted bimonthly ANS activation tests. The licensee used the results of these bimonthly tests to compute quarterly PI data.

The ANS performance in Kewaunee County was characterized as "Yellow" per the criteria of the NRC revised reactor oversight program. This level of performance indicates that, during the 12 month period ending on December 31, 1999, one or more sirens did not function as expected in at least 10 percent of their bimonthly test opportunities. The licensee's quarterly computed siren failure rate for this 12 month period ranged from 11.2 to 13.3 percent.

.3 Evaluation of Inspection Requirements

a. Problem Identification

During 1998 and 1999, licensee EP staff identified increasing indications of degrading ANS performance within the Kewaunee County portion of the plant's EPZ, based on the results of bimonthly ANS tests performed by county officials and ANS maintenance technicians' feedback. Technicians from Wisconsin Public Service Corporation's Transmission and Substation Group were responsible for ANS maintenance in Kewaunee and adjacent Manitowoc Counties. Licensee EP staff stated that maintenance technicians' feedback included concerns on spare parts availability and aging ANS electronic components.

Kewaunee County officials conducted ANS operability tests on the first and third Wednesday of each month. The first Wednesday tests were "complete cycle tests" that

generally involved sounding the sirens for about a minute. The third Wednesday tests were shorter duration "growl tests." Licensee EP staff compiled and informally assessed these automatically recorded test results supplied by county officials in a cooperative effort to provide Wisconsin Division of Emergency Government (WDEG) staff with ANS performance data. The performance data was included in the WDEG's annual letter of certification to the Federal Emergency Management Agency (FEMA) per the requirements of 44 Code of Federal Regulations (CFR) Part 350.

Licensee EP staff also stated that they began to lose confidence in the accuracy of siren performance feedback that was automatically transmitted and recorded by ANS components because component reliability was suspect. As a result, between August 1998 and August 1999 the licensee deployed several staff to perform visual and audio assessments of up to three sirens' performance during the "complete cycle tests". Assessment results were recorded on "Siren Field Observation Report" forms, which were an attachment to Emergency Preparedness Maintenance Procedure (EPMP) 9.3. The inspectors' review of these completed forms indicated that occasional problems identified by the observers appeared to be electrical and/or mechanical in nature.

In accordance with the requirements of 10 CFR 50.54(t), the licensee's Quality Programs (QP) staff conducted an annual review of the licensee's EP program that included an assessment of the adequacy of the licensee's interfaces with State and local governments. The inspectors' review of the 1999 audit summary report and discussions with the cognizant auditor indicated that QP staff had not identified ANS performance as a concern.

Based on a review of bimonthly ANS test results, Kewaunee Assessment Process (KAP) forms, completed "Siren Field Observation Report" forms, and discussions with cognizant EP and QP staff, the inspectors agreed with the licensee's evaluation that ANS performance had degraded during 1998 and 1999.

b. Root Cause and Extent of Condition Evaluation

Licensee EP staff did not use a systematic root cause analysis technique to evaluate the 1998-1999 ANS performance problems. Instead, the EP staff informally assessed the automatically recorded results of the bimonthly siren tests they obtained from county officials, feedback from maintenance technicians, and completed "Siren Field Observation Report" forms. These factors led to the EP staff's conclusion that the apparent root cause of the bulk of ANS problems was age-related degradation of ANS electronics components and software.

The inspectors concluded that the licensee's root cause evaluation was not conducted to a sufficient level of detail. Consequently, the full scope of the problems associated with the ANS performance program were not identified by the licensee. Based on the results of this inspection, the inspectors concluded that plant management involvement in the ANS performance program was not sufficient, which was another root cause for the ANS performance problems. The inspectors found that oversight of the ANS program was generally provided at the EP staff supervisory level, even though ANS performance was known or suspected to be degrading since 1998. The inspectors also identified several contributing causes to the performance problems and noted that: (1)

preventive maintenance on ANS equipment was not conducted in 1999; (2) the QP staff's 1999 audit failed to identify ANS performance as a concern; (3) the licensee staff did not consistently use the KAP process to document ANS problems; (4) maintenance records were typically not maintained to allow equipment problems to be trended and assessed; and (5) procedures contained inadequate guidance to assure maintenance was performed, results recorded and that maintenance records were reviewed. Consequently, the inspectors concluded that the overall ANS performance program lacked necessary guidance, structure and management oversight.

Regarding the EP staff's inconsistent use of the KAP, the inspectors reviewed relevant KAP forms generated between July 1999 and March 2000. The inspectors determined that the KAP was not consistently used to document individual ANS performance concerns and related corrective actions; although, two overall system failures were documented on KAP forms. Specifically, the inspectors concluded that licensee staff effectively used the KAP process to assess and document the two instances of the failures of all 13 sirens to perform as expected, which satisfied procedural criteria for making one hour, non-emergency event reports to the NRC Headquarters Operations Center in accordance with 10 CFR 50.72(b)(v). The licensee correctly determined that over 50 percent of the resident population in the entire EPZ would be affected by the inability of the 13 sirens in the Kewaunee County portion of the EPZ to sound their warning signal. The inspectors' review of these KAP forms and their attachments indicated that these non-emergency event reports were made in a timely and acceptably detailed manner.

The inspectors found that station procedures did not require that ANS preventive maintenance be performed, nor did the licensee's Emergency Plan address ANS maintenance. During the course of this supplemental inspection, EP staff discovered that preventive maintenance was not done during 1999. The EP staff concluded that the technicians decided to delay their planned preventive maintenance visit to each siren site until fall 1999, when they were also to replace electronics components. When delivery of the new electronics was delayed, the 1999 preventive maintenance activities did not occur.

The inspectors concluded that the licensee did not fully evaluate the extent of condition for the ANS performance problems. In discussions with EP staff, their view was that the problems and causes were not applicable to plant equipment or systems, obviating the need for a complete condition assessment.

c. Corrective Action

Based on records review and discussions with cognizant licensee staff, the inspectors determined that the licensee's ANS hardware and software corrective actions were acceptable and addressed the age-related degradation of the equipment. By mid-1999, the licensee concluded that new ANS electronics components and/or related software should be installed at each siren site, the Kewaunee County EOC, and the Kewaunee County Sheriff's Office. In cooperation with Kewaunee County, Manitowoc County, and Point Beach Plant staffs, a prudent decision was made to upgrade the ANS electronics and software installed in both counties. The licensee stated that delivery of the upgraded ANS electronics and software had been delayed in fall 1999 due to software

development and scheduling. The licensee considered the system upgrades to be completely installed and operational at the end of February 2000.

Equipment upgrades also included the licensee's capability to use a computer to monitor county officials' activation of the 13 sirens and to display bimonthly tests' results. Additionally, the technicians had the capability to use a laptop computer at a siren site to interrogate electronics components.

The inspectors observed an example of the licensee's assessment and corrective action capabilities during a monthly ANS "complete cycle test" conducted on April 5, 2000. One inspector observed county officials conducting the test at Kewaunee County's EOC in Algoma, Wisconsin. The other inspector observed the test at the EP Process Leader's office, where he monitored the county officials' actions using a computer linked to the county officials' computer. Automatic feedback from each siren site indicated that all but one siren sounded as expected, which the licensee promptly investigated and identified as a probable programming error in the new software used to assess and record each siren's performance. This problem was still being addressed at the end of the inspection.

Station management acknowledged that additional corrective actions were needed to address problems other than equipment hardware and software, and the licensee was considering procedural revisions, formalizing the maintenance program, maintenance technician training and development of troubleshooting guides. These corrective actions were expected to be completed in spring 2000. Station management also acknowledged that prior problems with the identification of issues and their entry into the KAP existed. The licensee informed the inspectors that corrective actions had been previously initiated and were ongoing to address generic problems with the implementation of its KAP program. The licensee indicated that QP staff's year 2000 audit plans for the EP program were being developed.

4OA5 Management Meetings

.1 Exit Meeting Summary

The inspector presented the inspection results to Mr. K. Hoops and other members of licensee management and staff at the conclusion of the inspection on April 5, 2000. The licensee acknowledged the information presented and did not identify any information discussed as proprietary.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Ferris, Licensing Specialist
D. Heironimus, Quality Programs Auditor
K. Hoops, Plant Manager
J. Riste, Licensing Supervisor
D. Seebart, Emergency Preparedness Process Leader
L. Sutton, Analyst

Kewaunee County Emergency Government

L. Hucek, Emergency Government Director

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None.

Closed

None.

Discussed

None.

INSPECTION PROCEDURES USED

IP 95002, (4/3/2000) "Inspection for One Degraded Cornerstone or any Three White Inputs in a Strategic Performance Area"

LIST OF ACRONYMS USED

ANS	Alert and Notification System
CFR	Code of Federal Regulations
DRS	Division of Reactor Safety
EOC	Emergency Operations Center
EP	Emergency Preparedness
EPMP	Emergency Preparedness Maintenance Procedure
EPZ	Emergency Planning Zone
FEMA	Federal Emergency Management Agency
GNP	General Nuclear Procedure
KAP	Kewaunee Assessment Process
NAD	Nuclear Administrative Directive
NRC	Nuclear Regulatory Commission
OA	Other Activities
PERR	(NRC) Public Electronic Reading Room
PI	Performance Indicator
QP	Quality Programs
WDEG	Wisconsin Division Of Emergency Government

LIST OF DOCUMENTS REVIEWED

Licensee Audits

"Kewaunee Nuclear Power Plant Quality Programs Audit Report - Third Quarter 1999", dated November 17, 1999
"Kewaunee Nuclear Power Plant Quality Programs Audit Report - Fourth Quarter 1999", dated February 10, 2000

Miscellaneous

Kewaunee Nuclear Power Plant Emergency Plan, Revision 19, Section 6.8.3
"Siren Field Observation Report" forms completed during the period August 1998 through August 1999
Siren System Status Summary printouts for the periods April 1-11, 1999, and January 3-9, 2000
Siren Troubleshooting Guide, dated 1991
Letter, dated January 5, 2000, to the Wisconsin Emergency Management Agency: "Transmittal of Required Siren Test Data for 1999"
Letter, dated February 15, 2000, to the FEMA Region V Regional Director: "Annual Letter of Certification on Wisconsin's Compliance with Items in 44 CFR 350 and NUREG-0654"
Federal Commander Digital Telemetry System SFCDware Software Reference Manual
Compulert Remote Site Controller Manual
"Summary of Federal Signal and Point Beach Nuclear Plant and Kewaunee Nuclear Power Plant Siren Project Issues," dated March 17, 2000

Kewaunee Assessment Process Forms

3303, 3653, 3718, 00-000011, 00-000366, 00-000777

Licensee Procedures

EPMP 9.3, Revision F, dated March 31, 1998: "Alert and Notification Siren System Testing and Maintenance"
EPMP 9.3, draft Revision G, undated: "Alert and Notification Siren System Testing and Maintenance"
GNP-11.8.1, Revision B: "Kewaunee Assessment Process"
GNP-11.8.4, Revision A: "Reportability Determinations"
NAD-11.8, Revision C: "Kewaunee Assessment Process"