

December 23, 2003

Mr. Thomas Coutu
Site Vice President
Kewaunee Nuclear Plant
Nuclear Management Company, LLC
N490 Hwy 42
Kewaunee, WI 54216-9511

SUBJECT: KEWAUNEE NUCLEAR POWER PLANT - NRC SUPPLEMENTAL
INSPECTION REPORT 05000305/2003003(DRS)

Dear Mr. Coutu:

On December 5, 2003, the NRC completed a supplemental inspection at your Kewaunee Nuclear Power Plant regarding a White inspection finding. This White finding involved the lack of a fire suppression system in Fire Zone TU-95B. The enclosed report presents the results of that inspection which were discussed on December 5, 2003, with members of your staff.

The NRC previously performed this supplemental inspection as required by the NRC Action Matrix based on plant performance for Kewaunee Nuclear Power Plant being within the Regulatory Response column of the NRC Action Matrix due to one White finding in the Mitigating Systems cornerstone. The inspection could not be completed at the time, because the root cause, extent of condition evaluation, and corrective actions were not yet fully developed. Because of this, the White finding remained open pending the completion of the inspection.

Based on the results of this follow-up inspection, the inspector determined that an adequate root cause evaluation had been completed. Given the acceptable performance in addressing the lack of a fixed fire suppression system in Fire Zone TU-95B, the White finding will only be considered in assessing plant performance using the NRC Action Matrix through the end of the fourth quarter 2003.

This supplemental 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 these areas, the inspection consisted of a selected examination of procedures and representative records, and interviews with personnel. Specifically, this inspection focused on your assessment of the root causes and corrective actions associated with the White inspection finding.

Based upon the results of this inspection, no findings of significance were identified.

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/reading-rm/adams.html> (the Public Electronic Reading Room).

T. Coutu

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

Sincerely,

/RA by George Hausman Acting for/

Julio F. Lara, Chief
Electrical Engineering Branch
Division of Reactor Safety

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

Enclosure: Kewaunee Supplemental Inspection
Report 05000305/2003003(DRS)

cc w/encl: D. Graham, Director, Bureau of Field Operations
Chairman, Wisconsin Public Service Commission
State Liaison Officer

T. Coutu

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000305/2003003(DRS)

Licensee: Nuclear Management Company, LLC

Facility: Kewaunee Nuclear Power Plant

Location: Box 999
N 490 Highway 42
Kewaunee, WI 54216-9511

Dates: December 1 through 5, 2003

Inspectors: R. Daley, Reactor Engineer
Electrical Engineering Branch

Approved By: Julio Lara, Chief
Electrical Engineering Branch
Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000305/2003003(DRS); 12/01/2003 - 12/05/2003; Kewaunee Nuclear Power Plant; Supplemental Inspection - Mitigating Systems Cornerstone.

This supplemental inspection was performed by a regional inspector. No findings of significance were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3 dated July 2000.

A. Inspector Identified Findings

Cornerstone: Mitigating Systems

- White. The U. S. Nuclear Regulatory Commission (NRC) performed this supplemental inspection to assess the licensee's root cause evaluation, extent of condition determination, and corrective actions for the lack of a fixed fire suppression system in Fire Zone TU-95B. This performance issue was previously characterized as having low to moderate safety significance (i.e., White) in an NRC letter dated December 2, 2002, which communicated the final significance determination of the finding documented in NRC Inspection Report 50-305/02-06(DRS). During this supplemental inspection, performed in accordance with Inspection Procedure 95001, the inspector concluded that the licensee had developed a comprehensive root cause evaluation and completed a corrective action plan to address this issue as well as other potential 10 CFR Part 50, Appendix R, concerns.

Given the licensee's acceptable performance in addressing the fire suppression issue for Fire Zone TU-95B, the White finding associated with this issue will only be considered in assessing plant performance using the NRC Action Matrix through the end of the fourth quarter 2003.

B. Licensee-Identified Violations

None.

REPORT DETAILS

01 INSPECTION SCOPE

The U.S. Nuclear Regulatory Commission (NRC) performed this supplemental inspection to assess the licensee's evaluation associated with the absence of a fire suppression system in Fire Zone TU-95B. This performance issue was previously characterized as "White" in NRC Inspection Report 50-305/02-06(DRS) and is related to the mitigating system cornerstone in the reactor safety strategic performance area.

02 EVALUATION OF INSPECTION REQUIREMENTS

02.01 Problem Identification

- a. Determine that the evaluation identifies who (i.e., licensee, self-revealing, or NRC), and under what conditions the issue was identified.

As a follow-up to issues raised by the NRC during the triennial Fire Protection Inspection in 2001 (January 29 through February 16, 2001) in regard to Fire Zone TU-95B, the licensee reviewed the 10 CFR Part 50, Appendix R, compliance of features in this zone. As a result of this review, the licensee determined that the Fire Zone TU-95B was classified as an area in compliance with 10 CFR Part 50, Appendix R, Section III.G.2. However, in October 2002, the licensee determined that Fire Zone TU-95B was actually in compliance with the requirements in Section III.G.3. As such, the area was required to have a fixed suppression system. Since no fixed suppression system existed in Fire Zone TU-95B, Kewaunee Nuclear Power Plant (KNPP) determined that this was not in accordance with the requirements of 10 CFR Part 50, Appendix R, Section III.G.3. The inspector also reviewed the applicable KNPP license basis documents and agreed that this area was originally classified as a Section III.G.3 area.

The inspector determined that the licensee appropriately identified who and under what conditions the issue was identified.

- b. Determine that the evaluation documents how long the issue existed, and prior opportunities for identification.

The licensee determined that even though KNPP considered Fire Zone TU-95 as a Section III.G.2 area, it was in fact a Section III.G.3 area. They also concluded that their license basis supported that no fixed suppression system was required in Fire Zone TU-95B. A large amount of correspondence exists between the licensee and the NRC staff between 1977 and 1987, discussing the Kewaunee Fire Protection Program and 10 CFR Part 50, Appendix R, modifications. The inspector could find no correspondence from the licensee that specifically stated that there was and would be no fixed suppression system in Fire Zone TU-95B, nor could the inspector find any correspondence from the NRC staff that specifically acknowledged that there was no fixed suppression system in this area.

Consequently, this issue has existed since the Kewaunee plant originally determined that they were in compliance with 10 CFR Part 50, Appendix R. In their root cause evaluation for this issue, the licensee was primarily concerned with the reasons for lack of understanding of the KNPP licensing basis. Since KNPP determined that the majority of problems associated with this issue were knowledge based, it is uncertain whether previous staff could have appropriately identified the issue if the opportunity existed. Therefore, it is uncertain if there were any genuine prior opportunities for identification of this issue.

- c. Determine that the evaluation documents the plant specific risk consequences (as applicable) and compliance concerns associated with the issue.

This issue was classified as a "White" finding (i.e., a finding of low to moderate safety significance). In response to the Notice of Violation issued by the NRC, the licensee acknowledged the violation in a letter dated January 2, 2003. The Root Cause evaluation (RCE 000608, Revision 1) also documents that the finding associated with this issue was a "White" finding.

The licensee installed a suppression system in Fire Zone TU-95B. KNPP determined that the reduction in risk gained from the installation of this suppression system was 9.242 E-6 . In RCE 000608, the licensee concluded that based upon the risk benefit gained, the installation of a suppression system in TU-95B was warranted. Based upon the licensee's actions, the inspector concluded that the licensee appropriately addressed the risk consequences and compliance concerns associated with the issue.

02.02 Root Cause and Extent of Condition Evaluation

- a. Determine that the problem was evaluated using a systematic method(s) to identify root cause(s) and contributing cause(s).

In RCE 000608, the licensee used both a Failure Modes Analysis and Barrier Analysis to evaluate this issue. In their root cause evaluation, the licensee determined that during and after the NRC Fire Protection Triennial Inspection, the KNPP staff mis-classified Fire Zone TU-95B as a Section III.G.2 area as opposed to a Section III.G.3 area. They also concluded that their license basis supported that no fixed suppression system was required in Fire Zone TU-95B. Because of these conclusions, the licensee focused their root cause evaluation on the reasons for this misunderstanding of the plant's license basis in regard to 10 CFR Part 50, Appendix R.

While the inspector agreed that the license basis did appear to support that Fire Zone TU-95B was a Section III.G.3 area, he could not find any correspondence from the licensee that specifically stated that there was and would be no fixed suppression system in Fire Zone TU-95B, and he could not find any correspondence from the NRC staff that specifically acknowledges that there is no fixed suppression system in this area. Consequently, the inspector could not reach the conclusion that the NRC staff specifically approved that no fixed suppression system was required for Fire Area TU-95B.

However, since the issues that were addressed in the root cause evaluation were human performance issues and knowledge-based issues, the inspector determined that the root cause was still focusing in the correct area, because the reasons for the lack of a suppression system in this area were similar.

In RCE 000608, the licensee used both a Failure Modes Analysis and Barrier Analysis to evaluate these human performance issues. Based upon the scope of the root cause report, the inspector determined that the methods used to evaluate the root and contributing causes were adequate.

- b. Determine that the root cause evaluation was conducted to a level of detail commensurate with the significance of the problem.

As stated in Section 02.02.a., the root cause evaluation concentrated on human performance issues. In the Failure Mode Analysis, the licensee identified several failure modes that contributed to this issue. The most pertinent item identified was Inadequate Program Management which led to Inadequate Prioritization, Inadequate Planning, and Inadequate Staffing in the Fire Protection area. Because of a lack of knowledgeable staff and an organized, comprehensive, retrievable baseline 10 CFR Part 50, Appendix R, document to identify the historical KNPP licensing basis, the licensee could not accurately identify the true requirements for Fire Zone TU-95B. The licensee determined that problems have existed in the Appendix R program, because KNPP had typically relied upon the skills of a single, part-time person contracted to fulfill the responsibilities of an Appendix R Engineer. Because KNPP relied upon information provided by this individual, decisions made in relation to the Fire Protection Program were vulnerable to errors, because reviewers and management were overly dependent on this individual's knowledge. Since the site was lacking qualified staff and did not have clear 10 CFR Part 50, Appendix R, baseline documents, knowledge-based errors were inevitable. The licensee concluded that this problem was a result of Inadequate Program Management. They believed that had the program been managed effectively, the proper staff and baseline 10 CFR Part 50, Appendix R, documents would have been available to determine the correct license and design basis for Fire Zone TU-95B and other areas in the plant.

The inspector concluded that the root cause evaluation was sufficiently self-critical and explored the human performance issues that contributed to this issue.

- c. Determine that the root cause evaluation included a consideration of prior occurrences of the problem and knowledge of prior operating experience.

The root cause evaluation has a dedicated section entitled, "Previous Event Review." This section considered both prior occurrences and operating experience. As a result of this review, the licensee concluded that, "the majority of problems currently affecting the fire protection program have been previously identified . . . Design and licensing bases documents need to be updated and/or revised to reflect requirements. Prioritization, planning, and scheduling need improvement, as well as overall program management. All of these items have been identified within the last two years of assessments and evaluations. These items have been pulled together in the Fire Protection Program Improvement Plan, of which Phase I is currently funded for 2003."

KNPP determined that the reasons why there have been persistent problems with the fire protection program was related to the issues discussed in Section 02.02.b of this report. In this regard, the research in regard to operating experience contributed to the conclusions drawn in the overall root cause analysis report.

Additionally, the licensee performed a search of the INPO database and found two related Operating Experience events. The information did not appear to be exactly pertinent to the issues involved in this root cause report.

- d. Determine that the root cause evaluation addresses the extent of condition and the extent of cause of the problem.

The licensee did perform the extent of condition reviews. In connection with these reviews, KNPP recognized that without a clear statement of licensing basis, decisions affecting all fire zones could be questionable. Because of this, the licensee has been performing a baseline of their Fire Protection Program and license basis in regard to 10 CFR Part 50, Appendix R, to address this extent of condition issue.

The licensee also decided that since TU-95B had redundant circuits in the same area, it would be beneficial to review safe shutdown related circuits in the plant. The circuits of concerns consisted of cabling to the Dedicated Shutdown Panel that had not originally been identified and analyzed within the Appendix R Design Description document. Based upon this, KNPP determined that a formal review of these remaining circuits should be performed and documented. This evaluation was still in progress during this inspection.

02.03 Corrective Actions

- a. Determine that appropriate corrective action(s) are specified for each root/contributing cause or that there is an evaluation that no actions are necessary.

The corrective actions appear to be appropriate for the major items addressed in the root cause evaluation. The root causes, as listed in RCE 000608, were the following:

1. Inadequate Program Management - The manager was focusing on the individual response rather than overall program health.
2. Inadequate Accountability - The Fire Protection group has not been held accountable for overall improvement.

Contributing causes were as follows:

1. Overconfidence; and
2. Mindset/Preconceived Idea.

The contributing causes were essentially human performance issues. While the licensee developed the contributing causes based upon the KNPP staff's misconception that the area was a Section III.G.2 area instead of a Section III.G.3 area, the reasons for

the failure to properly identify whether a suppression system was required would be essentially the same, and were also clearly knowledge based.

To address the first root cause, which was essentially a staffing issue, KNPP hired an Appendix R Engineer and a new Program Owner. The licensee also has begun using an oversight group (the Plant Health Committee) to review, and hold accountable for completion, planned improvement steps to the program. The licensee considered that this action helped to address both root causes and the first contributing cause. In regard to the Fire Protection Program, the licensee had established a corrective action to create a baseline document of the fire protection program licensing requirements for KNPP. The licensee concluded that this baseline document would address contributing cause No. 2 by providing a barrier to help prevent these type of knowledge based errors.

The licensee addressed the lack of a suppression system in Fire Zone TU-95B by installing a new fire suppression system.

- b. Determine that the corrective actions have been prioritized with consideration of the risk significance and regulatory compliance.

While specific risk information was not used in prioritizing the corrective actions, it appears that the licensee scheduled and performed the corrective actions in a logical manner based upon overall plant vulnerability. Staffing concerns were addressed first. This is important, because without the proper staff, adequate performance of other corrective actions cannot be assured. Corrective actions that addressed the root causes and contributing causes were prioritized higher than corrective actions not directly associated with the root and contributing causes. At the time of this inspection, the licensee had already installed a water suppression system in Fire Zone TU-95B. Additionally, since these issues involve 10 CFR Part 50, Appendix R, compliance, it is implicit that regulatory compliance was considered during both development and prioritization of corrective actions.

- c. Determine that a schedule has been established for implementing and completing the corrective actions.

All corrective actions to address the root and contributing causes for this issue were complete. Based upon review of the root cause evaluation, the corrective actions were properly tracked. The actions were appropriately assigned to individuals responsible for the Fire Protection Program.

- d. Determine that quantitative or qualitative measures of success have been developed for determining the effectiveness of the corrective actions to prevent recurrence.

Effectiveness reviews were established by the licensee to evaluate the corrective actions associated with the root causes and contributing causes that were complete and to assess their success. These reviews were performed by the Engineering Programs Manager at KNPP. The effectiveness reviews were complete when this supplemental inspection was performed.

03 MANAGEMENT MEETINGS

Exit Meeting Summary

On December 5, 2003, the inspector presented the inspection results to Mr. K. A. Hoops and other members of licensee management. The licensee acknowledged the issues presented.

The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

K. Peveler, Programs Manager
J. Pollock, Long-Term Programs Manager
J. Lang, Appendix R Engineer/Fire Protection NMC Fleet Lead

NRC

R. Krsek, Senior Resident Inspector

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety but rather that selected sections of portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

Condition Reports Initiated as a Result of Inspection

CAP015066; Extent of Condition Evaluation RCE000057 Answered the Wrong Question; dated March 4, 2003

CAP015069; Inadequate Root Cause Evaluation, RCE000057; dated March 5, 2003

CAP015212; Investigate Why NRC Supplemental Inspection Could Not Be Completed; dated March 12, 2003

Documents Reviewed During Inspection

CAP002319; Determine Whether AFW Pump 1B is Section III.G.2 or Section III.G.3 per 10 CFR Part 50, Appendix R; dated March 30, 2001

EFR011868; Effectiveness Review - Inadequate Root Cause Evaluation RCE000057 - Verify Licensing Document in place; dated May 23, 2003

EFR011869; Effectiveness Review - Inadequate Root Cause Evaluation, RCE000057 - LER Supplement; dated May 23, 2003

EFR012288; Effectiveness Review - Ensure Oversight Group (Plant Health Committee) Holds Accountability; dated June 22, 2003

Letter from WPS to NRC; Submittal to Nuclear Regulatory Commission on 10 CFR Part 50, Appendix R Requirements; dated April 9, 1981

Letter from WPS to NRC; 10 CFR Part 50, Appendix R Implementation Schedule; dated August 4, 1982

Letter from NRC to WPS; Staff Position Regarding Interim 10 CFR Part 50, Appendix R Shutdown Capability; dated December 7, 1983

Letter from WPS to NRC; 10 CFR Part 50, Appendix R Extension Request; dated January 25, 1984

RCE 000057; 10 CFR Part 50, Appendix R Requirements Not Met in Fire Zone TU-95B; dated May 17, 2002

RCE 000608; 10 CFR Part 50, Appendix R Requirements Not Met in Fire Zone Tu-95B; dated March 19, 2002

SER for Amendment No. 23; Summary of 10 CFR Part 50, Appendix R Modifications and Incomplete Items; dated December 12, 1978

SER; 10 CFR 50.48 and 10 CFR Part 50, Appendix R Items Section III.G.3 and Section III.L Concerning Fire Protection of Safe Shutdown Capability; dated December 22, 1981

SER; Exemption to the Scheduling Requirements for the Alternate Shutdown System as Set Forth in 10 CFR 50.48(c)(4); dated February 29, 1984

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
DRS	Division of Reactor Safety
KNPP	Kewaunee Nuclear Power Plant
INPO	Institute of Nuclear Power Operations
IR	Inspection Report
NRC	Nuclear Regulatory Commission
NMC	Nuclear Management Company, LLC
RCE	Root Cause Evaluation
SER	Safety Evaluation Report