October 30, 2002

EA-02-204

Mr. T. Coutu
Site Vice President
Kewaunee Nuclear Power Plant
N490 Hwy 42
Kewaunee, WI 54216

SUBJECT: KEWAUNEE NUCLEAR POWER PLANT
USNRC INSPECTION REPORT 50-305/02-06(DRS) AND PRELIMINARY WHITE FINDING

Dear Mr. Coutu:

On August 2, 2002, the U.S. Nuclear Regulatory Commission (USNRC) discussed the preliminary results of a fire protection follow-up inspection at the Kewaunee Nuclear Power Plant with Mr. Hoefert and other members of your staff. The inspection was completed when the final results were subsequently discussed by telephone with you and a member of your staff on October 1, 2002. The enclosed report presents the results of that inspection.

The inspection was conducted as a follow-up to several issues identified during and as a result of a previous USNRC fire protection inspection (Inspection Report 50-305/01-02(DRS)). The inspection examined activities conducted under your license as they relate to safety and to compliance with the Commission's rules and regulations and with the conditions of your license. The inspection consisted of a selected examination of design drawings, calculations, analyses, procedures, audits, field walkdowns, and interviews with personnel.

Based on the results of this inspection, an issue that appears to have low to moderate safety significance was identified. As described in Section 1R05.1 of this report, fire area TU-95B lacked a fixed fire suppression system as required by 10 CFR Part 50, Appendix R, Section III.G.3. Using the applicable significance determination process, this issue was assessed as a potentially safety significant finding that was preliminarily determined to be White, an issue with low to moderate safety significance that may result in additional USNRC inspection. This issue is of apparent low to moderate safety significance because there is a greater likelihood that a fire in fire area TU-95B would not be suppressed and redundant trains of cables and equipment required for safety shutdown could be damaged. The corresponding damage could require a shutdown of the plant from outside the control room, thereby significantly increasing the complexity of manual actions required to achieve safe shutdown.

The failure to provide a fixed fire suppression system is an apparent violation of USNRC requirements and is being considered for escalated enforcement action in accordance with the "General Statement of Policy and Procedure for USNRC Enforcement Actions" (Enforcement Policy), NUREG-1600. The current Enforcement Policy is included on the USNRC's website at http://www.nrc.gov/what-we-do/regulatory/enforcement.html.

We believe that sufficient information was considered to make a preliminary significance determination. However, before we make a final decision on this matter, we are providing you an opportunity to present to the NRC your perspective on the facts and assumptions, used by the NRC to arrive at the finding and its significance, at a Regulatory Conference or through the submittal to the NRC your position on the finding in writing. If you choose to request a Regulatory Conference, it should be held within 30 days of the receipt of this letter and we encourage you to submit supporting documentation at least one week prior to the conference in an effort to make the conference more efficient and effective. If a Regulatory Conference is held, it will be open for public observation. If you decide to submit only a written response, such submittal should be sent to the NRC within 30 days of the receipt of this letter.

Please contact Mr. Ronald N. Gardner at (630) 829-9751 within seven days of the date of this letter to notify the USNRC of your intentions. If we have not heard from you within ten days, we will continue with our significance determination and enforcement decision and you will be advised by separate correspondence of the results of our deliberations on this matter.

Since the USNRC has not made a final determination in this matter, no Notice of Violation is being issued for this inspection finding at this time. In addition, please be advised that the number and characterization of the apparent violation described in the enclosed inspection report may change as a result of further USNRC review.

Additionally, based on the results of this inspection, the inspectors identified one issue of very low safety significance (Green). The issue was determined to involve a violation of USNRC requirements. However, because of the very low safety significance and because the issue has been entered into your corrective action program, the USNRC is treating this issue as a Non-Cited Violation, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you contest the violation or significance of Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. 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 Resident Inspector Office at the Kewaunee Nuclear Power Plant.

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

Sincerely,

/RA/

Cynthia D. Pederson, Director
Division of Reactor Safety

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

Enclosure: Inspection Report 50-305/02-06(DRS)

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

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Sincerely,

/RA/
Cynthia D. Pederson, Director
Division of Reactor Safety

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

Enclosure: Inspection Report 50-305/02-06(DRS)

cc w/encl: D. Graham, 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:	50-305/02-06
Licensee:	Nuclear Management Company, LLC.
Facility:	Kewaunee Nuclear Power Plant
Location:	N 490 Highway 42 Kewaunee, WI 54216
Dates:	July 31 through October 1, 2002
Inspectors:	R. Langstaff, Senior Reactor Inspector S. Pergande, Observer
Approved By:	Ronald N. Gardner, Chief Electrical Engineering Branch Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000301-02-06; Nuclear Management Company, LLC.; on 07/31-10/01/02, Kewaunee Nuclear Power Plant. Follow-Up Inspection.

The inspection was conducted by a Region III inspector. The inspection identified one issue preliminarily determined to be of low to moderate safety significance and one issue of very low safety significance. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process." The USNRC'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, and can be found at the Reactor Oversight Process website at http://www.nrc.gov/NRR/OVERSIGHT/assess/index.html.

A. Inspection Findings

Cornerstone: Mitigating Systems

TBD. During performance of follow-up activities in response to a USNRC inspection, the licensee identified that fire area TU-95B had been misclassified in that it should have been classified as required to meet the requirements of Section III.G.3 of 10 CFR Part 50, Appendix R. An apparent violation of 10 CFR Part 50, Appendix R, Section III.G.3 was identified for the failure to provide fire area TU-95B with a fixed fire suppression system.

This issue has been preliminarily determined to have low to moderate safety significance (White). As a result of failing to have a fixed fire suppression system, there was a greater likelihood that a fire in fire area TU-95B would not be suppressed and redundant trains of cables and equipment required for safe shutdown could be damaged. The corresponding damage could require a shutdown of the plant from outside the control room, significantly increasing the complexity of manual actions required to achieve safe shutdown. (Section 4OA2.1)

Green. During performance of a triennial fire protection inspection, USNRC Region III staff identified that heat detectors used for activation of a diesel generator room carbon dioxide (CO_2) system were not located and installed in accordance with the applicable National Fire Protection Association (NFPA) code. Specifically, no heat detectors were located at the ceiling level. The failure to appropriately locate and install heat detectors for actuation of the CO_2 system is a violation of the Kewaunee Nuclear Power Plant operating license.

The finding was greater than minor because it affected the protection against external factors (i.e., fire) attribute for mitigating systems. As a result of the inadequate heat detector placement, actuation of the carbon dioxide system in the diesel generator room could be delayed. The finding was of very low safety significance because the inspector was not able to identify a fire scenario in which safety significant cables would be damaged prior to actuation of the carbon dioxide system. (Section 4AO5.1)

REPORT DETAILS

Summary of Plant Status: Unit 1 was operated at or near 100 percent power throughout the inspection period.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems (71152)

.1 Lack of Fixed Suppression System for Alternate Shutdown Area

a. Inspection Scope

In the process of responding to an issue identified during a USNRC triennial fire protection inspection (Inspection Report (IR) 50-305/01-02), the licensee identified that fire area TU-95B was required to meet the requirements of 10 CFR Part 50, Appendix R, Section III.G.3. Fire area TU-95B lacked a fixed suppression system as required by 10 CFR Part 50, Appendix R, Section III.G.3. USNRC Region III staff determined that the issue was potentially more than of very low safety significance. The inspector reviewed the issue concerning the lack of a fixed suppression system, identification and associated corrective action history, potential fire scenarios, and associated safety significance.

b. Findings

One finding involving an apparent violation of 10 CFR Part 50, Appendix R, Section III.G.3, was identified for the failure to provide a fixed suppression system in fire area TU-95B. The finding was preliminarily determined to be of low to moderate safety significance, (i.e., White).

b.1 Issue Identification and History

While conducting research in response to a USNRC triennial fire protection inspection (IR 50-305/01-02), the licensee determined that fire area TU-95B may not have originally been correctly classified (as an Appendix R, III.G.2 area). The licensee initially placed the issue in their corrective action system on March 30, 2001, under Kewaunee Assessment Process (KAP) Work Order (WO) 01-006587. During an August 2001 USNRC inspection (documented by IR 50-305/01-12), the USNRC identified that KAP WO 01-006587 had been inappropriately closed by the line organization (documented by KAP WO 01-013475). However, the KAP had not yet gone through a licensee administrative review required for final closure which may have identified the inappropriate closure without USNRC intervention. The licensee reopened KAP 01-006587 on August 17, 2001, and continued to pursue the correct classification for fire area TU-95B. On October 13, 2001, the licensee determined that fire area TU-95B should have been classified as an Appendix R, III.G.3 area. As such, the fire area was required to have a fixed fire suppression system. Fire area TU-95B did not have a fixed fire suppression system. The licensee entered this issue into their corrective action program as KAP WO 01-016753 and instituted one hour fire watches

for the area as a compensatory measure. During this inspection, the inspector verified that the one-hour fire watches remained in effect for the fire area. Based on discussions with the licensee, the inspector learned that the licensee planned to install a fixed suppression system in the fire area to establish compliance.

b.2 Fire Area Description

Fire area TU-95B contained cables for both trains of safe shutdown equipment. The fire area contained some "B" train equipment such as the 1B motor-driven auxiliary feedwater pump and the 1-62 and 1-61 480 volt switchgear cabinets. Cables for some train "A" equipment, such as the control circuits for the "A" diesel generator, 1-51 and 1-52 480 volt switchgear buses, and service water pumps 1A1 and 1A2, were also routed through the room. However, control of train "A" equipment could be transferred to a remote shutdown panel located in a separate fire area allowing for safe shutdown from outside the control room.

b.3 Risk Significance

In accordance with Inspection Manual Chapter (IMC) 0612, the inspector determined that the issue was more than minor because the finding is associated with the protection against external factors (i.e., fire) attribute of the mitigating systems reactor safety cornerstone and affects the mitigating systems objective.

In accordance with IMC 0609, Appendix A, the inspectors performed a Significance Determination Process (SDP) Phase 1 screening and determined that the finding degraded the Fire Protection portion of the Mitigation Systems Cornerstone. As such, screening under IMC 0609, Appendix F, was required. Based on Figure 4-1 of IMC 0609, Appendix F, the finding was determined to affect manual suppression capability. Under the screening criteria for Figure 4-3 of IMC 0609, Appendix F, the inspector determined that the fixed suppression system was affected. As such, a Phase 2 analysis was required.

The licensee had performed fire modeling (documented by Point Beach Nuclear Plant Engineering Evaluation 2002-0008, SDP Fire Risk Evaluation for Kewaunee Safeguards Alley without Suppression) of the major potential sources of fire in fire area TU-95B. The licensee's evaluation determined that one fire scenario, involving a large oil spill from the "B" motor-driven auxiliary feedwater pump, could result in loss of redundant trains of equipment. The inspector reviewed the evaluation and concurred with the results.

The fire scenario identified by the licensee involved a spill and ignition of several gallons of lubricating oil from the "B" train motor-driven AFW pump. The spill would not be contained by pump skid and was modeled as having about a nine foot diameter. Cable trays (the north set) for one train were located approximately ten feet off of the floor of the room, almost directly above the pump. Cables trays for the opposite train were located on the south side of the room, approximately nine feet from the north set of cable trays and 11.5 feet above the floor. The room is approximately 25.5 feet by 20 feet in area and 18.5 feet high with minimal airflow between adjacent spaces. The

fire modeling performed by the licensee showed that cables within the north set of cable trays would reach failure and ignition temperature, 700 degrees (°) Fahrenheit (F), within a minute and that cables within the south set of cable trays would reach 700°F shortly thereafter.

The licensee had performed a partial review of cables in the room and determined that, at least for some equipment, cables for both trains of equipment ran through the room. The equipment specifically identified by the licensee as being affected included control circuits for all four service water pumps, control circuits for both diesel generators, and three of four containment fan coil units. Consequently, alternative shutdown actions would have to be performed.

For performance of the Phase 2 SDP, the inspector used an ignition frequency of 3.27×10^{-4} per year based on the value the licensee had used in their evaluation. The licensee derived this value based on industry practice for risk assessments. The inspector determined that the value was reasonable for a pump ignition source. The inspector did not provide credit for a fire barrier because the scenario only involved one room and the cables were not protected by a fire barrier. Additionally, redundant trains of cables were separated by less than 20 feet. Full credit for manual suppression for an area outside the control room was provided because no problems with respect to the fire brigade had been identified. No credit was provided for automatic suppression because the area did not have a fixed or automatic suppression system. Alternate shutdown capability to restore one train was credited, consistent with the examples given in MC 609, Appendix F, Attachment 1, since no deficiencies were identified with respect to alternate shutdown capability. The review of alternate shutdown capability was documented in Sections 1R05.4 and 1R05.5 of IR 50-305/01-02(DRS). Based on these factors and performance of a Phase 2 SDP, the inspector determined that the lack of a fixed suppression system was preliminarily of low to moderate safety significance, (i.e., White).

b.4 Regulatory Issue Associated with Lack of Fixed Suppression System

10 CFR 50.48, Section (b)(2) requires, in part, that all nuclear power plants licensed to operate before January 1, 1979, must satisfy the applicable requirements of Appendix R to this part, including specifically the requirements of Sections III.G, III.J, and III.O. The Kewaunee Nuclear Plant was licensed to operate prior to January 1, 1979. 10 CFR Part 50, Appendix R, Section III.G.2, requires, in part, that for cables or equipment of redundant trains of systems necessary to achieve and maintain hot shutdown conditions which are located within the same fire area outside of primary containment, one of the following means of ensuring that one of the redundant trains is free of fire damage shall be provided: (a) separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a three hour rating; (b) separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards; and fire detectors and an automatic fire suppression system shall be installed in the fire area; or (c) enclosure of cables and equipment and associated non-safety circuits of one redundant train in a fire barrier having a one-hour fire rating; and fire detectors and an automatic fire suppression system shall be installed in the fire area. 10 CFR Part 50,

Appendix R, Section III.G.3, requires, in part, that alternative or dedicated shutdown capability be provided where the protection of systems whose function is required for hot shutdown does not satisfy the requirements of Section III.G.2. In addition, fire detection and a fixed fire suppression system shall be installed in the area, room, or zone under consideration. As of October 1, 2002, a fixed fire suppression system was not installed in fire area TU-95B, a fire area where alternative or dedicated shutdown capability was provided because the protection of systems whose function is required for hot shutdown did not satisfy the requirements of 10 CFR Part 50, Appendix R, Section III.G.2. This issue is considered an apparent violation (AV 50-305/02-06-01).

4OA5 Other Activities (71152)

.1 (Closed) Unresolved Item 50-305/01-02-03: Diesel generator room heat detector placement. Heat detectors in the 1B diesel generator room were suspended more than six feet below the ceiling. The heat detectors were used to provide automatic actuation of the carbon dioxide (CO_2) system in the room. Five of the heat detectors were located approximately 6-1/2 feet below the ceiling and a sixth detector was located approximately 10-1/2 feet below the ceiling. The heat detectors had a temperature setting of 160°F. National Fire Protection Association (NFPA) code 72E, "Automatic Fire Detectors," required that spot-type heat detectors be located at the ceiling. During the previous inspection, the inspectors were concerned that the placement of the heat detectors significantly below the ceiling could result in delayed actuation of the CO_2 system. At that time, the licensee entered this issue into their corrective action program as KAP WO 01-001999 for lack of documented analysis for deviation from NFPA code.

The licensee provided a written response by letter dated May 17, 2001. The response provided an evaluation intended to show system operability. During this inspection, the licensee also provided a similar evaluation documented by Fire Protection Engineering Evaluation (FPEE) 040. The evaluations presented the argument that ventilation in the upper portions of the room would affect detectors located at the ceiling and that the ventilation would provide adequate mixing of the air to ensure that a detector would be actuated in the event of a large oil fire. The inspector reviewed the evaluations and disagreed with the licensee conclusion that the existing placement of heat detectors was acceptable. Although the inspector agreed that the ventilation would affect detectors placed at the ceiling, the inspector noted that the lack of detectors placed at the ceiling could result in a delay of actuation under some circumstances (such as when the ventilation was not in operation).

The inspector determined that the finding was more than minor because the finding is associated with the protection against external factors (i.e., fire) attribute of the mitigating systems reactor safety corner stone and the finding affects the mitigating systems objective. However, given that the licensee used thermoset cables with failure temperatures of about 700°F, the inspector was not able to postulate a fire scenario in which damage to cables for equipment not directly involved in the fire would occur without CO_2 actuation. In addition, since the CO_2 system is not required for 10 CFR Part 50, Appendix R compliance, the issue would not require a Phase 2 significance determination evaluation as described by MC 609, Appendix F. Consequently, the inspector determined that the issue was of very low safety significance.

KNPP Facility Operating License No. DPR-43, Section 2.C(3), stated, in part, that the licensee shall implement and maintain in effect all provisions of the approved Fire Protection Program as described in the KNPP Fire Plan, as referenced in the Updated Safety Analysis Report, and as approved in the Safety evaluation reports, dated November 25, 1977, and December 12, 1978. Section 4.1 of the Fire Protection Program Plan (Fire Plan), Revision 3, stated, in part, that the Fire Protection Program Analysis and the Appendix R Design Description support the Fire Plan by providing descriptions of detection and suppression systems and other methods of limiting fire damage. Appendix E, "NFPA Code Conformance," of the Fire Protection Program Analysis indicated that the code of record for detectors was NFPA 72E, "Automatic Fire Detectors," 1974. Section 3-4.1 of NFPA 72E-1974, stated that spot-type heat detectors shall be located upon the ceiling not less then 6 inches from the side wall, or on the side walls between 6 inches and 12 inches from the ceiling. The failure to install the heat detectors upon the ceiling in diesel generator 1B room as required is a violation of a Kewaunee Nuclear Power Plant license condition as described above. This violation is associated with a 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 (NCV), consistent with Section VI.A.1 of the USNRC Enforcement Policy. This violation is in the licensee's corrective action program as KAP WO 01-001999 and Corrective Action Process (CAP) 012455 (NCV 50-305/02-06).

.2 (Closed) Unresolved Item (URI) 050-305/02-02-01: Classification of fire area TU-95B not in accordance with 10 CFR Part 50, Appendix R. The subject of this unresolved item is discussed in section 4OA2.1 above. One apparent violation was identified. This unresolved item is considered closed. The apparent violation will be addressed by subsequent correspondence.

4OA6 Meetings

On August 2, 2002, at the conclusion of the on-site inspection activities, the inspector presented the initial findings to Mr. Hoefert and other members of licensee management at the Kewaunee Nuclear Power Plant. On October 1, 2002, the inspector presented the findings to Mr. Coutu. The licensee representatives acknowledged the findings presented. The licensee did not identify any material reviewed during the inspection as being proprietary.

KEY POINTS OF CONTACT

T. Coutu, Site Vice-President
T. Esper, Supervisor, Engineering Programs
N. Hoefert, Manager, Program Engineering
R. Nicolai, Supervisor, Assessment
T. Webb, Manager, Regulatory Affairs

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-305/02-06-01	AV	Failure to Provide Fixed Suppression System in Fire Area TU-95B
50-305/02-06-02	NCV	Inappropriate Placement of Diesel Generator Room Heat Detectors

Closed

50-305/01-02-03	URI	Inappropriate Placement of Diesel Generator Room Heat Detectors
50-305/02-02-01	URI	Classification of Fire Area TU-95B Not In Accordance With 10 CFR Part 50, Appendix R
50-305/01-06-02	NCV	Inappropriate Placement of Diesel Generator Room Heat Detectors

Discussed

None.

LIST OF ACRONYMS

°	Degrees
AV	Apparent Violation
CAP	Corrective Action Process
CFR	Code of Federal Regulations
CO_2	Carbon Dioxide
DRS	Division of Reactor Safety
IMC	Inspection Manual Chapter
IR	Inspection Report
KAP	Kewaunee Assessment Process
LLC	Limited Liability Company
NCV	Non-Cited Violation
NFPA	National Fire Protection Association
SDP	Significance Determination Process
TBD	To Be Determined
USNRC	U.S. Nuclear Regulatory Commission

LIST OF DOCUMENTS REVIEWED

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

Corrective Action Documents

KAP 01-1999 CAP 002488	During the February 2001 Fire Protection Inspection, an USNRC Inspector Noted a Lack of Documentation Regarding NFPA Code Deviations	February 15, 2001
KAP 01-6587 CAP 002319	Appendix R Classification of the B AFW Pump Room	March 30, 2001
KAP WO 01-013475 CAP 008255	KAPs Progressed to Complete Status Not Complete	August 17, 2001
CAP 001150	Appendix R Classification of the B AFW Pump Room	October 13, 2001
CAP 003628	Perform RCA to Determine Why 1B AFWP Room Was Classified as App R III.G.2	March 19, 2002
CAP 012455		August 1, 2002

Engineering Evaluations

Point Beach 2002-0008	SDP Fire Risk Evaluation for Kewaunee Safeguards Alley Without Suppression	March 7, 2002
FPEE 040	Diesel Generator Rooms Carbon Dioxide Suppression Systems	July 31, 2002

Reports

EPRI 1003111	Fire Events Database and Generic Ignition Frequency Model for U.S. Nuclear Power Plants [Proprietary]	November 2001