NMC
Committed to Nuclear Excellence

Kewaunee Nuclear Power Plant
Operated by Nuclear Management Company, LLC

April 1, 2005

NRC-05-040
10 CFR 50 Appendix A

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Kewaunee Nuclear Power Plant
Docket 50-305
License No. DPR-43

Generic Letter 2003-01: Control Room Habitability - Supplemental Response

References: 1) Letter from Nuclear Management Company, LLC to NRC, "Generic Letter 2003-01: Control Room Habitability 60-Day Response", dated August 7, 2003, ADAMS Accession NO. ML032260513

2) Letter from Nuclear Management Company, LLC to NRC, "Generic Letter 2003-01: Control Room Habitability – Response To Commitments", dated November 25, 2003, Adams Accession NO. ML033300162

3) Letter from Nuclear Management Company, LLC to NRC, "Generic Letter 2003-01: Control Room Habitability – Supplemental Response Commitment Extension", dated March 15, 2005

The Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 2003-01 on June 12, 2003. The GL contains a 180-day requested response for specific information. Licensees that could not provide the information or could not meet the requested completion date were requested to submit a written response within 60 days to address any proposed alternative course of action, including the basis for acceptability and the schedule for completion of the alternative course of action. Reference 1 is the Nuclear Management Company, LLC (NMC) 60-Day response to the GL. In reference 1, NMC committed to provide a schedule for the completion of the requested items in the GL. Reference 2 provided the schedule to complete the tasks necessary to assure the information requested in the GL is available, and reference 3 requested an extension to two of the commitments.

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In reference 2, NMC committed to provide responses to items 1(a) and item 1(b), part 1, of GL 2003-01, within 90 days of performing the American Society for Testing and Materials (ASTM) E741 testing. The ASTM E741 testing was completed on December 15, 2004; therefore, the date NMC committed to provide the NRC with this information is March 15, 2005. Due to a forced outage, NMC has redirected the resources for completing the response to issues associated with the outage. This redirection caused a delay in completing NMC's response to GL 2003-01, items 1(a) and 1(b), part 1, for the Kewaunee Nuclear Power Plant.

In reference 3, NMC committed to provide the requested response to items 1(a) and item 1(b), part 1, of GL 2003-01 by April 1, 2005. This letter is NMC's response providing the requested information to items 1(a) and item 1(b), part 1, of GL 2003-01. Enclosure 1 to this letter provides the response to GL 2003-01 and satisfies the following commitments made in reference 3:

"Perform the ASTM E741 testing and, provide the requested response to Generic Letter Item 1(a)." "Verifying by ASTM E741 testing that the most limiting inleakage has been incorporated into the hazardous chemical assessments (GL 2003-01 item 1(b) part 1)." ASTM E741 baseline testing results are provided in Enclosure 1. NMC intends to bring the Control Room Envelope (CRE) boundary into full compliance by submitting a License Amendment Request (LAR) that includes revised radiological accident analyses, using the alternate source term methodology and associated Technical Specification revisions.

Summary of Commitments

Enclosure 2 provides a summary and status of the commitments made for Kewaunee Nuclear Power Plant (KNPP) associated with GL 2003-01. This letter revises the existing commitment and adds a new commitment.

The existing commitment is:

"Development of technical specification changes (and any associated plant modifications) to support requested information GL 2003-01 item 1(c). Schedule for Completion: T = December 2004, T+120 days (2)

(2) Technical Specification submittal dates are contingent on timely approval and issuance of the CLIIP [Consolidated Line Item Improvement Process] for the Technical Specification Task Force (TSTF) – 448 traveler on control room habitability. Completion dates may change based upon any plant modifications determined to be necessary by the testing."

The revised commitment is:

Submit to the NRC, proposed changes to the Technical Specifications based upon the final, approved version of Technical Specification Task Force (TSTF) traveler – 448, adjusted, as needed, to account for plant-specific KNPP CRE design and licensing basis, within 180 days following NRC approval of TSTF-448.

The new commitment is:

A LAR requesting modifications to the current approved Alternate Source Term radiological analyses and the Technical Specifications (TS) will be submitted to correct the non-conservative TS by using the guidance of Administrative Letter 98-10.

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Nuclear Management Company, LLC

Enclosures (2)

cc : Administrator, Region III, USNRC
Project Manager, Kewaunee, USNRC
Resident Inspector, Kewaunee, USNRC
Electric Division, PSCW

GENERIC LETTER 2003-01
KEWAUNEE NUCLEAR POWER PLANT

Nuclear Regulatory Commission (NRC) Requested Information

NRC Question 1

Provide confirmation that your facility's control room meets the applicable habitability regulatory requirements (e.g., GDC 1, 3, 4, 5, and 19) and that the CRHSs are designed, constructed, configured, operated, and maintained in accordance with the facility's design and licensing bases.

NMC Response To Question 1

Nuclear Management Company, LLC (NMC) reviewed Control Room Habitability (CRH) design and licensing bases documents consistent with NEI 99-03, June 2001 revision 4, and confirmed that the KNPP control room meets the applicable habitability regulatory requirements. This review also confirmed that the Control Room Envelope (CRE) and Control Room Ventilation (CRV) systems are currently designed, constructed, configured, operated, and maintained in accordance with the plant design and current licensing basis described in the Updated Safety Analysis Report (USAR).

Control Room Habitability Design Features

The Kewaunee Nuclear Power Plant (KNPP) is equipped with a control room, which contains those controls and instrumentation necessary for safe operation of the plant, including the reactor and the turbine-generator, under normal and accident conditions.

Sufficient design features (shielding, distances, and containment integrity and filtration systems) are provided to assure that control room personnel shall not be subjected to doses under postulated accident conditions during occupancy of, and ingress to and egress from the control room that, exceed established dose acceptance criteria. All of the design basis radiological accidents were addressed in the license amendment for implementing Alternate Source Term (AST) for the KNPP.[1] In the AST license amendment, NMC requested a revision to the radiological consequence analyses for the KNPP design-basis accidents to implement the AST as described in Regulatory Guide 1.183[2] and pursuant to 10 CFR 50.67, "Accident Source Term." In support of this request, the dose consequence analyses were revised to show that the control room dose remains below the limits prescribed in 10 CFR 50.67, "Accident Source Term," guidelines. Subsequently the NRC found the analyses acceptable and issued a safety evaluation report approving the use of the AST methodology for the KNPP[3].

The analysis NMC submitted, using the AST methodology, showed the maximum 30-day whole body dose consequence satisfied the dose acceptance criteria of 5.0 rem TEDE; therefore, the analysis for KNPP was acceptable. The analyses performed for the stretch power uprate followed the methodology from the AST license amendment. The radiological accident analyses performed for the KNPP stretch power uprate also satisfied the control room dose acceptance criteria of 5.0 REM and were approved as part of the stretch power uprate license amendment.[4]

In response to Item III.D.3.4 of NUREG-0737, a review of post-accident control room habitability was performed. The NRC determined that the control room habitability systems are acceptable and will provide a safe, habitable environment within the control room under design basis accident radiation and toxic gas conditions, including loss of coolant accidents[5].

General Conformance with General Design Criteria

The Kewaunee Nuclear Power Plant was designed, constructed, and is being operated to comply with Wisconsin Public Service Corporation's (WPSC) understanding of the intent of the Atomic Energy Commission (AEC) General Design Criteria (GDC) for Nuclear Power Plant Construction Permits, as proposed on July 10, 1967. Since the construction of the plant was about 50% completed prior to the issuance of the February 20, 1971, 10 CFR 50 Appendix A General Design Criteria, the plant was not required to be reanalyzed and the Final Safety Analysis Report (FSAR) was not required to be revised to reflect these later criteria. However, the AEC Safety Evaluation Report (SER), issued July 24, 1972, acknowledged that the AEC staff assessed the plant, as described in the FSAR (Amendment No. 7), against the Appendix A design criteria and "...are satisfied that the plant design generally conforms to the intent of these criteria."

In a letter dated October 2, 1967, the Atomic Industrial Forum (AIF) distributed comments on the July 1967 AEC GDC. This document proposed changes to the AEC GDC in both wording and content, including deletion of some criterion. The Kewaunee FSAR adopted the AIF document as WPSC's understanding of the method for complying with the AEC GDC, as evidenced by the various sections in the FSAR, which quote the AIF criterion rather than the AEC GDC. However, the AEC SER specifically states that the staff reviewed the plant design against the 1971 version of the AEC GDC, and found the design acceptable for issuing a plant operating license.

Because KNPP was constructed pre-GDC, the numbering of the AEC GDC differs from the current GDC found in 10 CFR part 50, Appendix A The following table compares the two.

Description	CFR GDC	KNPP GDC
Quality Standards and Records	1	1 & 5
Fire Protection	3	3
Environmental and Dynamic Effects Design Bases	4	40
Sharing of Structures, Systems, and Components	5	4
Control Room	19	11

In the following discussion, the GDC applicable to the KNPP are listed with the associated 10 CFR 50 Appendix A GDC criteria listed in parenthesis.

Specific Conformance with Control Room Habitability Regulatory Requirements:

KNPP GDC 1 & 5 - Quality Standards and Records (Appendix A - GDC 1)

KNPP GDC 1 - *Quality Standards.*

Those systems and components of reactor facilities which are essential to the prevention of accidents which could affect the public health and safety or to mitigation of their consequences shall be identified and then designed, fabricated, and erected to quality standards that reflect the importance of the safety function to be performed. Where generally recognized codes or standards on design, materials, fabrication, and inspection are used, they shall be identified. Where adherence to such codes or standards does not suffice to assure a quality product in keeping with the safety functions, they shall be supplemented or modified as necessary. Quality assurance programs, test procedures, and inspection acceptance levels to be used shall be identified. A showing of sufficiency and applicability or codes, standards, quality assurance programs, test procedures, and inspection acceptance levels used is required.

The systems and components of the facility have been classified according to their importance in the prevention and mitigation of accidents, which could cause undue risk to the health and safety of the public. Those items vital to safe shutdown and isolation of the reactor or whose failure might cause or increase the severity of an accident or result in an uncontrolled release of substantial amounts of radioactivity are designated Class I. Those items important to reactor operation but not essential to safe shutdown and isolation of the reactor or control of the release of substantial amounts of radioactivity are designated Class II. Those items not related to reactor operation or safety are designated Class III. These classifications are described in KNPP Updated Safety Analysis Report (USAR) Appendix B.

KNPP USAR Appendix B lists the Control Room as a Class I structure and the Control Room Air Conditioning and Ventilation System as a Class I system.

Quality standards of material selection, design fabrication and inspection conform to the applicable provisions of recognized codes and good nuclear design practice.

KNPP is considered to be in full compliance with the KNPP GDC - 1 as described above.

KNPP GDC – 5 Records Requirements

Records of the design, fabrication, and construction of essential components of the plant shall be maintained by the reactor operator or under its control throughout the life of the reactor.

The NMC maintains records of the design, fabrication, construction, and testing of Class I plant components throughout the life of the plant. Additionally, written records are kept of all plant operations, major maintenance, incidents and accidents, and radiation exposure of all personnel and are retained in accordance with the Technical Specifications and the Operational Quality Assurance Program Description.

KNPP is considered to be in full compliance with the KNPP GDC - 5 as described above.

KNPP GDC 3 - Fire Protection (Appendix A GDC 3)

The reactor facility shall be designed to minimize the probability of events such as fires and explosions, and to minimize the potential effects of such events to safety. Noncombustible and fire resistant materials shall be used whenever practical throughout the facility, particularly in areas containing critical portions of the facility such as containment, control room, and components of engineered safety features.

The Kewaunee Fire Protection Program was developed in accordance with the guidance of Appendix A to Branch Technical Position (BTP) APCSB 9.5-1 as described in NRC's Fire Protection Safety Evaluation Report dated December 12, 1978[6] and supplement dated February 13, 1981[7]. Kewaunee complies with the applicable sections of 10 CFR 50 Appendix R, as described in the Safety Evaluation Report dated December 22, 1981[8].

Structures, systems and components important to safety are designed and located to minimize the fire hazard. Fire Protection systems are designed to minimize the effects of fires on systems, structures and components important to safety. Adequate means are provided to mitigate the fire hazard encountered in the plant.

Non-combustible and fire resistant materials are used wherever practical throughout the CRE and three-hour rated fire barriers are used to isolate the control room from other areas. Penetrations in fire barriers, such as doorways, cable tray or conduit penetrations, and ventilation penetrations are protected as required. The control room is equipped with portable fire extinguishers, and hose stations are available from adjacent areas.

A dedicated shutdown panel is provided outside the CRE to assure safe shutdown can be achieved should a postulated exposure fire require the evacuation of the control room.

KNPP is considered to be in full compliance with the KNPP GDC - 3 as described above.

KNPP GDC 40 - Missile Protection (Appendix A GDC 4)

Protection for engineered safety features shall be provided against dynamic effects and missiles that might result from plant equipment failures.

All engineered safety features associated with the CRE are protected against dynamic effects and missiles resulting from equipment failures.

All systems and components designated Class I are so designed so that there is no loss of function in the event of the Design Basis Earthquake acting in the horizontal and vertical directions simultaneously. In addition, all Class I structures are designed to withstand all environmental factors including tornadoes. The working stresses for both Class I and Class II items are kept within code allowable values for the Operational Basis Earthquake. Similarly, measures were taken in the plant design to protect against high winds, flooding, and other natural phenomena.

KNPP is considered to be in full compliance with the KNPP GDC - 40 as described above as it relates to the CR.

KNPP GDC 4 - Sharing of Systems (Appendix A GDC 5)

Reactor facilities shall not share systems or components, unless it is shown the sharing does not impair safety.

Analyses confirm that the sharing of components among systems does not result in interference with the basic function and operability of these systems and, hence, there is no undue risk to the health and safety of the public. Those systems or components, which are shared functionally within the plant, are designed in such a manner that the sharing does not impair plant safety. Also, KNPP is a one-unit site and therefore, there are no shared systems between units.

KNPP is considered to be in full compliance with the KNPP GDC - 4 as described above.

KNPP GDC 11 - Control Room (Appendix A GDC 19)

This facility shall be provided with a control room from which actions to maintain safe operational status of the plant can be controlled. Adequate radiation protection shall be provided to permit access, even under accident conditions, to equipment in the control room or other areas as necessary to shut down and maintain safe control of the facility without radiation exposures of personnel in excess of 10 CFR 20 limits. It shall be possible to shut the reactor down and maintain it in a safe condition if access to the control room is lost due to fire or other cause.

The control room contains all controls and instrumentation necessary for operation of the reactor, turbine generator, auxiliary and emergency systems under normal or accident conditions.

The control room is designed and equipped to minimize the possibility of events, which might preclude occupancy. In addition, provisions were made for bringing the plant to and maintaining a hot shutdown condition from a dedicated shutdown panel located in the turbine building safeguards alley area.

The employment of non-combustible and fire retardant materials in the construction of the control room and the equipment and furnishings, contained therein, minimizes the probability of a control room fire. The location of firefighting equipment in the control room, and the continuous presence of an operator trained to work in smoke with air pack breathing apparatus, and trained in firefighting techniques further reduces the probability that the control room will become uninhabitable.

Sufficient design features (shielding, distances, and containment integrity and filtration systems) are provided to assure that control room personnel shall not be subjected to doses under postulated accident conditions during occupancy of, and ingress to and egress from the control room, that exceed established dose acceptance criteria. All of the design basis radiological accidents were addressed in the License Amendment Request (LAR) for implementing AST for the KNPP.[9] In the AST LAR, NMC requested a revision to the radiological consequence analyses for the KNPP design-basis accidents to implement the AST as described in Regulatory Guide 1.183 and pursuant to 10 CFR 50.67, "Accident Source Term."

In support of this request, the dose consequence analyses were revised to show that the control room dose remains below the limits prescribed in 10 CFR 50.67, "Accident Source Term," guidelines. Subsequently the NRC found the analyses acceptable and issued a safety evaluation approving the use of the AST methodology for the KNPP[10]. The analysis NMC submitted, using the AST methodology, showed the maximum 30-day whole body dose consequence satisfied the dose acceptance criteria of 5.0 Rem TEDE; therefore, the analysis for KNPP was acceptable. The analyses performed for the stretch power uprate[11] followed the methodology from the AST licensing submittal. The radiological accident analyses performed for the KNPP stretch power uprate also satisfied the control room dose acceptance criteria of 5.0 REM and were approved as part of the stretch power uprate license amendment.[12]

Due to tracer gas test results exceeding radiological accident analysis assumptions for control room unfiltered in-leakage (see item 1a below), the KNPP radiological accidents were re-analyzed assuming higher unfiltered in-leakage. These revised radiological accident analyses will be submitted to NRC along with the applicable revised Technical Specifications in a future LAR.

In response to Item III.D.3.4 of NUREG-0737, a review of post-accident control room habitability was performed. The NRC determined that the control room habitability systems are acceptable and will provide a safe, habitable environment within the control room under design basis accident radiation and toxic gas conditions, including loss of coolant accidents.[13]

NUREG 0737, "Clarification of TMI Action Plan Requirements," item III.D.3.4, "Control Room Habitability Requirements," required licensees to assure that control room operators will be adequately protected against the effects of accidental release of toxic and radioactive gas and that the plant can be safely operated or shutdown under design basis accident conditions. In the NRC's safety evaluation (SE)[14] associated with this item, the NRC stated that they reviewed the submittals for the KNPP and evaluated them using the criteria of Standard Review Plan (NUREG 0800) (SRP) sections 2.2.1, 2.2.2, 2.2.3, and 6.4, and Regulatory Guides 1.78 and 1.95. The NRC concluded that the design meets the criteria identified in NUREG 0737 and is acceptable.

WPSC, the licensee at the time, took four exceptions to SRP acceptance criteria. Those exceptions were:

1. Requirements for the storage of food supplies in the control room,
2. Requirement for the storage of potassium Iodide tablets in the control room,
3. Requirement for redundancy of radiation monitors in the control room's normal ventilation system air intake, and
4. Requirement to perform a toxic gas, ammonia spill, analysis to determine the affects on control room habitability.

The NRC staff accepted WPSC's position for exceptions 1 and 2 that these stores need not be kept within the control room, and that it is sufficient that they be readily available from nearby sources. The NRC accepted WPSC's position on exception 3 based on the condition that for all releases of radioactivity, at least one other radiation monitor would alarm in the control room or a control room ventilation system isolation signal would occur, such that the single monitor in the air intake would never be the sole means of isolating that system. WPSC resolved the fourth exception by reporting their reappraisal of the protection of the control room (CR) against toxic gases. These conditions are still in effect.

The CR ventilation system provides a large percentage of recirculated air. Process radiation monitor channel R-23 monitors control room ventilation air for radiation. If a high radiation condition exists, the monitor initiates closure of the outside air intake and starts the CR post accident recirculation (CRPAR) system. KNPP control room isolation and start of CRPAR also occurs on Safety Injection and Steam Exclusion signals. In addition, local CR area radiation monitor channel R-1 monitors CR air for radiation and alarms when it reaches the CR area radiation monitor setpoint.

KNPP is considered to be in full compliance with the KNPP GDC - 11 as described above.

NRC Question 1(a)

That the most limiting unfiltered inleakage into your CRE (and the filtered inleakage if applicable) is no more than the value assumed in your design basis radiological analyses for CRE habitability. Describe how and when you performed the analyses, tests, and measurements for this confirmation.

NMC Response To Question 1(a)

Tracer gas in-leakage tests were performed in December 2004 at the KNPP by NUCON International Inc. The amount of air in-leakage into the CRE was evaluated in accordance with NUCON Procedures using the concentration decay method under isolation conditions. This test is based on ASTM E 741 and conducted to ensure compliance with the US NRC Generic Letter 03-01.

Two concentration decay tests were performed to determine total unfiltered in-leakage, one with CRPAR Train A operating and one with CRPAR Train B operating. The following results were obtained for total unfiltered in-leakage to the three rooms contained in the CRE

Table 1
Control Room Envelope Inleakage Test Results

Date of Test	Train Tested	Total Inleakage
14 December 2004	CRPAR Train A	409 ±29 cfm
15 December 2004	CRPAR Train B	447±51 cfm

The tracer gas in-leakage test showed that the current radiological accident analysis unfiltered in-leakage assumption of 200 cfm was not met. An operability determination was performed that evaluated CRE unfiltered in-leakage in excess of that which was assumed in the analysis. The operability determination specified revised administrative limits of containment leak rate, reactor coolant system activity, and carbon filter absorption efficiency affecting radiological source and potential radiological release pathways. These administrative limits compensate for the higher measured control room in-leakage. The administrative limits, developed from radiological accident analysis sensitivity cases, ensure that the radiological dose consequences remain within the limits specified in the current licensing basis acceptance criteria of 10 CFR 50.67, including the limitations of Regulatory Guide 1.183, July 2000[15]. No credit was taken in the operability determination for the use of self-contained breathing apparatus or potassium iodide.

Revised radiological accident analyses assuming higher unfiltered in-leakage have been performed and will be submitted as part of a future LAR. The revised radiological analyses support the full qualification of the CRE boundary. The LAR requesting modifications to the current approved AST radiological analyses and the technical specifications is the "new commitment" made to correct non-conservative TS by using the guidance of Administrative Letter 98-10 which is discussed in the cover letter.

NRC Question 1(b)

That the most limiting unfiltered inleakage into your CRE is incorporated into your hazardous chemical assessments. This inleakage may differ from the value assumed in your design basis radiological analyses. Also, confirm that the reactor control capability is maintained from either the control room or the alternate shutdown panel in the event of smoke.

NMC Response To Question 1(b)

Hazardous Chemical Assessment
An evaluation of toxic gas sources in the vicinity of the plant was submitted to the NRC on February 28, 1989[16], entitled "Submittal of Kewaunee's Updated Control Room Habitability Evaluation Report to Address NRC Concerns Over Control Room Ventilation".

Attachment 3 of the February 28, 1989 submittal is the Updated Control Room Habitability Evaluation Report, which provides an assessment of control room habitability during and after a postulated release of hazardous chemicals on site using NRC Regulatory Guide 1.78 criteria. Table 7 of that report identifies all chemicals stored on site in quantities of 100 lb or greater and evaluates the impact of Carbon Dioxide use for fire protection within and outside the CRE.

Section 5.0 of the Updated Control Room Habitability Evaluation Report describes a study, which was performed to identify all stationary and frequent mobile sources of hazardous substances within five miles of the plant using the guidance of NRC Regulatory Guide 1.78. The results of a spill of ammonia on Highway 42, closest location to the control room outdoor air intake, was also evaluated. Section 7.0 reviews the results of the on-site and off-site toxic gas studies and concludes that both on-site and off-site toxic gas releases "pose no threat to the habitability of the control room".

A more recent evaluation using the Environmental Protection Agency Risk Management Program methodology as a screening tool, with NUREG/CR-6210 methodology for more detailed analysis when appropriate, addressed spills of hydrazine, dimethylamine, morpholine, and isopropyl alcohol. That evaluation found that the expected concentrations at the control room air intake would be less than the IDLH (Immediately hazardous to life and health) limit. Since the concentrations are less than IDLH limit at the intake, the amount of air in-leakage to the control room will not impact the chemical hazard assessment for the control room.

The results of the hazardous chemical assessment determined the maximum concentration at the outdoor air intake for the control room is less than the toxicity levels used in the regulatory guide.

Conclusion – Hazardous Chemical Assessment
Based on the conclusions of the hazardous chemical assessment, the most limiting inleakage into the CRE will not affect the ability to safely shutdown the plant.

Smoke Issue

Reactor control capability is normally maintained in the control room, located in the Auxiliary Building structure, on Elevation 626. Reactor control capability can also be maintained from the dedicated shutdown panel in the event that the control room becomes uninhabitable. Egress from the control room to the dedicated shutdown panel, in the event of smoke, may be through the Turbine Building Elevation 626 or through the Relay Room at Elevation 606.

Plant operating procedures cover response to fire, smoke, or emergency conditions involving the control room or dedicated shutdown panel areas. Relevant procedures dealing with fire, control room habitability, and operation at the dedicated shutdown panel are:

E-FP-08	Emergency Operating Procedure – Fire
E-O-6	Fire in Alternate Fire Zone
E-O-7	Fire in Dedicated Fire Zone
E-ACC-25	Emergency Control Room A/C System Operation

Self Contained Breathing Apparatus (SCBA) is maintained in the control room for the use of the operators as required. SCBAs are controlled and maintained in accordance with health physics procedure HP-02.002, Respiratory Protective Equipment. Medical qualifications for the operators are specified in plant administrative procedure NAD-01.15, "Medical Examination Program".

Air intake sources for the control room are located above the Auxiliary Building as shown in the Attachment 3, Figure 3, of the February 28, 1989 submittal to NRC[17]. Fire alarms would alert the operators to the presence of fire and the potential for smoke being generated in the plant.

<u>Smoke Source – Offsite and Onsite Adjacent Buildings</u>

The proximate area surrounding KNPP consists of Lake Michigan on the east side with farms on the west and some woods on the north and south of the plant. The amount of natural local combustibles that could generate smoke normally is limited. Vehicle accidents on Highway 42, e.g. tanker truck fire, are possible, but low probability events. A transformer fire, although low probability, could generate smoke close to the plant and plant air intakes. The same holds true for fires involving the Screenhouse, Administration Building, Office Annex/ Warehouse Building, Administrative Training Facility Building, Technical Support Center Building, Simulator Training Facility, Main Security Guardhouse, and trailers. Some of these buildings, although connected to the major plant buildings, are separated by fire protection doors.

Smoke from a fire outside of the plant could be drawn into the Turbine Building, Auxiliary Building, or Control Room through the normal outdoor air intakes.

Warning of smoke generation outside the plant could be provided by any of the following:

(a) Security personnel stationed at the site access station, main guardhouse, or patrolling the site,
(b) Smoke sensors in the control board vertical panels and consoles, which alarm in the control room,
(c) Smoke sensor in the control room HVAC return duct to the Turbine Building,
(d) Fire alarms in plant buildings in which the smoke has entered, e.g. Turbine or Auxiliary Buildings,
(e) Plant equipment alarms (e.g. transformers), or
(f) Operators sensing smoke in the control room or elsewhere.

A smoke detector is installed in the CR heating, ventilating, and air-conditioning system return duct. Activation of the control room ventilation system smoke detector will cause a recirculation bypass damper to close, isolating the return supply to the air conditioning units. The ventilation system will change to a 100% make-up system using outdoor air for make-up and will provide an alarm in the control room. Normal ventilation configuration is roughly 20% outdoor air and 80% recirculation. In this configuration, smoke would continue to be drawn into the control room. The control room would exhaust to the turbine building.

Upon receiving indication from any of these smoke warning sources, the operators would manually realign the control room HVAC system to place the post-accident cleanup filter and fan into operation and close the outside air damper(s) in accordance with the E-ACC-25 procedure identified above. One train would be used at a time. The post-accident cleanup filter will remove most of the smoke particulates permitting continued occupancy of the control room.

Smoke in the control room may also be exhausted to the Turbine Building using portable ventilation equipment.

SCBAs are available to the operators to allow them to work in a smoke environment if required.

Smoke Source – Directly Connected Buildings

Smoke generation was considered for the onsite buildings, which are connected to the Control Room. These include the auxiliary building, turbine building, and the office annex/warehouse building. The latter is directly connected to the turbine building through an open hallway on the 586 level.

Fire alarms would alert the operators to possible smoke generation. Smoke could potentially reach and be drawn into the normal ventilation supplies for the turbine building, auxiliary building, and control room. Operations personnel would manually isolate normal air supplies and place the control room ventilation in the recirculation mode.

If a fire causes inability to monitor or control major plant parameters necessary for safe shutdown from the Control Room, then the Control Room would be evacuated and the plant would be monitored and controlled from the dedicated shutdown panel. The procedures described above would govern these operations.

A Turbine Building fire could potentially affect the ability of the operators to evacuate the control room by the expected path. Alternative paths between the control room and dedicated shutdown panel area are available through the auxiliary building.

Dedicated Shutdown Panel

At KNPP, the "alternate shutdown panel" is referred to as the dedicated shutdown panel. If an event occurs in which the control room would be unavailable for reactor control, the operations staff would evacuate the control room and perform necessary actions to achieve safe shutdown using the dedicated shutdown panel, and related equipment located in the train A safeguards alley, bus 5, and diesel generator A rooms at elevation 586. Entrance to this area is at the elevation 586 of the turbine building.

The dedicated shutdown panel and the bus and diesel generator areas each have safety-related ventilation equipment. The area ventilation air source for the bus and diesel generator area is the safety-related diesel generator ventilation supply from west of the administration building.

Emergency lighting of at least 8-hour duration is provided in areas needed for operation of safe shutdown equipment and related transit routes. This is accomplished using battery powered emergency light units and separation of the normal lighting system powered from a safety related power source for the control room. Plant operators have verified the adequacy of emergency lighting levels by demonstrating the ability to get to and operate the required equipment.

The dedicated shutdown panel area is provided with automatic smoke detectors that alarm locally and alarm and annunciate in the control room. Combustible materials are controlled to very low incidence, allowing only those needed for operation. Portable extinguishers and manual hose stations are available.

The E-O-6 procedure provides instructions on operation of the plant from the dedicated shutdown panel.

Conclusion – Smoke Assessment

It is concluded from the external and internal smoke assessment that during a postulated smoke event, either the control room or the dedicated shutdown panel room will be available for continued occupancy such that the reactor control capability is maintained. The postulated smoke event will not prevent the safe shutdown of the plant.

NRC Question 1(c)

That your technical specifications verify the integrity of the CRE, and the assumed inleakage rates of potentially contaminated air. If you currently have a Δ P surveillance requirement to demonstrate CRE integrity, provide the basis for your conclusion that it remains adequate to demonstrate CRE integrity in light of the ASTM E741 testing results. If you conclude that your Δ P surveillance requirement is no longer adequate, provide a schedule for: 1) revising the surveillance requirement in your technical specification to reference an acceptable surveillance methodology (e.g., ASTM E741), and 2) making any necessary modifications to your CRE so that compliance with your new surveillance requirement can be demonstrated.

If your facility does not currently have a technical specification surveillance requirement for your CRE integrity, explain how and at what frequency you confirm your CRE integrity and why this is adequate to demonstrate CRE integrity.

NMC Response To Question 1(c)

The majority of this question was answered in the August 7, 2003 response[18]. NMC committed to respond to the remainder of the question in correspondence dated November 25, 2003.[19] That commitment has been modified in the Summary of Commitments section of the cover letter. The revised commitment reads:

> "Submit to the NRC, proposed changes to the Technical Specifications based upon the final, approved version of Technical Specification Task Force (TSTF) traveler – 448, adjusted, as needed, to account for plant-specific KNPP Control Room Envelope design and licensing basis, within 180 days following NRC approval of TSTF-448."

NRC Question 2

If you currently use compensatory measures to demonstrate control room habitability, describe the compensatory measures at your facility and the corrective actions needed to retire these compensatory measures.

NMC Response To Question 2

NMC has performed analyses supporting the current operability determination associated with the CRE analysis deficiency. In order to ensure the dose consequences to control room operators remain below 5.0 rem TEDE, three compensatory measures were implemented. The first was to reduce the reactor coolant system (RCS) coolant activity limit on Dose Equivalent I-131 from ≤ 1.0 μCi/gram to ≤ 0.35 μCi/gram and the iodine spike limit from ≤ 60.0 μCi/gram to ≤ 20.0 μCi/gram. The second was to increase the radioactive methyl iodide removal acceptance criteria for the Shield Building Ventilation system and Control Room Post-Accident Recirculation

carbon filters from ≥ 95% to ≥ 97.5%. Finally, the maximum allowable leakage rate (L_a) for containment leakage was administratively reduced from 0.5 weight percent of the contained air per 24 hours to 0.3 weight percent and was further reduced to 0.2 weight percent, the current containment leak rate administrative limit.

To retire these compensatory measures NMC plans on submitting a LAR (note: this is the "new commitment" in the cover letter that corrects the non-conservative TS). The LAR will request approval of a revised radiological accident analysis using revised analysis assumptions that address the higher CRE unfiltered in-leakage and the revised limits for containment leakage, charcoal filter efficiencies, and RCS activity. The LAR will also include the appropriate KNPP TS revisions. The current compensatory measures will be retired once the NRC has approved the LAR and NMC has implemented the TS amendment.

References:

[1] Letter from John G. Lamb (NRC) to Thomas Coutu (NMC), "Kewaunee Nuclear Power Plant - Issuance of Amendment Regarding Implementation of Alternate Source Term (TAC NO. MB4596)," dated March 17, 2003, ADAMS Accession NO. ML030210062.

[2] US NRC Regulatory Guide 1.183, July 2000, Table 6, page 1.183-20

[3] Letter from John G. Lamb (NRC) to Thomas Coutu (NMC), "Kewaunee Nuclear Power Plant - Issuance of Amendment Regarding Implementation of Alternate Source Term (TAC NO. MB4596)," dated March 17, 2003, ADAMS Accession NO. ML030210062.

[4] Letter from John G. Lamb (NRC) to Thomas Coutu (NMC), transmitting issuance of Stretch Power Uprate amendment #172 (TAC No. MB4596) ans safety evaluation report dated February 27, 2004.

[5] Letter from Steven A. Varga (NRC) to C.W. Geisler (WPSC), dated July 7, 1983

[6] Letter from A. Schwencer (NRC) to E.W. James (WPS), dated December 12, 1978.

[7] Letter from Steven A. Varga (NRC) to Eugene Mathews (WPS), dated Fenruary 13, 1981.

[8] Letter from Steven A. Varga (NRC) to Eugene Mathews (WPS), dated December 22, 1981.

[9] Letter from John G. Lamb (NRC) to Thomas Coutu (NMC), "Kewaunee Nuclear Power Plant - Issuance of Amendment Regarding Implementation of Alternate Source Term (TAC NO. MB4596)," dated March 17, 2003, ADAMS Accession NO. ML030210062.

[10] Letter from John G. Lamb (NRC) to Thomas Coutu (NMC), "Kewaunee Nuclear Power Plant - Issuance of Amendment Regarding Implementation of Alternate Source Term (TAC NO. MB4596)," dated March 17, 2003, ADAMS Accession NO. ML030210062.

[11] Letter from John G. Lamb (NRC) to Thomas Coutu (NMC), transmitting issuance of Stretch Power Uprate amendment #172 (TAC No. MB4596) ans safety evaluation report dated February 27, 2004.

[12] Letter from John G. Lamb (NRC) to Thomas Coutu (NMC), transmitting issuance of Stretch Power Uprate amendment #172 (TAC No. MB4596) ans safety evaluation report dated February 27, 2004.

[13] Letter from Steven A. Varga (NRC) to C.W. Geisler (WPSC), dated July 7, 1983

[14] Letter from Steven A. Varga (NRC) to C.W. Giesler (WPSC), dated July 7, 1983

[15] US NRC Regulatory Guide 1.183, July 2000, Table 6, page 1.183-20

[16] Letter from C. R. Steinhardt (WPS) to Document Control Desk (NRC), "Submittal of Kewaunee's Updated Control Room Habitability Evaluation Report to Address NRC Concerns Over Control Room Ventilation", dated February 28, 1989.

[17] Letter from C. R. Steinhardt (WPS) to Document Control Desk (NRC), "Submittal of Kewaunee's Updated Control Room Habitability Evaluation Report to Address NRC Concerns Over Control Room Ventilation", dated February 28, 1989.

[18] Letter from Tom Coutu (NMC) to Document Control Desk (NRC), dated August 7, 2003, ADAMS Accession NO. ML032260513.

[19] Letter from Edward J. Weinkam (NMC) to Document Control Desk (NRC), dated November 25, 2003, Adams Accession NO. ML033300162.

ENCLOSURE 2

Generic Letter 2003-01
Kewaunee Nuclear Power Plant
Commitment Summary

Commitment	Where Made	How Closed
NMC will provide the schedule to perform ASTM E741 testing and the schedule for the requested response to GL 2003-01 item 1(a) for KNPP by December 5, 2003.	Reference 1	Reference 2
NMC will provide the schedule for verifying by ASTM E741 testing that the most limiting inleakage has been incorporated into the hazardous chemical assessments (GL 2003-01 item 1(b) part 1) for KNPP by December 5, 2003.	Reference 1	Reference 2
NMC will provide the results of a smoke assessment (GL 2003-01 item 1(b) part 2) for KNPP by December 5, 2003.	Reference 1	Reference 2
NMC will provide the schedule for the development of technical specification changes (and any associated plant modifications) to support requested information item 1(c) for KNPP by after the results of the ASTM E741 test are analyzed..	Reference 1	Reference 2
Perform the ASTM E741 testing [T] and, [provide] the requested response to GL 2003-01 item 1(a) Schedule for Completion: T = December 2004, T+ 90 days	Reference 2	This Submittal
Verifying by ASTM E741 testing that the most limiting inleakage has been incorporated into the hazardous chemical assessments (GL 2003-01 item 1(b) part 1) Schedule for Completion: T = December 2004, T+90 days	Reference 2	This Submittal
Development of technical specification changes (and any associated plant modifications) to support requested information GL 2003-01 item 1(c) Schedule for Completion: T = December 2004, T+120 days (2) (2) Technical Specification submittal dates are contingent on timely approval and issuance of the CLIIP [Consolidated Line Item Improvement Process] for the Technical Specification Task Force (TSTF) – 448 traveler on control room habitability. Completion dates may change based upon any plant modifications determined to be necessary by the testing. Revised commitment: Submit to the NRC, proposed changes to the Technical Specifications based upon the final, approved version of Technical Specification Task Force (TSTF) traveler – 448, adjusted, as needed, to account for plant-specific KNPP CRE design and licensing basis, within 180 days following NRC approval of TSTF-448.	This Submittal	Open
New commitment: A LAR requesting modifications to the current approved Alternate Source Term radiological analyses and the Technical Specifications (TS) will be submitted to correct the non-conservative TS by using the guidance of Administrative Letter 98-10.	This Submittal	Open

Note: The letters referenced in Enclosure 2 are the same as those in the cover letter.