NMC
Committed to Nuclear Excellence

Kewaunee Nuclear Power Plant
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Kewaunee, WI 54216-9511
920-388-2560

Operated by
Nuclear Management Company, LLC

May 2, 2001

10 CFR 50.54(q)
10 CFR 50 Appendix E (IV)(B)

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

Ladies/Gentlemen:

DOCKET 50-305
OPERATING LICENSE DPR-43
KEWAUNEE NUCLEAR POWER PLANT
LAKE MICHIGAN LOW LEVEL EMERGENCY ACTION LEVEL MODIFICATION

Modifications are being proposed to the Kewaunee Nuclear Power Plant (KNPP) Emergency Plan Emergency Action Levels (EALs). Nuclear Management Company, LLC, (NMC) believes these changes do not decrease the effectiveness of the Emergency Plan. A description of the changes and the effectiveness evaluation is included as Attachment 1 to this letter. The change to the EALs is included in attachment 2, with attachment 3 being the current EALs for Lake Michigan level. These changes are being made to the EALs and therefore require state and local government agreement with NRC approval prior to implementation in accordance with 10 CFR 50 Appendix E.

NMC has contacted the state and local governments and has received verbal agreement with these changes.

Pursuant to 10 CFR 50.4, two additional copies of this letter and attachments are submitted to the U.S. Nuclear Regulatory Commission, Region III. One copy of this letter and attachments is also submitted to the KNPP Senior Resident Inspector.

Sincerely,

Mark E. Reddemann
Site Vice President

GOR

Attach.

cc - Electric Division-PSCW w/o attach.
US NRC Senior Resident Inspector w/attach
US NRC, Region III (2 copies) w/attach.

A045

ATTACHMENT 1

Letter from Mark E. Reddemann (NMC)

To

Document Control Desk (NRC)

Dated

May 2, 2001

DESCRIPTION OF CHANGES

Description of Change

The Nuclear Management Company, LLC, (NMC) is changing the setpoints associated with the Emergency Action Levels for declaration of an Unusual Event and Alert for the Lake Michigan water level. Current declaration criteria and their setpoints are listed in Kewaunee Nuclear Power Plant (KNPP) Emergency Plan Implementing Procedure (EPIP) EPIP-AD-02, Chart O, "Flood, Low Water, or Seiche." See attachment 3 for a reproduction of EPIP-AD-02, Chart O. The current criteria and setpoints are developed from guidance/examples provided in NUREG 0654, Rev 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Appendix 1.

For a Notification of Unusual Event (NOUE), the example listed for low water level in NUREG 0654 is, "Natural Phenomenon being experienced or projected beyond usual levels." NUREG 0654 goes on to clarify this statement as "50 year flood or low water level, tsunami, hurricane surge, seiche." Using this example, the NOUE criteria setpoint for KNPP due to low lake level was set at 575'4" IGLD(85). This level corresponds to the lowest level Lake Michigan has been since 1918[(6)].

For the declaration of an Alert, the example listed for low water level in NUREG 0654 is, "Severe Natural Phenomenon being experienced or projected." NUREG 0654 goes on to clarify this statement as "flood, low water, tsunami, hurricane surge, seiche near design levels." Using this example, the Alert criteria setpoint for KNPP due to low lake level was set at 573' IGLD(85).

KNPP is designed to safely operate at lake levels lower than 573'. Therefore, the emergency classification criteria is being lowered such that a NOUE occurs at a lake level is 572.7' and the Alert level is at a lake level of 568.5'.

Background

Revision 1 to NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," was published in November 1980 to provide specific acceptance criteria for complying with the standards set forth in 10 CFR 50.47. These criteria provide a basis for NRC licensees and State and local governments to develop acceptable radiological emergency plans and improve emergency preparedness.

10 CFR 50.47 (b)(4) delineates the requirements for emergency classification. It states:

> *(4) A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.*

Section II, "Planning Standards and Evaluation Criteria," of NUREG 0654, item D, "Emergency Classification System," restates the planning standard above and provides additional guidance for

evaluation criteria. Items 1 and 2 are applicable to Licensee's and in part state:

1. An emergency classification and emergency action level scheme as set forth in Appendix 1 must be established by the licensee.

2. The initiating conditions shall include the example conditions found in Appendix 1 and all postulated accidents in the Final Safety Analysis Report (FSAR) for the nuclear facility.

Using the guidance found in Appendix 1 of NUREG 0654, KNPP developed an emergency classification system. As part of this classification system, KNPP adopted the emergency classification criteria of a NOUE and Alert as defined in NUREG 0654 for low lake level. This generated a NOUE criterion of 575 feet 4 inches, the lowest Lake Michigan has been since 1918. The Alert criterion was selected to be 573 feet, the low water level. A subsequent review of NRC correspondence determined the expected low lake level for Kewaunee is 571'[(5)].

A NRC Consultant postulated this level, 571-foot lake level elevation, as the lowest level Lake Michigan would reach. This information was relayed to Kewaunee in a NRC request for additional information. The request for additional information required Wisconsin Public Service Corporation to respond to several questions concerning the Kewaunee Nuclear Power Plant design using the postulation that Lake Michigan water level could reach a low level of 571 feet. Assuming a lake level of 571 feet, Wisconsin Public Service Corporation responded to the NRC's questions showing that the Kewaunee Nuclear Power Plant is capable of safe operation at this lake level.

Kewaunee has no direct indication of Lake Level. Therefore, forebay level is used to provide the indication of Lake Level. Since the intake structure is approximately 1750 feet from the forebay, a head loss is developed depending on fouling and the number of pumps running. Data collection has determined that with two circulating water pumps running there is a six-foot head loss, while with a single circulating water pump running this loss is three feet. With no circulating water, the forebay, and Lake Michigan levels are essentially the same.

Additionally, under severe weather conditions fouling may occur on the Traveling Water Screens that are located between the lake and the forebay indication. As these screens foul, additional head loss is developed and the forebay level to lake level relationship is unknown. Thus, the lake level may not change but, due to the increased head loss, the forebay indication may show a decrease. However past experience has demonstrated that when the circulating water pumps are off, forebay water level again is essentially the same as lake level.

With lake level gradually decreasing, KNPP is approaching the level at which an unusual event would be declared. If this where to occur there is no safety concern. Analysis and testing has shown that the plant can safely operate to a forebay level of 567.8' with no circulating water pumps running or 566[(2)] feet with circulating water pumps running. These levels assure the service water pumps have adequate net positive suction head and that vortexing will not occur. Additional conservatism is added by raising the forebay level at which an Alert is declared with no circulating water pumps operating to the 568.5 foot elevation.

Basis for Change

In Revision 3 to Regulatory Guide 1.101, the NRC stated that "Licensees may use either NUREG 0654/FEMA-REP-1 or NUMARC/NESP-007 in developing their Emergency Action Level (EAL) scheme but may not use portions of both methodologies." The staff stated in Emergency Preparedness Position (EPPOS) No. 1, "Emergency Preparedness Position (EPPOS) on Acceptable Deviations from Appendix 1 of NUREG-0654 Based upon the Staff's Regulatory Analysis of NUMARC/NESP-007, 'Methodology for Development of Emergency Action Levels'," that it recognizes that licensees who continue to use EALs based upon NUREG-0654 could benefit from the technical basis for EALs provided in NUMARC/NESP-007.

In Draft revision 4 to Regulatory Guide 1.101, the NRC staff also states that the guidance in NUMARC/NESP-007 (Revision 2, January 1992), or the guidance contained in NEI 99-01 (Draft Final Revision 4, February 2000), is acceptable to the NRC staff as an alternative method to that described in Appendix 1 to NUREG-0654/FEMA-REP-1 for developing EALs. However, the staff also recognized that the classification scheme must remain internally consistent. Likewise, licensees can benefit from guidance provided in NEI 99-01 without revising their entire EAL scheme. However, the licensee needs to ensure that its EAL scheme remains internally consistent (i.e., the EALs making up the scheme are integrated to cover the spectrum of conditions that may warrant classification in a logical manner).

In NEI 99-01, "Methodology for Development of Emergency Action Levels" it states there are three considerations related to emergency classes. These are:

(1) The potential impact on radiological safety, either as now known or as can be reasonably projected;

(2) How far the plant is beyond its predefined design, safety, and operating envelopes; and

(3) Whether or not conditions that threaten health are expected to be confined to within the site boundary.

NEI 99-01 also describes the basis for declaration of each class of events that are described below.

NOTIFICATION OF UNUSUAL EVENT: Events are in process or have occurred which indicate a potential degradation of the level of safety of the plant. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs. Potential degradation of the level of safety of the plant is indicated primarily by exceeding plant technical specification Limiting Condition of Operation (LCO) allowable action statement time for achieving required mode change. Precursors of more serious events should also be included because precursors do represent a potential degradation in the level of safety of the plant. Minor releases of radioactive materials are included. In this emergency class, however, releases do not require monitoring or offsite response (e.g., dose consequences of less than 10 millirem).

> **ALERT:** Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels. Rather than discussing the distinguishing features of "potential degradation" and "potential substantial degradation," a comparative approach would be to determine whether increased monitoring of plant functions is warranted at the Alert level as a result of safety system degradation. This addresses the operations staff's need for help, independent of whether an actual decrease in plant safety is determined. This increased monitoring can then be used to better determine the actual plant safety state, whether escalation to a higher emergency class is warranted, or whether de-escalation or termination of the emergency class declaration is warranted. Dose consequences from these events are small fractions of the EPA PAG plume exposure levels, i.e., about 10 millirem to 100 millirem TEDE.

Using the current KNPP emergency classification criteria, if Lake Michigan Water Level were to decrease to 575 feet 4 inches a NOUE would be declared. Thus, State and National agencies would be notified and mobilized, appropriate portions of the KNPP Emergency Response Organization would be mobilized when the safety of the plant would not be at risk. Although this level corresponds to the 50-year low Lake Michigan level, it is still above the Lake Michigan level at which the safe operation of KNPP is challenged.

By setting the criteria for declaration of an UE at 572.7 feet, margin is added to allow action to be taken to place the plant in a safe condition, if required. This setpoint was derived by starting at a projected low lake level of 571 feet. Based on a review of the monthly lake levels over a 10 year period the maximum change in Lake Michigan level per month was determined to be 0.56 feet. Conservatively, 0.56 feet was increased to 1.0 feet as the amount Lake Michigan level may change in one month. To account for the accuracy of the forebay level indicator (2.06%), 0.66 feet was also added. This equaled a level of 572.66 feet (571 + 1+0.66), this has been rounded up to 572.7 feet. Therefore, using 572.7 feet meets the intent of the declaration of an UE.

Likewise, selecting a forebay level of 566 feet with circulating water pumps operating or 567.8 without the circulating water pumps operating, meets the intent for declaration of an Alert. The intent of an Alert is to make a declaration when events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. NUREG 0654 also states that the setpoint for this classification is low water levels near design. The service water pumps have been shown to be capable of meeting their design basis requirements at forebay water levels of 566/567.8 feet. The 566 foot level already includes instrument inaccuracies, the 567.8 foot level does not, 0.66 feet is added to the 567.8 foot elevation to bring the setpoint to 568.47, or 568.5 foot elevation. If level is less than this, there is a potential for a loss of flow capability for the service water pumps. Therefore, using 566/568.5 feet with/without circulating water pumps running meets the intent of the declaration of an Alert.

Conclusion

The intent of declaring an Unusual Event is to notify and activate appropriate local, state, federal, and plant emergency response personnel when events are in process or have occurred which indicate a potential degradation of the level of safety of the plant. The intent of declaring an Alert is to notify and activate appropriate local, state, federal, and plant emergency response personnel when events are in process or have occurred which involve an actual or potentially substantial degradation of the level of safety of the plant.

As these changes to the EALs associated with the water level of Lake Michigan meet the intent of a UE and Alert declaration, NMC believes by implementing these changes there is no decrease in the effectiveness of the KNPP Emergency Plan. As required by 10 CFR 50 Appendix E item IV(B), changes to EALs require state and local government agreement and NRC approval prior to implementation. These changes are therefore being submitted for State and County Emergency Government agreement and NRC approval.

References:

1. NUREG 0654, Rev 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," dated November 1980.
2. Hydraulic-Model Study of Water Intake, Kewaunee Nuclear Power Plant, Wisconsin, by Iowa Institute of Hydraulic Research, Report No. 288, dated December 2000, page 17.
3. NRC FSAR question number 2.14.4 response.
4. US Army Corp of Engineer website historical data from 1988 to 1999 (http://huron.lre.usace.army.mil/levels/text/michur_hydrographs_8.txt)
5. Letter Dated March 17, 1972 from E.W. James (WPSC) to P.A. Morris (US AEC), "Information Related to Amendment 16 to the Application for Construction Permit and Operating License."
6. US Army Corp of Engineers website (http://huron.lre.usace.army.mil/levels/maxmin.html)

ATTACHMENT 2

Letter from Mark E. Reddemann (NMC)

To

Document Control Desk (NRC)

Dated

May 2, 2001

EMERGENCY PLAN (REVISED PAGES)
EPIP-AD-02, Chart 0, New Revision
FLOOD, LOW WATER, OR SEICHE

KNPP INDICATION				EMERGENCY CLASSIFICATION CRITERIA	CLASSIFICATION
FOREBAY LEVEL				Flood, low water, or seiche near design levels.	ALERT
0 PUMPS	1 PUMP	2 PUMPS	CORRESPOND TO LAKE LEVEL		
NOTE 3	NOTE 1	≥ 94%	≥ 588 ft.		
< 50%	< 42% NOTE 5	< 42% NOTE 5	< 568.5 ft.		
OR Deep water Wave ≥ 22.5 ft.					
FOREBAY LEVEL				50-year flood, low water level or seiche	UNUSUAL EVENT
0 PUMPS	1 PUMP	2 PUMPS	CORRESPOND TO LAKE LEVEL		
NOTE 2	≥ 98%	≥ 88%	≥ 586 ft.		
< 63.2%	< 56.8% NOTE 4	< 47.4% NOTE 4	< 572.7 ft.		
OR Deep water wave ≥ 18 ft.					

NOTE 1: Above the bottom of bar No. 1 painted on the south wall of the forebay.

NOTE 2: Above the bottom of bar No. 2 painted on the south wall of the forebay.

NOTE 3: Above the bottom of bar No. 3 painted on the south wall of the forebay.

NOTE 4: Applies to an uncontrollable decrease (cannot be restored by operator action. If the water box inlet valves are throttled, use other means to determine lake level per E-CW-04, of circulating water.)

NOTE 5: With circulating water pumps in operation, forebay level has been evaluated to be acceptable to the 566-foot elevation (42%)

* Computer point for forebay level is L09075A and should be used because of its greater accuracy.

Plant elevations and lake elevations are referenced to International Great Lakes Datum (IGLD), 1955

(IGLD 1955 = IGLD 1985 - 0.7 FEET)

ATTACHMENT 3

Letter from Mark E. Reddemann (NMC)

To

Document Control Desk (NRC)

Dated

May 2, 2001

EPIP-AD-02, Chart 0, Revision Z
FLOOD, LOW WATER, OR SEICHE

KNPP INDICATION				EMERGENCY CLASSIFICATION CRITERIA	CLASSIFICATION
FOREBAY LEVEL				Flood, low water, or seiche near design levels.	ALERT
0 PUMPS	1 PUMP	2 PUMPS	CORRESPOND TO LAKE LEVEL		
NOTE 3	NOTE 1	≥ 94%	≥ 588 ft.		
≤ 64%	≤ 42%	≤ 42%	≤ 573 ft.		
OR Deep water Wave ≥ 22.5 ft.					
FOREBAY LEVEL				50-year flood, low water level or seiche	UNUSUAL EVENT
0 PUMPS	1 PUMP	2 PUMPS	CORRESPOND TO LAKE LEVEL		
NOTE 2	≥ 98%	≥ 88%	≥ 586 ft.		
≤ 71%	≤ 63% NOTE 4	≤ 54% NOTE 4	≤ 575 ft. 4 in.		
OR Deep water wave ≥ 18 ft.					

NOTE 1: Above the bottom of bar No. 1 painted on the south wall of the forebay.

NOTE 2: Above the bottom of bar No. 2 painted on the south wall of the forebay.

NOTE 3: Above the bottom of bar No. 3 painted on the south wall of the forebay.

NOTE 4: Applies to an uncontrollable decrease (cannot be restored by operator action; e.g., throttling water box valves, etc.).

* Computer point for forebay level is L09075A and should be used because of its greater accuracy.

Plant elevations and lake elevations are referenced to International Great Lakes Datum (IGLD), 1955

(IGLD 1955 = IGLD 1985 - 0.7 FEET