Kewaunee Nuclear Power Plant
N490 Highway 42
Kewaunee, WI 54216-9511
920.388.2560

Point Beach Nuclear Plant
6610 Nuclear Road
Two Rivers, WI 54241
920.755.2321

NMC
Committed to Nuclear Excellence

Kewaunee / Point Beach Nuclear
Operated by Nuclear Management Company, LLC

NRC-02-007

January 14, 2002

10 CFR 50.90

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

Ladies/Gentlemen:

DOCKET 50-305
OPERATING LICENSE DPR-43
KEWAUNEE NUCLEAR POWER PLANT
PROPOSED AMENDMENT 181 TO THE KEWAUNEE NUCLEAR POWER PLANT TECHNICAL SPECIFICATIONS

The Nuclear Management Company (NMC) is submitting proposed amendment (PA) number 181 to the Kewaunee Nuclear Power Plant (KNPP) Technical Specifications (TS) to revise Section 3.10.f.

The proposed amendment submitted using MicroSoft Word reformats TS 3.10.f to more closely resemble the format of Improved Standard Technical Specification (ISTS) to improve clarity.

The proposed amendment provides an allowed outage time (AOT) for the Individual Rod Position Indicator (IRPI) system of 24 hours with more than one IRPI per group inoperable. The TS did not previously have an explicit AOT for this condition.

The health and safety of the public will not be adversely affected by the proposed change because the rod motion and relative rod position can still be monitored by other systems including demand step counters, incore detectors, excore detectors, or thermocouples. The change to the AOT from 0 to 24 hours is acceptable because of these redundant systems monitoring the incore parameters ensures safe operation of the reactor and the AOT is consistent with ISTS.

This proposed amendment is not needed for continued plant operation and does not contain proprietary information. Attachment 1 to this letter contains a description, a safety evaluation, a significant hazards determination, and environmental considerations for the proposed changes. Attachment 2 contains the strikeout TS pages: TS ii and TS 3.10-8 through TS 3.10-12. Attachment 3 contains the affected TS pages: TS ii and 3.10-8 through 3.10-12. Attachment 4 contains the strikeout TS Bases pages: B3.10-8 through B3.10-10. Attachment 5 contains the affected TS Bases pages: B3.10-8 through B3.10-10.

A001

In attachment 2, Strikeout TS pages, additions to the specifications are double underlined while deletions are ~~strikeout~~.

In accordance with the requirements of 10 CFR 50.30(b), this submittal has been signed and notarized. A complete copy of this submittal has been transmitted to the State of Wisconsin as required by 10 CFR 50.91(b)(1).

Sincerely,

A. J. Cayia for
Mark E. Reddemann
Site Vice President

tlm

Attachments

cc - US NRC - Region III
US NRC Senior Resident Inspector
Electric Division, PSCW

Subscribed to and Sworn Before Me
This 14th Day January 2002

Notary Public, State of Wisconsin

My Commission Expires: November 6, 2005

ATTACHMENT 1

Letter from M. E. Reddemann (NMC)

to

Document Control Desk (NRC)

Dated

January 14, 2002

Proposed Amendment 181

Description of Proposed Changes

Safety Evaluation

Significant Hazards Determination

Environmental Considerations

Description of Proposed Changes

The majority of these change to Kewaunee Technical Specification (TS) 3.10.f are administrative in nature. The TS has been reformatted to resemble the Improved Standard Technical Specification (ISTS) format to improve clarity. The allowed outage time (AOT) will be increased to 24 hours when more than one the Individual Rod Position Indicator (IRPI) per group is found to be out of service (OOS). This will prevent unnecessary mode changes due to minor equipment problems which can be quickly corrected and pose no safety concern. The 24 hour AOT will include a limiting condition for operation (LCO) that the rod control system be immediately moved to manual and the reactor coolant temperature be logged hourly during the AOT.

Background

Individual rod position indicators (IRPI's) are electrical devices located above the reactor head which measure movement of the control rods as they are removed from or inserted into the core. They are just one of several ways which the control room operators monitor the reactor to ensure that it is functioning properly. The control rods are arranged into groups of 2-4 rods and are combined into banks with one or two groups per bank. The banks are designed to move in unison to ensure uniform reactivity changes in the reactor core. Currently KNPP TS do not allow an outage time if more than one IRPI channel per group is OOS. If two or more IRPI channels per group are OOS, the operators are required to shutdown the plant per the standard shutdown sequence TS 3.0.c.

This change will allow KNPP to troubleshoot and repair more than one malfunctioning IRPI per group thus preventing an unnecessary plant transition.

Safety Evaluation for Proposed Change

The proposed change can be described in two parts. The first is the administrative format change to the new ISTS format using Microsoft Word software, which has no safety significance. The second part is to establish a Limiting Condition of Operation (LCO) and Allowed Outage Time (AOT) of 24 hours when more than one IRPI channel per group is inoperable. All of the requirements of the original technical specification, except those changed by this submittal, remain in effect.

This proposed TS change was developed from ISTS, NUREG 1431, Standard Technical Specification – Westinghouse Plants, Revision 2, dated 4/30/2001. Modifications incorporated from NUREG 1431 include placing the Rod Control System in manual, monitoring and recording reactor coolant temperature and additional surveillance requirements. Placing the Rod Control System in manual ensures unplanned rod motion will not occur. The immediate completion time for placing rod control in manual reflects the urgency with which unplanned rod motion must be prevented while in this condition. Monitoring and recording reactor coolant temperature helps ensure that significant changes in power are observed thus ensuring significant changes in power distribution are monitored and maintained within limits. The additional surveillance requirements added for the AOT are there to cover the loss of information when the IRPI(s) are OOS. The once per hour interval is acceptable because only minor fluctuations in reactor coolant system (RCS) temperature are expected at steady state plant operating conditions.

These changes are considered acceptable because the health and safety risk to the public will not be adversely affected. This is because movement and relative location of the rods can still be monitored by the demand step counters, incore detectors, excore detectors, or core exit thermocouples. The purpose for monitoring rod position is to ensure the rods are aligned within specific tolerances. The specific tolerances for rod alignment are set to ensure hot channel factor limits are maintained during periods when the core neutron flux distribution is not being monitored and changes are taking place in the core. The aforementioned indicators provide indication of the positions of the rods or indication of the flux distribution, thus ensure core power distribution limits are maintained during power operation. KNPP licensing bases has always taken credit for the ability to monitor the power tilt using this alternate core instrumentation to determine rod position and/or core power distribution. Shutdown requirements for the reactor are still monitored by other applicable sections of the TS such as TS 2.3.a - Reactor Trip Settings and TS 3.10 - Control Rod & Power Distribution Limits.

NMC concludes that neither the format changes to this TS nor the increased AOT to restore the inoperable IRPI's when more that one per group are inoperable, has an adverse impact on plant or public safety.

Significant Hazards Determination for Proposed Change

The IRPI provides a continuous rod position indication for each control rod through the entire range of travel. Individual rod position is detected magnetically and is dependent on the position of the top of the drive shaft within the rod travel housing. IRPI analog displays developed from a signal conditioning module are provided on a verticle control console in the control room. The plant process computer also receives the individual rod positions from the IRPI system signal conditioning module and provides operators with indication of individual rod position. This rod position information from the IRPI's as well as demand step counters, incore detectors, excore detectors, or core exit thermocouples are used by the control room operators to determine the overall status of the reactor.

The proposed changes were reviewed in accordance with the provisions of 10 CFR 50.92 to determine that no significant hazards exist. The proposed changes will not:

1. **Involve a significant increase in the probability or consequences of an accident previously evaluated.**

   The format changes are administrative in nature and, therefore, have no effect on the probability or consequences of an accident. The individual rod position indicator (IRPI) system is not an accident initiator. Therefore, any change to the system would not effect the probability of an accident previously evaluated. The risk of core damage/release of radioactivity would not increase with the other reactor condition monitors still functional along with the plant mode remaining the same.

The proposed change provides more time to troubleshoot and restore the system, which would keep the reactor in a steady state condition, rather than to challenge the plant with a reduction in power. The addition of hourly reactor temperature checks as well as placing the rod controls to manual are added to temporarily increase the surveillance on the reactor due to loss of the IRPI system during the IRPI AOT. Since IRPI's are not an accident initiator and since compensatory measures have been added to ensure rod position is known in case one or more IRPI's are inoperable, this amendment does not involve a increase in the probability or consequences of an accident previously evaluated.

2. **Create the possibility of a new or different kind of accident from any accident previously evaluated.**

The format changes are administrative in nature and, therefore, have no effect on the probability or consequences of a new or different kind of accident from any accident previously evaluated. The primary function of the IRPI system is to monitor the position of each rod and send that information to the control room. A failure of this system will not result in an accident.

The proposed change does not involve a change to the physical plant or operations. Operations currently monitors power tilt, excore detectors, thermocouples, and rod movement when IRPIs become inoperable. The extra surveillance requirements added by the ISTS for the AOT are there to cover the loss of information when the IRPI(s) are OOS. The change to 24 hours for troubleshooting when more than one IRPI channel per group is inoperable would, therefore, not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. **Involve a significant reduction in the margin of safety.**

The format changes are administrative in nature and, therefore, are not involved in a significant reduction in the margin of safety. Margin of safety relates to actual rod position in relation to each other. This margin is controlled by rod misalignment requirements. The IRPI's provide indication of that position which the operators have other means of determining should the need arise. The implementation of this proposed amendment ensures continued close monitoring of rod position but also adds hourly documentation of the reactor coolant temperature requirement as well. The proposed change provides more time to troubleshoot and restore the system, which would keep the reactor in a steady state condition, rather than to challenge the plant with a reduction in power.. Therefore, NMC concludes that there is not a significant reduction in the margin of safety.

Environmental Considerations

The NMC has determined that the proposed amendment involves no significant hazard considerations. There are no changes in the types of any effluents that may be released offsite and that there are no increases in the individual or cumulative occupational radiation exposure. Accordingly, this proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with this proposed amendment.

ATTACHMENT 2

Letter from M. E. Reddemann (NMC)

To

Document Control Desk (NRC)

Dated

January 14, 2002

Proposed Amendment 181

Strikeout TS Page:

TS ii

TS 3.10-8 through TS 3.10-12

2. When reactor power is < 85% but ≥ 50% of rating, the rod cluster control assemblies shall be maintained within ± 24 steps from their respective banks. If a rod cluster control assembly is misaligned from its bank by more than ± 24 steps when reactor power is < 85% but ≥ 50%, the rod will be realigned or the core power peaking factors shall be determined within 4 hours, and TS 3.10.b applied. If the peaking factors are not determined within 4 hours, the reactor power shall be reduced to < 50% of rating.

3. And, in addition to TS 3.10.e.1 and TS 3.10.e.2, if the misaligned rod cluster control assembly is not realigned within 8 hours, the rod shall be declared inoperable.

~~f. Inoperable Rod Position Indicator Channels~~

~~1. If a rod position indicator channel is out of service, then:~~

~~A. For operation between 50% and 100% of rating, the position of the rod cluster control shall be checked indirectly by core instrumentation (excore detector and/or thermocouples and/or movable incore detectors) at least once per 8 hours, or subsequent to rod motion exceeding a total displacement of 24 steps, whichever occurs first.~~

~~B. During operation < 50% of rating, no special monitoring is required.~~

~~2. Not more than one rod position indicator channel per group nor two rod position indicator channels per bank shall be permitted to be inoperable at any time.~~

~~3. If a rod cluster control assembly having a rod position indicator channel out of service is found to be misaligned from TS 3.10.f.1.A, then TS 3.10.e will be applied.~~

3.10 CONTROL ROD AND DISTRIBUTION LIMITS

3.10.f Rod Position Indication

LCO 3.10.f The Individual Rod Position Indicator (IRPI) System shall be OPERABLE.

APPLICABILITY: OPERATING & HOT STANDBY

ACTIONS

NOTE

Separate Condition entry is allowed for each inoperable rod position indicator.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One IRPI per group inoperable for one or more groups.	A.1 Verify the position of the rods with inoperable position indicators indirectly by using core instrumentation (excore detector, or thermocouples, or movable incore detectors).	Once per 8
	OR	
	A.2 Reduce thermal power to ≤ 50% RATED POWER.	8 hours
B. More than one IRPI per group inoperable.	B.1 Place the control rods under manual control.	Immediately
	AND	
	B.2 Monitor and Record RCS T_{avg}	Once per 1 hour
	AND	
	B.3 Verify the position of the rods with inoperable position indicators indirectly by using core instrumentation (excore detector, or thermocouples, or movable incore detectors).	Once per 8 hours
	AND	
	B.4 Restore inoperable position indicators to OPERABLE status such that a maximum of one IRPI per group is inoperable.	24 hours

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more rods with inoperable position indicators have been moved in excess of 24 steps in one direction since the last determination of the rod's position.	C.1 Verify the position of the rods with inoperable position indicators indirectly by using core instrumentation (excore detector, or thermocouples, or movable incore detectors).	8 hours
	OR	
	C.2 Reduce thermal power to ≤ 50% RATED POWER.	8 hours
D. Required action and associated completion time not met.	D.1 Be in HOT SHUTDOWN	6 hours

g. Inoperable Rod Limitations

1. An inoperable rod is a rod which does not trip or which is declared inoperable under TS 3.10.e or TS 3.10.h.

2. Not more than one inoperable full length rod shall be allowed at any time.

3. If reactor operation is continued with one inoperable full length rod, the potential ejected rod worth and associated transient power distribution peaking factors shall be determined by analysis within 30 days unless the rod is made OPERABLE earlier. The analysis shall include due allowance for nonuniform fuel depletion in the neighborhood of the inoperable rod. If the analysis results in a more limiting hypothetical transient than the cases reported in the safety analysis, the plant power level shall be reduced to an analytically determined part power level which is consistent with the safety analysis.

h. Rod Drop Time

At OPERATING temperature and full flow, the drop time of each full length rod cluster control shall be no greater than 1.8 seconds from loss of stationary gripper coil voltage to dashpot entry. If drop time is > 1.8 seconds, the rod shall be declared inoperable.

i. Rod Position Deviation Monitor

If the rod position deviation monitor is inoperable, individual rod positions shall be logged at least once per 8 hours after a load change > 10% of rated power or after > 24 steps of control rod motion.

j. Quadrant Power Tilt Monitor

If one or both of the quadrant power tilt monitors is inoperable, individual upper and lower excore detector calibrated outputs and the quadrant tilt shall be logged once per shift and after a load change > 10% of rated power or after > 24 steps of control rod motion. The monitors shall be set to alarm at 2% tilt ratio.

k. Core Average Temperature

During steady-state power operation, T_{ave} shall be maintained < 568.8 °F, except as provided by TS 3.10.n.

l. Reactor Coolant System Pressure

During steady-state power operation, Reactor Coolant System pressure shall be maintained > 2205 psig, except as provided by TS 3.10.n.

m. Reactor Coolant Flow

1. During steady-state power operation, reactor coolant flow rate shall be $\geq$93,000 gallons per minute average per loop. If reactor coolant flow rate is < 93,000 gallons per minute per loop, action shall be taken in accordance with TS 3.10.n.

2. Compliance with this flow requirement shall be demonstrated by verifying the reactor coolant flow during initial power escalation following each REFUELING, between 70% and 95% power with plant parameters as constant as practical.

n. DNBR Parameters

If, during power operation any of the conditions of TS 3.10.k, TS 3.10.l, or TS 3.10.m.1 are not met, restore the parameter in 2 hours or less to within limits or reduce power to < 5% of thermal rated power within an additional 6 hours. Following analysis, thermal power may be raised not to exceed a power level analyzed to maintain a DNBR greater than the minimum DNBR limit.

ATTACHMENT 3

Letter from M. E. Reddemann (NMC)

To

Document Control Desk (NRC)

Dated

January 14, 2002

Proposed Amendment 181

Affected TS Pages:

TS ii

TS 3.10-8 through TS 3.10-12

2. When reactor power is < 85% but ≥ 50% of rating, the rod cluster control assemblies shall be maintained within ± 24 steps from their respective banks. If a rod cluster control assembly is misaligned from its bank by more than ± 24 steps when reactor power is < 85% but ≥ 50%, the rod will be realigned or the core power peaking factors shall be determined within 4 hours, and TS 3.10.b applied. If the peaking factors are not determined within 4 hours, the reactor power shall be reduced to < 50% of rating.

3. And, in addition to TS 3.10.e.1 and TS 3.10.e.2, if the misaligned rod cluster control assembly is not realigned within 8 hours, the rod shall be declared inoperable.

3.10 CONTROL ROD AND DISTRIBUTION LIMITS

3.10.f Rod Position Indication

LCO 3.10.f The Individual Rod Position Indicator (IRPI) System shall be OPERABLE.

APPLICABILITY: OPERATING & HOT STANDBY

ACTIONS

NOTE

Separate Condition entry is allowed for each inoperable rod position indicator.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One IRPI per group inoperable for one or more groups.	A.1 Verify the position of the rods with inoperable position indicators indirectly by using core instrumentation (excore detector, or thermocouples, or movable incore detectors).	Once per 8
	OR	
	A.2 Reduce thermal power to $\leq$50% RATED POWER.	8 hours
B. More than one IRPI per group inoperable.	B.1 Place the control rods under manual control.	Immediately
	AND	
	B.2 Monitor and Record RCS T_{avg}	Once per 1 hour
	AND	
	B.3 Verify the position of the rods with inoperable position indicators indirectly by using core instrumentation (excore detector, or thermocouples, or movable incore detectors).	Once per 8 hours
	AND	
	B.4 Restore inoperable position indicators to OPERABLE status such that a maximum of one IRPI per group is inoperable.	24 hours

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more rods with inoperable position indicators have been moved in excess of 24 steps in one direction since the last determination of the rod's position.	C.1 Verify the position of the rods with inoperable position indicators indirectly by using core instrumentation (excore detector, or thermocouples, or movable incore detectors).	8 hours
	<u>OR</u>	
	C.2 Reduce thermal power to ≤50% RATED POWER.	8 hours
D. Required action and associated completion time not met.	D.1 Be in HOT SHUTDOWN	6 hours

g. Inoperable Rod Limitations

1. An inoperable rod is a rod which does not trip or which is declared inoperable under TS 3.10.e or TS 3.10.h.

2. Not more than one inoperable full length rod shall be allowed at any time.

3. If reactor operation is continued with one inoperable full length rod, the potential ejected rod worth and associated transient power distribution peaking factors shall be determined by analysis within 30 days unless the rod is made OPERABLE earlier. The analysis shall include due allowance for nonuniform fuel depletion in the neighborhood of the inoperable rod. If the analysis results in a more limiting hypothetical transient than the cases reported in the safety analysis, the plant power level shall be reduced to an analytically determined part power level which is consistent with the safety analysis.

h. Rod Drop Time

At OPERATING temperature and full flow, the drop time of each full length rod cluster control shall be no greater than 1.8 seconds from loss of stationary gripper coil voltage to dashpot entry. If drop time is > 1.8 seconds, the rod shall be declared inoperable.

i. Rod Position Deviation Monitor

If the rod position deviation monitor is inoperable, individual rod positions shall be logged at least once per 8 hours after a load change > 10% of rated power or after > 24 steps of control rod motion.

j. Quadrant Power Tilt Monitor

If one or both of the quadrant power tilt monitors is inoperable, individual upper and lower excore detector calibrated outputs and the quadrant tilt shall be logged once per shift and after a load change > 10% of rated power or after > 24 steps of control rod motion. The monitors shall be set to alarm at 2% tilt ratio.

k. Core Average Temperature

During steady-state power operation, T_{ave} shall be maintained < 568.8 °F, except as provided by TS 3.10.n.

l. Reactor Coolant System Pressure

During steady-state power operation, Reactor Coolant System pressure shall be maintained > 2205 psig, except as provided by TS 3.10.n.

m. Reactor Coolant Flow

1. During steady-state power operation, reactor coolant flow rate shall be ≥93,000 gallons per minute average per loop. If reactor coolant flow rate is < 93,000 gallons per minute per loop, action shall be taken in accordance with TS 3.10.n.

2. Compliance with this flow requirement shall be demonstrated by verifying the reactor coolant flow during initial power escalation following each REFUELING, between 70% and 95% power with plant parameters as constant as practical.

n. DNBR Parameters

If, during power operation any of the conditions of TS 3.10.k, TS 3.10.l, or TS 3.10.m.1 are not met, restore the parameter in 2 hours or less to within limits or reduce power to < 5% of thermal rated power within an additional 6 hours. Following analysis, thermal power may be raised not to exceed a power level analyzed to maintain a DNBR greater than the minimum DNBR limit.

ATTACHMENT 4

Letter from M. E. Reddemann (NMC)

to

Document Control Desk (NRC)

Dated

January 14, 2002

Proposed Amendment 181

Strikeout TS Bases Pages:

TS B3.10-8 through TS B3.10-10

Inoperable Rod Position Indicator Channels (TS 3.10.f)

The rod position indicator channel is sufficiently accurate to detect a rod ± 12 steps away from its demand position. If the rod position indicator channel is not OPERABLE, then the operator will be fully aware of the inoperability of the channel, and special surveillance of core power tilt indications, using established procedures and relying on excore nuclear detectors, and/or movable incore detectors, will be used to verify power distribution symmetry.

The requirements on the IRPI are only applicable while OPERATING and at HOT STANDBY because these are the only MODES in which power is generated, and the operability and alignment of rods have the potential to affect the safety of the plant. In the shutdown MODES, the operability of the shutdown and control banks has the potential to affect the required shutdown margin, but this effect can be compensated for by an increase in the boron concentration of the Reactor Coolant System (RCS). The actions table is modified by a note indicating that a separate condition entry is allowed for each inoperable rod position.
This is acceptable because the required actions for each condition provide appropriate compensatory actions for each inoperable position indicator.

A.1
When one IRPI channel per group fails, the position of the rod may still be determined (~~verfied~~verified) indirectly by use of core instrumentation which includes excore detectors, thermocouples, or movable incore detectors. The bases for TS 3.10.b describes that verification of height dependent nuclear flux hot channel factor, nuclear enthalpy rise hot channel factor, and shutdown margin are primarily accomplished by using the movable incore detector but can also be determined by the excore detectors~~ and thermocouples~~. Based on experience, normal power operation does not require excessive movement of banks. If a bank has been significantly moved, the required action of C.1 or C.2 is required. Therefore, verification of rod cluster control assembly (RCCA) position within the completion time of eight hours is adequate for allowing continued full power operation, since the probability of simultaneously having a rod significantly out of position and an event sensitive to that rod position is small.

A.2
Reduction of RATED POWER to ≤ 50% puts the core into a condition where rod position is not significantly affecting core peaking factors. The allowed completion time of eight hours is reasonable based on OPERATING experience, for reducing power to ≤ 50% RATED POWER form full power conditions without challenging plant systems and allowing for rod position determination by required action A.1 above.

B.1, B.2, B.3, and B.4

When more than one IRPI per group fail, additional actions are necessary to ensure that acceptable power distribution limits are maintained, minimum SDM is maintained, and the potential effects of rod misalignment on associated accident analyses are limited. Placing the Rod Control System in manual ensures unplanned rod motion will not occur. Together with the indirect position determination available via core instrumentation will minimize the potential for rod misalignment. The immediate completion time for placing the Rod Control System in manual reflects the urgency with which unplanned rod motion must be prevented while in this condition. Monitoring and recording reactor coolant T_{avg} ensures that significant changes in power distribution and SDM are avoided. The once per hour completion time is acceptable because only minor fluctuations in Reactor Coolant System temperature are expected at steady state plant OPERATING conditions. The position of the rods may be determined indirectly by use of the core instrumentation. ~~The required action may also be satisfied by ensuring at least once per eight hours that shutdown margin is within the limits provided in the TS, provided the non-indicating rods have not been moved.~~ Verification of control rod position once per eight hours is adequate for allowing continued full power operation for a limited 24 hour period since the probability of simultaneously having a rod significantly out of position and an event sensitive to that rod position is small. The 24 hour completion time provides sufficient time to troubleshoot and restore the IRPI system to operation while avoiding the plant challenges associated with the shutdown without full rod position indication. Based on OPERATING experience, normal power operation does not require excessive rod movement. If one or more rods has been significantly (> 24 steps) moved, the required action of C.1 and C.2 below is required.

C.1 and C.2

These required actions clarify that when one or more rods with inoperable position indicators have been moved in excess of 24 steps in one direction since the position was last determined, the required actions of A.1 and A.2, or B.1, as applicable, are still appropriate but must be initiated promptly under required action C.1 to begin verifying that these rods are still properly positioned, relative to their group positions. If, within eight hours, the rod positions have not been determined, thermal power must be reduced to ≤ 50% RATED POWER within eight hours to avoid undesirable power distributions that could result from continued operation at >50% RATED POWER, if one or more rods are misaligned by more than 24 steps. The allowed completion time of eight hours provides an acceptable period of time to verify the rod positions.

D.1

If the required actions cannot be completed within the associated completion time, then the plant must be brought to a MODE in which the requirement does not apply. To achieve this status, the plant must be brought to a HOT SHUTDOWN within six hours. The allowed completion time is reasonable, based on OPERATING experience, for reaching the required MODE from full power conditions in an orderly manner and without challenging plant systems.

Inoperable Rod Limitations (TS 3.10.g)

One inoperable control rod is acceptable provided the potential consequences of accidents are not worse than the cases analyzed in the safety analysis report. A 30-day period is provided for the reanalysis of all accidents sensitive to the changed initial condition.

Rod Drop Time (TS 3.10.h)

The required drop time to dashpot entry is consistent with safety analysis.

Core Average Temperature (TS 3.10.k)

The core average temperature limit is consistent with the safety analysis.

Reactor Coolant System Pressure (TS 3.10.1)

The reactor coolant system pressure limit is consistent with the safety analysis.

Reactor Coolant Flow (TS 3.10.m)

The reactor coolant flow limit is consistent with the safety analysis.

DNBR Parameters (TS 3.10.n)

The DNBR related safety analyses make assumptions on reactor temperature, pressure, and flow. In the event one of these parameters does not meet the TS 3.10.k, TS 3.10.l or TS 3.10.m limits, an analysis can be performed to determine a power level at which the MDNBR limit is satisfied.

Two departure from nucleate boiling ratio (DNBR) correlations used in the safety analyses: the high thermal performance (HTP) DNBR correlation and the W-3 DNBR correlation. The HTP correlation applies to Siemens Power Corporation (SPC) fuel with HTP spacers. The W-3 correlation is used for the analysis of non-HTP fuel designs and for all fuel designs at low pressure and temperature conditions (e.g., the conditions analyzed during a main steam line break accident). Both DNBR correlations have been qualified and approved for application to Kewaunee. The minimum DNBR limits are 1.14 for the HTP correlation and 1.30 for the W-3 correlation.

ATTACHMENT 5

Letter from M. E. Reddemann (NMC)

to

Document Control Desk (NRC)

Dated

January 14, 2002

Proposed Amendment 181

Affected TS Bases Pages:

TS B3.10-8 through TS B3.10-10

Inoperable Rod Position Indicator Channels (TS 3.10.f)

The rod position indicator channel is sufficiently accurate to detect a rod ± 12 steps away from its demand position. If the rod position indicator channel is not OPERABLE, then the operator will be fully aware of the inoperability of the channel, and special surveillance of core power tilt indications, using established procedures and relying on excore nuclear detectors, and/or movable incore detectors, will be used to verify power distribution symmetry.

The requirements on the IRPI are only applicable while OPERATING and at HOT STANDBY because these are the only MODES in which power is generated, and the operability and alignment of rods have the potential to affect the safety of the plant. In the shutdown MODES, the operability of the shutdown and control banks has the potential to affect the required shutdown margin, but this effect can be compensated for by an increase in the boron concentration of the Reactor Coolant System (RCS). The actions table is modified by a note indicating that a separate condition entry is allowed for each inoperable rod position.
This is acceptable because the required actions for each condition provide appropriate compensatory actions for each inoperable position indicator.

A.1
When one IRPI channel per group fails, the position of the rod may still be determined (verified) indirectly by use of core instrumentation which includes excore detectors, thermocouples, or movable incore detectors. The bases for TS 3.10.b describes that verification of height dependent nuclear flux hot channel factor, nuclear enthalpy rise hot channel factor, and shutdown margin are primarily accomplished by using the movable incore detector but can also be determined by the excore detectors. Based on experience, normal power operation does not require excessive movement of banks. If a bank has been significantly moved, the required action of C.1 or C.2 is required. Therefore, verification of rod cluster control assembly (RCCA) position within the completion time of eight hours is adequate for allowing continued full power operation, since the probability of simultaneously having a rod significantly out of position and an event sensitive to that rod position is small.

A.2
Reduction of RATED POWER to ≤50% puts the core into a condition where rod position is not significantly affecting core peaking factors. The allowed completion time of eight hours is reasonable based on OPERATING experience, for reducing power to ≤50% RATED POWER form full power conditions without challenging plant systems and allowing for rod position determination by required action A.1 above.

B.1, B.2, B.3, and B.4
When more than one IRPI per group fail, additional actions are necessary to ensure that acceptable power distribution limits are maintained, minimum SDM is maintained, and the potential effects of rod misalignment on associated accident analyses are limited. Placing the Rod Control System in manual ensures unplanned rod motion will not occur. Together with the indirect position determination available via core instrumentation will minimize the potential for rod misalignment. The immediate completion time for placing the Rod Control System in manual reflects the urgency with which unplanned rod motion must be prevented while in this condition. Monitoring and recording reactor coolant T_{avg} ensures that significant changes in power distribution and SDM are avoided. The once per hour completion time is acceptable because only minor fluctuations in Reactor Coolant System temperature are expected at steady state plant OPERATING conditions. The position of the rods may be determined indirectly by use of the core instrumentation.. Verification of control rod position once per eight hours is adequate for allowing continued full power operation for a limited 24 hour period since the probability of simultaneously having a rod significantly out of position and an event sensitive to that rod position is small. The 24 hour completion time provides sufficient time to troubleshoot and restore the IRPI system to operation while avoiding the plant challenges associated with the shutdown without full rod position indication. Based on OPERATING experience, normal power operation does not require excessive rod movement. If one or more rods has been significantly (> 24 steps) moved, the required action of C.1 and C.2 below is required.

C.1 and C.2
These required actions clarify that when one or more rods with inoperable position indicators have been moved in excess of 24 steps in one direction since the position was last determined, the required actions of A.1 and A.2, or B.1, as applicable, are still appropriate but must be initiated promptly under required action C.1 to begin verifying that these rods are still properly positioned, relative to their group positions. If, within eight hours, the rod positions have not been determined, thermal power must be reduced to ≤50% RATED POWER within eight hours to avoid undesirable power distributions that could result from continued operation at >50% RATED POWER, if one or more rods are misaligned by more than 24 steps. The allowed completion time of eight hours provides an acceptable period of time to verify the rod positions.

D.1
If the required actions cannot be completed within the associated completion time, then the plant must be brought to a MODE in which the requirement does not apply. To achieve this status, the plant must be brought to a HOT SHUTDOWN within six hours. The allowed completion time is reasonable, based on OPERATING experience, for reaching the required MODE from full power conditions in an orderly manner and without challenging plant systems.

Inoperable Rod Limitations (TS 3.10.g)

One inoperable control rod is acceptable provided the potential consequences of accidents are not worse than the cases analyzed in the safety analysis report. A 30-day period is provided for the reanalysis of all accidents sensitive to the changed initial condition.

Rod Drop Time (TS 3.10.h)

The required drop time to dashpot entry is consistent with safety analysis.

Core Average Temperature (TS 3.10.k)

The core average temperature limit is consistent with the safety analysis.

Reactor Coolant System Pressure (TS 3.10.1)

The reactor coolant system pressure limit is consistent with the safety analysis.

Reactor Coolant Flow (TS 3.10.m)

The reactor coolant flow limit is consistent with the safety analysis.

DNBR Parameters (TS 3.10.n)

The DNBR related safety analyses make assumptions on reactor temperature, pressure, and flow. In the event one of these parameters does not meet the TS 3.10.k, TS 3.10.l or TS 3.10.m limits, an analysis can be performed to determine a power level at which the MDNBR limit is satisfied.

Two departure from nucleate boiling ratio (DNBR) correlations used in the safety analyses: the high thermal performance (HTP) DNBR correlation and the W-3 DNBR correlation. The HTP correlation applies to Siemens Power Corporation (SPC) fuel with HTP spacers. The W-3 correlation is used for the analysis of non-HTP fuel designs and for all fuel designs at low pressure and temperature conditions (e.g., the conditions analyzed during a main steam line break accident). Both DNBR correlations have been qualified and approved for application to Kewaunee. The minimum DNBR limits are 1.14 for the HTP correlation and 1.30 for the W-3 correlation.