NRC-00-019

Wisconsin Public Service Corporation
(a subsidiary of WPS Resources Corporation)
Kewaunee Nuclear Power Plant
North 490, Highway 42
Kewaunee, WI 54216-9511
920-388-2560

March 2, 2000

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 170 to the Kewaunee Nuclear Power Plant Technical Specifications

This proposed amendment (PA) to the Kewaunee Nuclear Power Plant (KNPP) Technical Specifications (TS) will increase the minimum refueling boron concentration value of 2100 ppm given in TS 3.8.a.5 to 2200 ppm. The increase in boron concentration is required to ensure 5% Δk/k shutdown margin during refueling due to the increased feed fuel loadings since KNPP's change from 12 month to 18-month cycles in 1995.

During the preparation of the Reload Safety Evaluation for Cycle 24 in 1999, it was determined a refueling boron concentration of 2100 ppm, as described in TS 3.8.a.5, will no longer be adequate to maintain 5% Δk/k shutdown margin with the cycle 24 reload core. Subsequent calculations were performed to determine a required boron concentration. These calculations, completed in February of 2000, determined a boron concentration of 2200 ppm ensures a 5% Δk/k shutdown margin; therefore, no reduction in safety margin occurs. As a result, this proposed change is being submitted.

Wisconsin Public Service Corporation (WPSC) will implement administrative controls to ensure the refueling boron concentration remains above 2200 ppm.

Attachment 1 to this letter contains a description, a safety evaluation, a significant hazards determination and environmental considerations for the proposed change. Attachment 2 contains the following affected TS pages: TS 3.8-2 and TS B3.8-1.

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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,

for

Mark L. Marchi
Vice President-Nuclear

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Attach.

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

Subscribed and Sworn to
Before Me This 2nd Day
of March 2000

Notary Public, State of Wisconsin

My Commission Expires:
June 8, 2003

ATTACHMENT 1

Letter M. L. Marchi (WPSC)

To

Document Control Desk (NRC)

Dated

March 2, 2000

Proposed Amendment 170

Description of Proposed Changes

Safety Evaluation

Significant Hazards Determination

Environmental Considerations

Introduction

The revision in this proposed Technical Specification increases the refueling boron concentration from 2100 ppm to 2200 ppm. This proposed change will ensure 5% shutdown margin during refueling for Cycle 24. The increase in excess reactivity to support the extended cycle requires the increase in refueling boron concentration to maintain the required shutdown margin. The proposed change in this amendment and the corresponding assessments are applicable to Cycle 24 and subsequent cycles of operation that are bounded by the conditions of the assessment.

The proposed Technical Specification change supports Cycle 24 reload changes and ensures consistency in reload design, safety analyses, and the technical specification operating limits. A description of the change follows:

Description of Proposed Change to Technical Specification (TS) 3.8, "Refueling Operations"

TS Section 3.8 is being revised as follows:

1) Paragraph 3.8.a.5 is revised to increase the minimum boron concentration that shall be maintained in the Reactor Coolant System when there is fuel in the reactor during reactor vessel head removal or while loading or unloading fuel from the reactor from 2100 ppm to 2200 ppm.

2) The Basis section is being revised accordingly and is being submitted for information.

Safety Evaluation for Proposed Change to TS 3.8.a.5

The minimum boron concentration that shall be maintained in the Reactor Coolant System when there is fuel in the reactor during reactor vessel head removal or while loading or unloading fuel from the reactor has been increased from 2100 ppm to 2200 ppm.

A change to the value of the refueling boron concentration is not an accident initiator nor will it increase the probability of an accident previously evaluated or introduce a new type of accident. The increase in refueling boron concentration ensures the shutdown margin.

The change will not impact plant equipment important to safety. Equipment important to safety will continue to operate within its design capabilities. Therefore, the change does not increase the probability of occurrence or increase the consequences of a malfunction of equipment important to safety previously evaluated in the USAR.

The proposed change does not alter the plant configuration, operating set points, or overall plant performance. Therefore, it does not create the possibility of a new or different kind of accident.

Significant Hazards Determination for Proposed Change to TS 3.8.a.5

The proposed change was reviewed in accordance with the provisions of 10 CFR 50.92 to show no significant hazards exist. The proposed change will not:

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

   The refueling boron concentration value is not an accident initiator. Therefore, the change will not increase the probability of an accident previously evaluated. The proposed change to the refueling boron concentration value does not alter the plant configuration, operating set points, or overall plant performance. As was the case prior to the change, when there is fuel in the reactor, a 5% Δk/k shutdown margin will be maintained in the reactor coolant system during reactor vessel head removal or while loading and unloading fuel from the reactor.

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

   The proposed change in the refueling boron concentration value does not alter the plant configuration, operating set points, or overall plant performance. The proposed change will ensure a 5% Δk/k shutdown margin will be maintained as currently described in TS. Therefore, it does 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 proposed change in the refueling boron concentration value continue to ensure that the current TS 3.8.a.5 shutdown requirement of 5% Δk/k shutdown margin will be maintained in the Reactor Coolant System during reactor vessel head removal or while loading and unloading fuel from the reactor. Design basis dilution events were re-evaluated with the proposed TS boron concentrations. It was determined that there remains a sufficient amount of time for the operator to recognize the event and stop the dilution. Therefore, this change will not involve a significant reduction in safety margin.

Environmental Considerations

This proposed amendment involves a change to the Technical Specifications. It does not modify any facility components located within the restricted area, as defined in 10 CFR 20. WPSC has determined that the proposed amendment involves no significant hazards considerations and no significant change in the types of any effluents that may be released offsite and that there is no significant increase 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. L. Marchi (WPSC)

To

Document Control Desk (NRC)

Dated

March 2, 2000

Proposed Amendment 170

Revised Technical Specification Pages

TS 3.8-2
TS B3.8-1

5. When there is fuel in the reactor, a minimum boron concentration of 2200 ppm and a shutdown margin of $\geq$5% Δk/k shall be maintained in the Reactor Coolant System during reactor vessel head removal or while loading and unloading fuel from the reactor. The required boron concentration shall be verified by chemical analysis daily.

6. Direct communication between the control room and the operating floor of the containment shall be available whenever changes in core geometry are taking place.

7. Heavy loads, greater than the weight of a fuel assembly, will not be transported over or placed in either spent fuel pool when spent fuel is stored in that pool. Placement of additional fuel storage racks is permitted, however, these racks may not traverse directly above spent fuel stored in the pools.

8. The containment ventilation and purge system, including the capability to initiate automatic containment ventilation isolation, shall be tested and verified to be operable immediately prior to and daily during REFUELING OPERATIONS.

9. a. The spent fuel pool sweep system, including the charcoal adsorbers, shall be operating during fuel handling and when any load is carried over the pool if irradiated fuel in the pool has decayed less than 30 days. If the spent fuel pool sweep system, including the charcoal adsorber, is not operating when required, fuel movement shall not be started (any fuel assembly movement in progress may be completed).

   b. Performance Requirements

      1. The results of the in-place cold DOP and halogenated hydrocarbon tests at design flows on HEPA filters and charcoal adsorber banks shall show $\geq$99% DOP removal and $\geq$99% halogenated hydrocarbon removal.

      2. The results of laboratory carbon sample analysis from spent fuel pool sweep system carbon shall show $\geq$90% radioactive methyl iodide removal at conditions of 66°C and 95% RH.

      3. Fans shall operate within $\pm$10% of design flow when tested.

10. The minimum water level above the vessel flange shall be maintained at 23 feet.

11. A dead-load test shall be successfully performed on both the fuel handling and manipulator cranes before fuel movement begins. The load assumed by the cranes for this test must be equal to or greater than the maximum load to be assumed by the cranes during the REFUELING OPERATIONS. A thorough visual inspection of the cranes shall be made after the dead-load test and prior to fuel handling.

BASIS

The equipment and general procedures to be utilized during REFUELING OPERATIONS are discussed in the USAR. Detailed instructions, the above specified precautions, and the design of the fuel handling equipment incorporating built-in interlocks and safety features, provide assurance that no incident occurs during the REFUELING OPERATIONS that would result in a hazard to public health and safety.[1] Whenever changes are not being made in core geometry, one flux monitor is sufficient. This permits maintenance of the instrumentation. Continuous monitoring of radiation levels (TS 3.8.a.2) and neutron flux provides immediate indication of an unsafe condition. The residual heat removal pump is used to maintain a uniform boron concentration.

A minimum shutdown margin of greater than or equal to 5% $\Delta k/k$ must be maintained in the core. A boron concentration of 2200 ppm, as required by TS 3.8.a.5, is sufficient to ensure an adequate margin of safety. The specification for REFUELING OPERATIONS shutdown margin is based on a dilution during refueling accident.[2] With an initial shutdown margin of 5% $\Delta k/k$, under the postulated accident conditions, it will take longer than 30 minutes for the reactor to go critical. This is ample time for the operator to recognize the audible high count rate signal, and isolate the reactor makeup water system. Periodic checks of refueling water boron concentration ensure that proper shutdown margin is maintained. Specification 3.8.a.6 allows the control room operator to inform the manipulator operator of any impending unsafe condition detected from the main control board indicators during fuel movement.

Interlocks are utilized during REFUELING OPERATIONS to ensure safe handling. Only one assembly at a time can be handled. The fuel handling hoist is dead weight tested prior to use to assure proper crane operation. It will not be possible to lift or carry heavy objects over the spent fuel pool when fuel is stored therein through interlocks and administrative procedures. Placement of additional spent fuel racks will be controlled by detailed procedures to prevent traverse directly above spent fuel.

The one hundred hour decay time following plant shutdown is consistent with the assumption used in the dose calculation for the fuel handling accident. The requirement for the spent fuel pool sweep system, including charcoal adsorbers, to be operating when spent fuel movement is being made provides added assurance that the off-site doses will be within acceptable limits in the event of a fuel handling accident. The spent fuel pool sweep system is designed to sweep the atmosphere above the refueling pool and release to the Auxiliary Building vent during fuel handling operations. Normally, the charcoal adsorbers are bypassed but for purification operation, the bypass dampers are closed routing the air flow through the charcoal adsorbers. If the dampers do not close tightly, bypass

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[1] USAR Section 9.5.2

[2] USAR Section 14.1

ATTACHMENT 3

Letter from M. L. Marchi (WPSC)

To

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March 2, 2000

Proposed Amendment 170

Strike Out Technical Specification Pages

TS 3.8-2
TS B3.8-1

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