Docket Number 50-346
License Number NPF-3
Serial Number 2007
Enclosure
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APPLICATION FOR AMENDMENT

TO

FACILITY OPERATING LICENSE NPF-3

DAVIS-BESSE NUCLEAR POWER STATION

UNIT NUMBER 1

Attached are requested changes to the Davis-Besse Nuclear Power Station, Unit Number 1 Facility Operating License Number NPF-3. Also included is the Safety Assessment and Significant Hazards Consideration.

The proposed changes (submitted under cover letter Serial Number 2007) concern:

Appendix A, Technical Specification 3/4.1.1.2, Reactivity Control Systems-Boron Dilution

Appendix A, Technical Specification Bases 3/4.1.1.2, Boron Dilution

For: D. C. Shelton
Vice President, Nuclear

By: _____
T. J. Myers
Director - Technical Services

Sworn and Subscribed before me this 1st day of May, 1992.

_____
Notary Public, State of Ohio

EVELYN L. DRESS
NOTARY PUBLIC, STATE OF OHIO
My Commission Expires July 28, 1994

The following information is provided to support issuance of the requested changes to Davis-Besse Nuclear Power Station, Unit Number 1 Operating License Number NPF-3, Appendix A, Technical Specification (TS) 3.1.1.2, Reactivity Control Systems-Boron Dilution, and its associated Bases.

A. Time Required to Implement: This change is to be implemented within 90 days after NRC issuance of the License Amendment.

B. Reason for Change (License Amendment Request Number 91-0022, Revision 0):

Certain maintenance activities during plant outages may require that the RCS level be reduced below the level of the reactor vessel flange. For example, in order to install steam generator nozzle dams, the RCS is drained down to approximately 18" above the RCS hot leg centerline. At this level, to prevent vortexing and Decay Heat Removal (DHR) pump cavitation, DHR flow rate is procedurally limited to slightly less than 2800 gpm. In this situation, TS 3.1.1.2 restrictions would apply. That is, with DHR flowrate below 2800 gpm any water added to the RCS would be required to be of higher boron concentration than the RCS.

In accordance with TS 3.9.1, during Mode 6 (refueling), the boron concentration of all filled portions of the Reactor Coolant System (RCS) and the refueling canal must be maintained uniform and sufficient to ensure that the more restrictive of two reactivity conditions is met: keff $\leq$ 0.95, or boron concentration of $\geq$ 1800 ppm.

The proposed change to TS 3.1.1.2 would add a footnote that provides an exception applicable in Mode 6 (Refueling). Specifically, with the flow rate of reactor coolant through the RCS less than 2800 gpm, the footnote would allow the addition of water of lower boron concentration than the RCS provided that the boron concentration of the water to be added is equal to or greater than the boron concentration corresponding to the more restrictive reactivity condition specified in TS 3.9.1. A related change is proposed clarifying Bases 3/4.1.1.2.

C. Safety Assessment and Significant Hazards Consideration: See Attachment

SAFETY ASSESSMENT AND SIGNIFICANT HAZARDS CONSIDERATION

TITLE:

Revision of Technical Specification (TS) 3.1.1.2, Reactivity Control Systems-Boron Dilution, and Associated TS Bases 3/4.1.1.2 to Add an Exception Applicable in Mode 6.

DESCRIPTION:

The purpose of the proposed changes is to modify the Davis-Besse Nuclear Power Station (DBNPS) Operating License NPF-3, Appendix A Technical Specification (TS) 3/4.1.1.2 (Reactivity Control Systems - Boron Dilution) and its associated Bases.

Technical Specification 3.1.1.2 currently states: "The flow rate of reactor coolant through the Reactor Coolant System shall be $\geq$2800 gpm whenever a reduction in Reactor Coolant System boron concentration is being made." As described in TS Bases 3/4.1.1.2, "A minimum flow rate of at least 2800 GPM provides adequate mixing, prevents stratification and ensures that reactivity changes will be gradual through the Reactor Coolant System in the core during boron concentration reductions in the Reactor Coolant System."

The proposed change to TS 3.1.1.2 adds a footnote that provides an exception applicable in Mode 6. Specifically, with the flow rate of reactor coolant through the Reactor Coolant System (RCS) less than 2800 gpm, the footnote allows the addition of water of lower boron concentration than the existing RCS concentration provided that the boron concentration of the water to be added is greater than the boron concentration corresponding to the more restrictive reactivity condition specified in TS 3.9.1, Refueling Operations - Boron Concentration (copy attached). This exception is acceptable since as long as the boron concentration of the water to be added to the RCS is equal to or greater than the refueling boron concentration, the resulting RCS boron concentration is assured to remain greater than the required refueling concentration. Therefore, in this situation, even if incomplete mixing did occur, it would be of no adverse safety consequence.

The proposed change to TS Bases 3/4.1.1.2 adds a discussion of the proposed Mode 6 exception to TS 3.1.1.2.

Certain maintenance activities during refueling may require that the RCS level be reduced below the level of the reactor vessel flange. As the RCS level is reduced, procedural limits are placed on maximum Decay Heat Removal (DHR) flow rate to prevent vortexing and pump cavitation. Since the available DHR pump suction pressure decreases as RCS level is decreased, DHR flow rate is procedurally restricted at reduced RCS levels. Reactor Coolant System temperature is closely monitored to ensure that the flow rate is adequate to remove decay heat. With DHR flow rate procedurally restricted to less than 2800 gpm, the proposed change to TS 3.1.1.2 would result in greater flexibility in the choice of water addition sources when RCS water addition is necessary.

SYSTEMS, COMPONENTS, AND ACTIVITIES AFFECTED:

RCS Boron Dilution in Mode 6 (Refueling)

SAFETY FUNCTIONS OF THE AFFECTED SYSTEMS, COMPONENTS AND ACTIVITIES:

The TS 3.1.1.2 (Reactivity Control Systems-Boron Dilution) Limiting Condition for Operation (LCO) is based on the requirement to maintain a minimum RCS flow rate in order to provide adequate mixing of the RCS. Adequate mixing prevents stratification, and ensures that reactivity changes will be gradual through the RCS in the core during boron concentration reductions. A gradual reactivity change rate ensures that the boron concentration reduction evolution will be within the operator's capability to recognize and control.

Maintaining the boron concentration of all filled portions of the RCS and the refueling canal sufficient to meet the more restrictive of the two reactivity conditions listed in TS 3.9.1 ensures that there will be adequate reactivity control and that the required shutdown margin will be maintained.

EFFECTS ON SAFETY:

As discussed above, with the RCS in a reduced inventory condition, DHR flow rate may be limited to less than 2800 gpm. The desired source of water (e.g., Borated Water Storage Tank or a Clean Waste Receiver Tank) to raise RCS level may be at or below the RCS boron concentration. If the boron concentration of the desired source is lower than the RCS boron concentration, the current TS 3.1.1.2 wording prevents the use of that source in this situation, and requires the use of a source of water of a higher boron concentration (such as the Boric Acid Addition Tank (BAAT)). This source is used until RCS level is raised high enough to support increasing DHR flow rate above 2800 gpm, at which point the lower boron concentration source may be used. The need to perform this change of water addition sources places an extra and unnecessary burden on the operators during the evolution of changing RCS inventory at low RCS levels. The proposed TS change would eliminate the need to perform this source change, reduce the complexity of the evolution, remove an unnecessary burden on the operators, and therefore have a positive impact on plant safety.

As stated in TS Bases 3/4.1.1.2, a flow rate of at least 2800 gpm will circulate an equivalent RCS volume of 12,110 cubic feet in approximately 30 minutes. It should be noted that in Mode 6, there would be no need to reduce DHR flow rate below 2800 gpm, except in a reduced RCS inventory condition. At reduced inventory, the decreased RCS liquid volume significantly compensates for the decreased DHR flow rate, such that there is less of an impact on the time required to circulate an equivalent RCS volume. Viewed strictly from the standpoint of volume turnover rate, this lessens the possibility of incomplete mixing.

Updated Safety Analysis Report (USAR) Section 15.2.4, "Makeup and Purification System Malfunction", describes the results of the analysis of a boron dilution event due to a Makeup and Purification System malfunction. During refueling or maintenance operations when the reactor closure head has been removed, the sources of dilution water to the makeup tank and therefore to the RCS are closed, and the makeup pumps are not operating. Nonetheless, the consequences of accidentally filling the makeup tank with dilution water and starting the makeup pumps has been evaluated. Updated Safety Analysis Report Section 15.2.4.2.3 states: "The entire water volume from the makeup tank could be pumped into the Reactor Coolant System (assuming that only the coolant in the reactor vessel is diluted); the reactor would still be several percent subcritical." The boron dilution event analyzed is independent of RCS flow rate, and therefore the proposed TS changes have no impact on the analysis.

The proposed change to TS 3.1.1.2 would allow the addition of water of lower boron concentration than exists in the RCS, in Mode 6 with the flow rate of reactor coolant through the RCS less than 2800 gpm, provided that the boron concentration of the water to be added is equal to or greater than the more restrictive reactivity condition specified in TS 3.9.1. This exception is acceptable since the RCS boron concentration is assured to remain greater than the required refueling concentration. Therefore, in this situation, even if incomplete mixing did occur, it would be of no adverse consequence to safety.

The proposed change to TS Bases 3/4.1.1.2 adds a discussion of the proposed Mode 6 exception to TS 3.1.1.2. This proposed Bases change has no adverse effect on plant safety.

SIGNIFICANT HAZARDS CONSIDERATION:

The Nuclear Regulatory Commission has provided standards in 10 CFR 50.92(c) for determining whether a significant hazard exists due to a proposed amendment to an Operating License for a facility. A proposed amendment involves no significant hazards if operation of the facility in accordance with the proposed changes would: (1) Not involve a significant increase in the probability or consequences of an accident previously evaluated; (2) Not create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) Not involve a significant reduction in a margin of safety. Toledo Edison has reviewed the proposed change and determined that a significant hazards consideration does not exist because operation of the Davis-Besse Nuclear Power Station, Unit Number 1, in accordance with these changes would:

1a. Not involve a significant increase in the probability of an accident previously evaluated because no accident conditions or assumptions are significantly affected by the proposed changes. The proposed change to Technical Specification (TS) 3.1.1.2 adds an exception, applicable only in Mode 6, that allows water of a lower boron concentration than the Reactor Coolant System (RCS)to be added to the RCS with the flow rate of reactor coolant through

the RCS less than 2800 gpm, provided that the water to be added meets the requirements of TS 3.9.1. TS 3.9.1 requires that in Mode 6, the boron concentration of all filled portions of the RCS and the refueling canal shall be maintained uniform and sufficient to ensure that the more restrictive of two reactivity conditions is met. If the RCS meets these reactivity condition requirements, and water is added to the RCS that also meets the reactivity condition requirements of TS 3.9.1, then the RCS is assured to remain in compliance with the reactivity condition requirements. The possibility that the added water may be of lower boron concentration than the RCS is, therefore, of no adverse consequence to safety. There is no effect on the initial conditions assumed for the boron dilution incident in the accident analysis.

The proposed change to TS Bases 3/4.1.1.2 is considered to be administrative in nature.

1b. Not involve a significant increase in the consequences of an accident previously evaluated because no accident conditions or assumptions are affected by the proposed changes. As discussed in item 1a. above, the proposed addition of the exception to TS 3.1.1.2 will not cause a condition that would result in the RCS not meeting the requirements of TS 3.9.1. The proposed changes do not alter the source term, containment isolation, or allowable releases. The proposed changes, therefore, will not increase the radiological consequences of a previously evaluated accident.

The proposed change to TS Bases 3/4.1.1.2 is considered to be administrative in nature.

2a. Not create the possibility of a new kind of accident from any accident previously evaluated because no new accident initiators or assumptions are introduced by the proposed changes. The proposed change does not alter any accident scenarios. As discussed in item 1a. above, the proposed addition of the exception to TS 3.1.1.2 will not cause a condition that would result in the RCS not meeting the requirements of TS 3.9.1. The proposed change to TS Bases 3/4.1.1.2 is considered to be administrative in nature. None of the proposed changes creates the possibility of a new kind of accident from any accident previously evaluated.

2b. Not create the possibility of a different kind of accident from any accident previously evaluated because no different accident initiators or assumptions are introduced by the proposed changes. The proposed changes do not alter any accident scenarios. As discussed in item 1a. above, the proposed addition of the exception to TS 3.1.1.2 will not cause a condition that would result in the RCS not meeting the requirements of TS 3.9.1. The proposed change to TS Bases 3/4.1.1.2 is considered to be administrative in nature. None of the proposed changes creates the possibility of a different kind of accident from any accident previously evaluated.

3. Not involve a significant reduction in the margin of safety because the proposed change to TS 3.1.1.2, as described above, will not cause a condition that would result in the RCS not meeting the requirements of TS 3.9.1. The margin of safety will be maintained by adhering to the limits specified in that TS. The proposed change to TS Bases 3/4.1.1.2 is considered to be administrative in nature.

CONCLUSION:

On the basis of the above, Toledo Edison has determined that the License Amendment Request does not involve a significant hazards consideration. As this License Amendment Request concerns a proposed change to the Technical Specifications that must be reviewed by the Nuclear Regulatory Commission, this License Amendment Request does not constitute an unreviewed safety question.

ATTACHMENT:

Attached are the proposed marked-up changes to the Operating License.