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 2175) concern:

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

Appendix A, Technical Specification 3/4.9.8.1, Refueling Operations - Decay Heat Removal and Coolant Circulation

Appendix A, Technical Specification 3/4.9.8.2, Refueling Operations - Low Water Level

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

Appendix A, Technical Specification Bases 3/4.9.8, Coolant Circulation

By: L. F. Storz
L. F. Storz
Vice President - Nuclear

Sworn and Subscribed before me this 31st day of January, 1994.

Evelyn L. Dress
Notary Public, State of Ohio

EVELYN L. DRESS
NOTARY PUBLIC, STATE OF OHIO
My Commission Expires July 23, 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) 3/4.1.1.2 (Reactivity Control Systems-Boron Dilution), TS 3/4.9.8.1 (Refueling Operations - Decay Heat Removal and Coolant Circulation), and associated TS 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 93-0002, 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 flowrate 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. An exception, applicable in Mode 6, allows the addition of water of lower boron concentration than the existing RCS boron concentration, provided that the boron concentration of the water to be added meets the requirements specified in TS 3.9.1.

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 3/4.1.1.2 would make the exception applicable in Mode 5 as well as Mode 6, provided that in Mode 5 the boron concentration of the water to be added is equal to or greater than the boron concentration associated with the shutdown margin requirement of TS 3.1.1.1. A related change is proposed for Bases 3/4.1.1.2 to make it consistent with TS 3/4.1.1.2.

The proposed change to TS 3/4.9.8.1, which would add an exception applicable to Mode 6, makes TS 3/4.9.8.1 consistent with the current TS 3/4.1.1.2. Technical Specification 3/4.9.8.2 refers to Surveillance Requirement 4.9.8.1 in its own Surveillance Requirement and, therefore, the proposed change makes TS 3/4.9.8.2 consistent with TS 3/4.1.1.2. A related change to TS Bases 3/4.9.8 would add a corresponding discussion of the Mode 6 exception.

C. Safety Assessment and Significant Hazards Consideration: See Attachment

SAFETY ASSESSMENT AND SIGNIFICANT HAZARDS CONSIDERATION
FOR
LICENSE AMENDMENT REQUEST NUMBER 93-0002

TITLE:

Revision of Technical Specification (TS) 3/4.1.1.2, Reactivity Control Systems-Boron Dilution and Associated TS Bases 3/4.1.1.2 to Add an Exception Applicable in Mode 5, and Revision of TS 3/4.9.8.1, Refueling Operations - Decay Heat Removal and Coolant Circulation, and Associated TS Bases 3/4.9.8 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), TS 3/4.9.8.1 (Refueling Operations - Decay Heat Removal and Coolant Circulation), and associated Bases.

Certain maintenance activities during outages 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) flowrate to prevent vortexing and pump cavitation. Reactor Coolant System temperature is closely monitored to ensure that the flowrate is adequate to remove decay heat.

Technical Specification 3/4.1.1.2 currently states: "The flowrate 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 flowrate 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."

License Amendment 176, issued by the NRC on December 8, 1992, added the asterisked footnote to TS 3/4.1.1.2 which states:

> In MODE 6 the Reactor Coolant System (RCS) boron concentration may be greater than the boron concentration of water available for addition. If the flowrate of reactor coolant through the RCS is less than 2800 gpm, water of lower boron concentration than the existing RCS concentration may be added to 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 Specification 3.9.1.

Since reduced RCS inventory operation could occur in either Mode 5 or Mode 6, adding an exception applicable to Mode 5 as well as Mode 6 would result in greater flexibility in the choice of water addition sources when RCS water addition is necessary. The proposed change to TS 3/4.1.1.2 would revise the footnote to make the exception read:

> In MODE 5 or MODE 6 the Reactor Coolant System (RCS) boron concentration may be greater than the boron concentration of water available for addition. If the flowrate of reactor coolant through the RCS is less than 2800 gpm, water of lower boron concentration than the existing RCS concentration may be added to the RCS provided that in MODE 5 the boron concentration of the water to be added is equal to or greater than the boron concentration associated with the SHUTDOWN MARGIN requirement of Specification 3.1.1.1, or in MODE 6 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 Specification 3.9.1.

The proposed change to TS Bases 3/4.1.1.2 would add a corresponding discussion of the Mode 5 exception, which would read:

> In MODE 5 or MODE 6, the RCS boron concentration is typically somewhat higher than the boron concentration required by Specification 3.1.1.1 (MODE 5) or Specification 3.9.1 (MODE 6), and could be higher than the boron concentration of normal sources of water addition. At reduced inventory conditions in the RCS, in order to reduce the possibility of vortexing, the flowrate through the decay heat system may be procedurally restricted to somewhat less than 2800 gpm. In this situation, if water with a boron concentration equal to or greater than the boron concentration associated with the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 (MODE 5), or the boron concentration corresponding to the more restrictive reactivity condition specified in Specification 3.9.1 (MODE 6), is added to the RCS, the RCS boron concentration is assured to remain above the minimum boron concentration associated with the Specification 3.1.1.1 or Specification 3.9.1 requirement, and a flowrate of less than 2800 gpm is not of concern.

The proposed change to TS 3/4.9.8.1 would add an asterisked footnote to the Limiting Condition for Operation and the Surveillance Requirements which would read:

> Water of a lower boron concentration than the existing RCS concentration may be added to the RCS, with the flowrate 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 boron concentration corresponding to the more restrictive reactivity condition specified in Specification 3.9.1.

This change will make TS 3 4.9.8.1 consistent with the current TS 3/4.1.1.2 Mode 6 exception. Since TS 3/4.9.8.1 applies only in Mode 6, it would not be appropriate to include a Mode 5 exception. Technical Specification 3/4.9.8.2, Refueling Operations - Low Water Level, would also be similarly affected because its own Surveillance Requirement refers to performing the Surveillance Requirement of TS 3/4.9.8.1.

The proposed change to TS Bases 3/4.9.8 would add a corresponding discussion of the Mode 6 exception, which would read:

> In MODE 6, the RCS boron concentration is typically somewhat higher than the boron concentration required by Specification 3.9.1, and could be higher than the boron concentration of normal sources of water addition. The flowrate through the decay heat system may at times be reduced to somewhat less than 2800 gpm. In this situation, if water with a boron concentration equal to or greater than the boron concentration required by Specification 3.9.1 is added to the RCS, the RCS is assured to remain above the Specification 3.9.1 requirement, and a flowrate of less than 2800 gpm i not of concern.

SYSTEMS, COMPONENTS, AND ACTIVITIES AFFECTED:

RCS Boron Dilution in Mode 5 (Cold Shutdown) and Mode 6 (Refueling)

SAFETY FUNCTIONS OF THE AFFECTED SYSTEMS, COMPONENTS AND ACTIVITIES:

The TS 3/4.1.1.2 (Reactivity Control Systems-Boron Dilution) Limiting Condition for Operation (LCO) is based on the requirement to maintain a minimum RCS flowrate 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 a required boron concentration of all filled portions of the RCS and the refueling canal ensures that there will be adequate reactivity control and that the required shutdown margin will be maintained.

EFFECTS ON SAFETY:

Reduced inventory operation can occur in either Mode 5 or Mode 6. As discussed above, with the RCS in a reduced inventory condition, the DHR flowrate may be procedurally limited in order to prevent vortexing and pump cavitation. As a result, the flowrate may be less than 2800 gpm. The desired source of water (e.g., Borated Water Storage Tank or a Clean Waste Receiver Tank) to raise the RCS level may meet the

requirements of TS 3.1.1.1 or TS 3.9.1 but be at or below the RCS boron concentration. The present TS 3/4.1.1.2 provides an exception applicable only in Mode 6. However, in Mode 5, if the boron concentration of the desired source is lower than the RCS boron concentration, the current TS 3/4.1.1.2 wording prevents the use of that source, and requires the use of a source of water of a higher boron concentration (such as the Boric Acid Addition Tank (BAAT)). This high boron concentration source is used until RCS level is raised high enough to support increasing the DHR flowrate above 2800 gpm, at which point the lower boron concentration source may be used. Under TS 3/4.1.1.2 this high boron concentration source must be used even if the desired source's boron concentration meets the Shutdown Margin of $\geq$1% delta k/k required in TS 3.1.1.1 for Mode 5. 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. Provided that shutdown margin requirements of TS 3.1.1.1 are met by the desired source, the proposed TS change would eliminate the need to perform this source change in Mode 5, reduce the complexity of the evolution, remove an unnecessary burden on the operators, and therefore have a positive impact on plant safety.

The proposed change to TS 3/4.1.1.2 would allow the addition of water of lower boron concentration than exists in the RCS in Mode 5 or Mode 6, with the flowrate of reactor coolant through the RCS less than 2800 gpm, provided that in Mode 5 the boron concentration of the water to be added is equal to or greater than the boron concentration associated with the shutdown margin requirement of TS 3.1.1.1, or in Mode 6 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 resulting RCS boron concentration will continue to meet the applicable requirement. In this situation, even if incomplete mixing did occur, it would be of no adverse consequence to safety. There will be adequate reactivity control, and the required shutdown margin will be maintained.

The proposed change to TS Bases 3/4.1.1.2 would add a corresponding discussion of the Mode 5 exception. This proposed change would have no adverse effect on plant safety.

The proposed change to TS 3/4.9.8.1, which would add an exception applicable to Mode 6, makes TS 3/4.9.8.1 consistent with the current TS 3/4.1.1.2. Technical Specification 3/4.9.8.2, which references Surveillance Requirement 4.9.8.1 in its own Surveillance Requirement 4.9.8.2, will then also be consistent with TS 3/4.1.1.2. This proposed change would have no adverse effect on plant safety. The proposed change to TS Bases 3/4.9.8 would add a corresponding discussion of the Mode 6 exception. This proposed change would have 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 initiators, conditions or assumptions are significantly affected by the proposed changes. The proposed change to Technical Specification (TS) 3/4.1.1.2 would revise an exception to make it applicable in Mode 5 as well as Mode 6. The revised exception would allow water of a lower boron concentration than the Reactor Coolant System (RCS) to be added to the RCS, with the flowrate of reactor coolant through the RCS less than 2800 gpm, provided that the water to be added meets the requirements of TS 3.1.1.1 (Mode 5) or TS 3.9.1 (Mode 6). TS 3.1.1.1 requires that in Mode 5, the boron concentration of the RCS be maintained such that the Shutdown Margin shall be $\geq$ 1% $\Delta k/k$. 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 3.1.1.1 or 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, therefore, does not significantly increase the probability of an accident previously evaluted.

The proposed change to TS 3/4.9.8.1 makes TS 3/4.9.8.1 and TS 3/4.9.8.2 consistent with the current TS 3/4.1.1.2, and is considered to be administrative in nature.

The proposed changes to TS Bases 3/4.1.1.2 and TS Bases 3/4.9.8 are 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 revision of the exception to TS 3/4.1.1.2 will not cause a condition that would result in the RCS not meeting the requirements of TS 3.1.1.1 or TS 3.9.1, as applicable. 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. As also discussed in item 1a. above, the proposed changes to TS Bases 3/4.1.1.2, TS 3/4.9.8.1, and TS Bases 3.4.9.8 are 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 changes do not alter any accident scenarios. As discussed in item 1a. above, the proposed revision of the exception to TS 3/4.1.1.2 will not cause a condition that would result in the RCS not meeting the requirements of TS 3.1.1.1 or TS 3.9.1. The proposed changes to TS Bases 3/4.1.1.2, TS 3/4.9.8.1, and TS Bases 3/4.9.8 are considered to be administrative in nature. None of the proposed changes creates the possibility of a new kind of accident.

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 revision of the exception to TS 3/4.1.1.2 will not cause a condition that would result in the RCS not meeting the requirements of TS 3.1.1.1 or TS 3.9.1. The proposed changes to TS Bases 3/4.1.1.2, TS 3/4.9.8.1, and TS Bases 3/4.9.8 are 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 3/4.1.1.2, as described above, will not cause a condition that would result in the RCS not meeting the requirements of TS 3.1.1.1 or TS 3.9.1. The margin of safety will be maintained by adhering to the limits specified in these TSs. The proposed changes to TS Bases 3/4.1.1.2, TS 3/4.9.8.1 and TS Bases 3/4.9.8 are 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.