

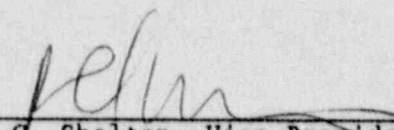
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APPLICATION FOR AMENDMENT
TO
FACILITY OPERATING LICENSE NUMBER NPF-3
FOR
DAVIS-BESSE NUCLEAR POWER STATION
UNIT NUMBER 1

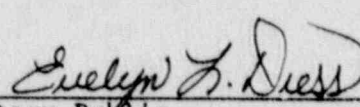
Attached are requested changes to the Davis-Besse Nuclear Power Station, Unit Number 1 Facility Operating License Number NPF-3. The proposed changes (submitted under cover letter Serial Number 1750) concern:

Technical Specification 4.1.3.1.1
Technical Specification 4.1.3.2.1
Technical Specification 3.1.3.3
Technical Specification 4.1.3.3
Technical Specification 3.1.3.3, Action b.
Technical Specification Bases Section 3/4.1.3

By:


D. C. Shelton, Vice President - Nuclear

Sworn and subscribed before me this 1st day of February, 1990


Notary Public

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

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The following information is provided to support issuance of the requested changes to the Davis-Besse Nuclear Power Station, Unit Number 1 Operating License Number NPF-3, Appendix A, Technical Specifications:

- A. Time Required to Implement: This change will be implemented within 45 days of approval.
- B. Reason for Change (LARs 89-0011 and 89-0039): 1) Revise Technical Specification (TS) 3/4.1.3.3 acceptance criteria for Absolute Position Indicator Channels and Relative Position Indicator Channels to reflect uncertainties used in Babcock & Wilcox safety analyses, 2) Correct TS 3.1.3.3, Action b. requirements by interchanging the terms "absolute position indicator channel" and "relative position indicator channel" within the Action, 3) Correct TS 4.1.3.1.1, 4.1.3.2.1 and 4.1.3.3 terminology from "Asymmetric Rod Fault Circuitry" to "asymmetric rod monitor".
- C. Technical Description: See attached Technical Description (Attachment 1)
- D. Significant Hazards Consideration: See attached Significant Hazards Consideration (Attachment 2)
- E. Marked-up Technical Specification pages: See attached (Attachment 3)

TECHNICAL DESCRIPTION

DESCRIPTION OF PROPOSED TECHNICAL SPECIFICATION CHANGE

This license amendment request (LAR) proposes revising the surveillance requirements (SRs) of Technical Specifications (TSs) 3/4.1.3.1, Group Height-Safety and Regulating Rod Groups, and 3/4.1.3.2, Group Height-Axial Power Shaping Rod Group, and the limiting condition for operation (LCO), the SR and Action b. of Technical Specification (TS) 3/4.1.3.3, Position Indicator Channels, and associated Bases 3/4.1.3. The SRs for TS 4.1.3.1.1, 4.1.3.2.1, and 4.1.3.3 should be revised to reflect the terminology "asymmetric rod monitor" versus "Asymmetric Rod Fault Circuitry" per the Updated Safety Analysis Report. The present LCO and the SR acceptance criteria of TS 3/4.1.3.3 are larger than the values given in both the Babcock and Wilcox (B&W) Standard Technical Specifications (STS) and in the design basis analyses for core performance. Also, the words "absolute" and "relative" in Action b. of TS 3.1.3.3 are interchanged compared to the STS. The proposed amendment provides for administrative correction to TS 4.1.3.1.1, 4.1.3.2.1, and 4.1.3.3, corrects the LCO and SR acceptance criteria TS 3/4.1.3.3, and reverses the wording in TS 3.1.3.3, Action b.

SYSTEM AFFECTED

Control Rod Position Indicator Channels (no hardware changes)

SAFETY FUNCTION OF THE SYSTEMS AFFECTED

The function of the position indicators is to provide the means for determining control rod assembly (CRA) positions to ensure compliance with the control rod alignment and insertion limits. The position indicators do not have a safety function.

EFFECTS ON SAFETY/PROPOSED CHANGE

Technical Specification LCO 3.1.3.1 currently states that the "...absolute position indicator channels and relative position indicator channels shall be OPERABLE and capable of determining the control rod positions within $\pm 6.5\%$ ". Surveillance Requirement 4.1.3.3 states that OPERABILITY shall be determined by "...verifying that the relative position indicator channels and the absolute position indicator channels agree within 6.5% ..." In both instances, the STS has a value of "(2.0%)". (Parentheses signify the value should be plant specific.) Technical Specification 3/4.1.3.3 has never been amended, so the 6.5% values have been in existence since the original license was issued. When no documentation could be located to support the 6.5% values, B&W was tasked with performing an analysis to determine what the values should be. The details of that analysis are presented in B&W Document 32-1176260-01 "API/RPI In-Service Calibration".

The following is a brief description of the analysis. B&W has always applied a 1.5% uncertainty to the rod group average position as part of the maneuvering analysis for reload, commonly referred to as the rod index

uncertainty (i. e., the rod index curves are conservatively adjusted by this amount). This uncertainty accounts for the deviation of the indicated group average position from the true average position. The two position indicator (PI) systems used to indicate position are the Absolute Position Indication (API) and the Relative Position Indication (RPI). An API channel consists of two staggered strings of magnetic reed switches. The API, mounted on the outside of the Control Rod Drive Mechanism Motor tube, is installed and set up when a control rod drive is installed and any adjustments are done at that time. The API switches are normally not recalibrated. The RPI is a small, pulse-stepping motor driven from the power supply for the rod drive motor coupled to a potentiometer to generate a voltage signal equivalent to position. The RPI can be recalibrated. During normal plant operations, the RPI is reset as necessary to match the API, therefore, the API is being used as the "known" position of the CRA. This "known" position has an inaccuracy associated with the API instrument string. It is required that the instrument string is recalibrated each refueling to maintain the desired accuracy. In addition, the RPI, which is calibrated to the API, has an inherent string inaccuracy. Part of the RPI inaccuracy is the amount by which the RPI reading can deviate from the API reading before recalibration is required. The maximum amount of this deviation is established by the SR. The LCO, then, reflects both the hardware inaccuracy and the allowed deviation between the API and RPI. When used in conjunction with the SR allowed deviation, it preserves the 1.5% rod group index uncertainty which B&W applies. In other words, the API will always meet the LCO, and its inaccuracy is only a small fraction of the total uncertainty, unless two or more consecutive reed switches fail (as discussed below). The RPI uncertainty, including drift and calibration errors, must be assured to always meet the LCO by limiting the amount the RPI can deviate from API.

A specific surveillance requirement of the reed switches for operability is not required due to the following. If one or more of the reed switches fail closed, a large API indication of asymmetry occurs. Two failed open reed switches in series also result in a large indication of asymmetry. Failed open reed switches not in series (up to the worst case of one entire string of switches, i. e. every other switch in the circuit) are bounded by the analysis. Therefore, all reed switch failure combinations are either bounded by the analysis or will be indicated by API system asymmetry indications.

From the above, it is necessary to quantify the deviation (drift and calibration) to be allowed for the RPI, including inherent inaccuracies. Exceeding this allowed value would indicate the need to realign the RPI system to some "known" condition, as indicated by the API system, in order to preserve the 1.5% assumed rod group inaccuracy when either system is used. The analysis to define this allowed deviation was accomplished via Monte Carlo simulation methods. There are no design changes to the API or the RPI as a consequence of this amendment request. Therefore, the errors associated with the hardware are unchanged. Monte Carlo techniques were applied due to the random nature of the errors. In summary, each trial consisted of determining the position that would be indicated by each position indicating system for one CRA. The difference between the two systems' indicated positions was then saved as a trial result. The final result, then, was the difference at which recalibration of the RPI to the API should be made because it would be unlikely that a deviation of such magnitude would occur due to normally

expected errors. The result of the analysis was that for a rod group position uncertainty of 1.5%, and amount of deviation allowed for a single CRA, i.e. the SR, is 3.46%. Therefore, the proposed SR is being changed accordingly.

Currently, the LCO provides a tolerance for the PI in terms of a single CRA. The single CRA uncertainty, however, is used only to determine the group average uncertainty which B&W applies. Since the group average uncertainty is more meaningful and is implemented in the NRC approved B&W methodology, the proposed amendment uses the 1.5% group average uncertainty for the wording of the LCO.

In summary, the LCO preserves the 1.5% rod group index uncertainty which B&W applies. The SR preserves the individual CRA uncertainty, which preserves the LCO. If the SR is not met, either the RPI needs recalibration (reset to the API) or the PI hardware (API or RPI) is not functioning correctly. If the hardware is not functioning, the appropriate Action is entered. (An API hardware malfunction would be identified by an asymmetric rod condition and the associated TS 3.1.3.1 Action would be performed.)

Technical Specification Bases 3/4.1.3 is also being changed to reflect the above discussion.

Another proposed change to TS 3.1.3.3 is to Action b. The wording in the B&W STS is that "with more than one pulse stepping position indicator channel inoperable...provided all of the reed switch position indicator channels are OPERABLE." Davis-Besse uses the terminology RPI and API, respectively, for these position indicator channels. As mentioned above, the API consists of reed switches and the RPI uses pulse-stepping motors. When the B&W STS were originally reworded for Davis-Besse, the wording was reversed. The proposed wording in Action b. corrects the wording to be consistent with the B&W STS. On an interim basis, the administrative error in the existing TS has been administratively corrected by a Davis-Besse Technical Specification Interpretation in accordance with discussion with the NRC Senior Project Manager for Davis-Besse on June 29, 1989.

The terminology "Asymmetric Rod Fault Circuitry" cited in SRs 4.1.3.1.1, 4.1.3.2.1 and 4.1.3.3 is incorrect and should be revised to "asymmetric rod monitor". This revised terminology is consistent with Updated Safety Analysis Report Section 7.7.1.3.2 and, therefore, the change is considered administrative only.

UNREVIEWED SAFETY QUESTION EVALUATION

The proposed action would not increase the probability of occurrence of an accident previously evaluated in the USAR because there are no hardware changes or design modifications which would affect the probability of an accident. (10CFR50.59(a)(2)(i))

The proposed action would not increase the consequences of an accident previously evaluated in the USAR because the change is to correct the existing Technical Specification and will ensure compliance with analytical assumptions to keep consequences within existing analyses. (10CFR50.59(a)(2)(i))

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The proposed action would not increase the probability of occurrence of a malfunction of equipment important to safety because there are no hardware or design modifications which would affect the probability of a malfunction.
(10CFR50.59(a)(2)(i))

The proposed action would not increase the consequences of a malfunction of equipment important to safety because the change is to correct the existing Technical Specification and will ensure compliance with analytical assumptions to keep consequences within existing analyses. (10CFR50.59(a)(2)(i))

The proposed action would not create a possibility for an accident of a different type than any evaluated previously in the USAR because there have been no hardware changes or design modifications which could affect accident initiators. (10CFR50.59(a)(2)(ii))

The proposed action would not create a possibility for a malfunction of equipment of a different type than any evaluated previously in the USAR because there have been no hardware changes or design modification to any equipment. This is a Technical Specification correction only.
(10CFR50.59(a)(2)(iii))

The proposed action would not reduce the margin of safety as defined in the basis for the Technical Specifications. This Technical Specification is being changed to ensure the margin of safety originally intended is maintained.
(10CFR50.59(2)(iii))

CONCLUSION

Pursuant to the above, these changes to the Technical Specifications do not involve an unreviewed safety question.

SIGNIFICANT HAZARDS CONSIDERATION

Description of Proposed Technical Specification Changes

The purpose of this Significant Hazards Consideration is to review proposed changes to the Davis-Besse Nuclear Power Station (DBNPS), Unit Number 1 Operating License, Appendix A, Technical Specifications. The proposed changes involve Technical Specifications (TS) 3/4.1.3.1, Group Height-Safety Regulating Rod Groups, 3/4.1.3.2, Group Height-Axial Power Shaping Rod Group, and 3/4.1.3.3, Position Indicator Channels, and TS Bases Section 3/4.1.3, Movable Control Assemblies.

The DBNPS TS 3.1.3.3 and 4.1.3.3 presently incorporate an absolute position indicator (API) channel/relative position indicator (RPI) channel acceptance criteria of 6.5%. However, Babcock & Wilcox (B&W) uncertainty analyses indicate that the TS 3.1.3.3 acceptance criteria should be 1.5% uncertainty for rod group average position. Further, the deviation between API to RPI measurements specified in TS 4.1.3.3, to preserve the TS 3.1.3.3 rod group average uncertainty, should be 3.46%.

Technical Specification 3.1.3.3, Action b. is being revised to interchange the terms "absolute position indicator channel" and "relative position indicator channel" to administratively correct this Action consistent with the B&W Standard Technical Specifications (NUREG-0103, Revision 4).

Additionally, TS 4.1.3.1.1, 4.1.3.2.1, and 4.1.3.3 terminology for the "Asymmetric Rod Fault Circuitry" is being revised to "asymmetric rod monitor" to be consistent with the Updated Safety Analysis Report Section 7.7.1.3.2.

The Technical Description (Attachment 1) provides additional discussion of the proposed changes.

Significant Hazards Consideration

The Nuclear Regulatory Commission has provided standards in 10CFR50.92(c) for determining whether a significant hazard exists. A proposed amendment to an Operating License for a facility involves no significant hazards if operation of the facility in accordance with the proposed changes would not: 1) Involve a significant 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; or 3) Involve a significant reduction in a margin of safety.

The proposed Technical Specification changes do not involve a significant hazards consideration because the operation of the Davis-Besse Nuclear Power Station, Unit Number 1, in accordance with these changes would:

1. Not involve a significant increase in the probability or consequences of an accident previously evaluated because the changes do not involve hardware changes or design modifications which would affect the

probability of an accident, but correct the Technical Specifications to ensure compliance with analytical assumptions to preserve the consequences within existing analyses (10CFR50.92(c)(1)).

2. Not create the possibility of a new or different kind of accident from any accident previously evaluated because no hardware change or design modification to existing equipment is being made. The changes correct the Technical Specifications only (10CFR50.92(c)(2)).
3. Not involve a significant reduction in a margin of safety because these Technical Specification changes correct the Technical Specifications to ensure the margin of safety originally intended is maintained (10CFR50.92(c)(3)).

Conclusion

Based on the discussion above, it is concluded that the proposed changes do not involve a significant hazards consideration.