APPLICATION FOR AMENDMENT

TO

FACILITY OPERATING LICENSE NO. NPF-3

FOR

DAVIS-BESSE NUCLEAR POWER STATION

UNIT NO. 1

Enclosed are forty-three (43) copies of the requested changes to the Davis-Besse Nuclear Power Station Unit No. 1 Facility Operating License No. NPF-3, together with the Safety Evaluation for the requested change.

The proposed changes include Figure 2.1-2, 2.2-1, Table 3.2-1 and Bases.

By /s/ R. P. Crouse
Vice President, Nuclear

Sworn and subscribed before me this 13th day of February, 1985.

/s/ Laurie A. Hinkle, nee (Brudzinski)
Notary Public, State of Ohio
My Commission Expires May 16, 1986

S E A L

Docket No. 50-346
License No. NPF-3
Serial No. 1125
February 13, 1985

Attachment

I. Changes to Davis-Besse Nuclear Power Station Unit 1, Appendix A Technical Specifications Figures 2.1-2, 2.2-1, Table 3.2-1 and Bases.

A. Time required to lmplement. This change is to be effective upon NRC approval.

B. Reason for Change (Facility Change Request 85-0021). Revision to the minimum RCS flow requirement to take credit for decrease in the core bypass flow as a result of using Lump Burnable Poison rods in Cycle 5 design.

C. Safety Evaluation
(See Attached)

D. Significant Hazard Consideration
(See Attached)

SAFETY EVALUATION

This FCR proposes a change to the DB-1 Tech. Spec. minimum RCS flow requirement to take credit for the use of the Lumped Burnable Poison (LBP) rods and the corresponding decrease in core by-pass flow in the Cycle 5 reload core design.

The safety function of the Tech. Spec. minimum reactor coolant system (RCS) flow requirement is to ensure adequate cooling of the reactor core such that the minimum required DNBR is maintained. To justify the proposed change it is necessary to demonstrate that this decrease in system flow does not result in a decreased core cooling capability. The coolant flow available for core cooling represents the difference between the total RCS flow and the core by-pass flow. Core by-pass comprises the RCS flow within the reactor vessel that does not flow around fuel rods. Major by-pass paths that exist in the reactor vessel include:

1. Empty guide tubes in fuel assemblies.
2. Baffle plates.
3. Gaps around the hot leg nozzle in upper core internals.

A change in the total cross-sectional area of all by-pass paths will directly affect the system flow and the split between core flow and by-pass flow. Assuming all other variables remain constant, a decrease in by-pass area results in a slight decrease in system flow, a decrease in by-pass flow, and an increase in core flow.

Cycle 5 utilizes Lumped Burnable Poisons (LBP's) in the 64 new fuel assemblies to accommodate the IN-OUT-IN fuel shuffle scheme. Since the presence of the LBP rod assemblies reduces the core by-pass flow path, the by-pass flow for Cycle 5 is therefore less than that for earlier cycles (except cycle IA where LPB and orifice rods were used). B&W stated in their letter BWT-85-2316 (Attachment A) that the Cycle 5 Reload thermal hydraulic analysis assumed no LBP insertion when determining by-pass flow. They also stated that insertion of 64 LBP's would decrease by-pass flow from the 10.7% used in the Cycle 5 Reload Report to 8.1%. This decrease in by-pass flow would result in a larger core coolant flow than was assumed in the Cycle 5 Reload analysis. Therefore, a reduction in the Tech. Spec. minimum RCS flow requirement can be justified.

The new minimum RCS flow must ensure that the core coolant flow associated with it and an 8.1% by-pass flow is greater than or equal to the core coolant flow associated with the present minimum flow and 10.7% by-pass flow. The minimum DNBR requirement remains unchanged. B&W in letter BWT-85-2317 (Attachment B) has specified these new flow rates for 4 RC pump and 3 RC pump operation. These reduced minimum RCS flow rates can be used without invalidating the results of the Cycle 5 Reload Report.

The proposed change affects Table 3.2-1 of Tech. Spec. Section 3.2.5. The flow requirement for 4 pumps operation (396,880 gpm) represents 110% of design flow plus 2.5% uncertainty. The revised flow will be 389,664 gpm which corresponds to 108% of design flow and includes 2.55% uncertainty. The 3 pump case is also changed from 297,340 gpm to 291,080 gpm. To

maintain consistency, other Tech. Spec. Sheets (2-3, 2-7, B2-1, B2-8) are also changed since they have quoted flow rates that correspond to 110% of the design flow. The flow changes on these pages do not include the 2.5% uncertainty used in Table 3.2-1.

On Tech. Spec. Sheet 2-7, an editorial change is made to clarify that the 3 pump operation represents an "approximately" 25% flow reduction. On Tech. Spec. Sheet B2-8, there is a typo error. The 89.3% for 3 pump operation should have been 89.1% (to be consistent with Tech. Spec. Sheet 2-3).

The proposed Tech. Spec. changes to not degrade the safety function of the Technical Specifications for Davis-Besse nor do they represent an unreviewed safety question.

Babcock & Wilcox
a McDermott company

Nuclear Power Division
3315 Old Forest Road
P.O. Box 10935
Lynchburg, VA 24506-0935
(804) 385-2000

January 23, 1985
BWT-85-2317

Dr. Frank Y. Chen - Mail Stop 710
The Toledo Edison Company
Edison Plaza
300 Madison Avenue
Toledo, OH 43652

Subject: Davis-Besse Nuclear Power Station Unit 1
System Design Flow - Revised

Dear Dr. Chen:

As a follow-up to my letter of January 22 (BWT-85-2316), attached is a comparison between current and proposed technical specification system design flow values for 4-pump and 3-pump operation.

The following technical specification pages will require change:

Page 2-3 (Required System Flow)

Page 2-7 (Required System Flow, 3-Pump)

Page B 2-1 (Required System Flow, 4-Pump; Percent of Design Flow)

Page B 2-8 (Required System Flow)

Page 3/4 2-14 (Required System Flow plus Measurement Error)

Very truly yours,

D.M. Rainey
Project Manager
Nuclear Fuel Services

DMR/ds
Attachment

Attachment

Minimum Acceptable Reactor Coolant Flow (GPM)

	4-Pump Operation		3-Pump Operation	
	Current TS	Proposed TS	Current TS	Proposed TS
Required System Flow	387,200	380,160	290,100	283,980
Required System Flow Plus 2.5% Measurement Error	396,880	389,664	297,340	291,080
Percent of Design Flow Rate	110%	108%	110%	108%

Babcock & Wilcox

a McDermott company

Nuclear Power Division

3315 Old Forest Road
P.O. Box 10935
Lynchburg, VA 24506-0935
(804) 385-2000

January 22, 1985
BWT-85-2316

Dr. Frank Y. Chen - Mail Stop 710
The Toledo Edison Company
Edison Plaza
300 Madison Avenue
Toledo, OH 43652

Subject: Davis-Besse Nuclear Power Station Unit No. 1
Revised System Design Flow

Dear Dr. Chen:

Forwarded herewith is the following document:

Trans. 86-1155464-00 "Revised System Design Flow," one (1) page, dated January 17, 1985.

Very truly yours,

D. M. Rainey
Project Manager
Nuclear Fuel Services

DMR/drs

BAW-2021D-2 (1-83)

CALCULATION DATA/TRANSMITTAL SHEET

660-095E
D81-CY5

DOCUMENT IDENTIFIER

CALC. 32 - _____ - _____ C.C. 385

TRANS. 86 - 1155464 - 00 REF. PG(s) 1

TYPE: _____ _____ _____ _____ _____ X

TITLE Revised System Design Flow

PREPARED BY E. R. Miller REVIEWED BY R. L. Herne

TITLE Tech Spec III DATE 1/17/85 TITLE Engineer III DATE 1-17-85

PURPOSE:

To document lower system design flow calculated for Davis Besse 1, Cycle 5.

References: 1) 32-1155463-00, "Revised System Design Flow," 660-095E, E. R. Miller, January 15, 1985.
2) 32-1146814-01, "Fuel Thermal Analysis - Cycle 5 Revised," 660-095E, E. R. Miller, April 30, 1984.

SUMMARY OF RESULTS (INCLUDE DOC. ID'S OF PREVIOUS TRANSMITTALS & SOURCE CALCULATIONAL PACKAGES FOR THIS TRANSMITTAL).

The Reference 1 calculation package supports lowering the Davis Besse 1 minimum system design flow from 110% to 108% of 88000 gpm/pump. The accident and technical specification analysis results documented in Reference 2 as applicable for cycle 5 operation used a conservative leakage of 10.7% based on no LBP insertion. Reference 1 showed that the use of the reduced leakage allowed by the insertion of 64 LBPs for cycle 5 (8.1%) with the 108% system design flow will result in a higher predicted core flow than was considered in Reference 2. Thus, the reduction of system design flow to 108% can be made without invalidating the results previously documented for Davis Besse 1, Cycle 5.

The minimum flow rate now equals 380160 gpm (108% of 88000 gpm/pump). The maximum flow remains unchanged (417120 gpm).

A change in flow measurement error was not considered in the Reference 1 calculations.

DISTRIBUTION

See DRN.

SIGNIFICANT HAZARD CONSIDERATION

This amendment request is to revise the minimum Reactor Coolant System (RCS) Flow requirements to take credit for decrease in the core bypass flow resulting from the use of Lump Burnable Poison (LBP) rods in Cycle 5 design. This amendment request does not represent a Significant Hazard.

The Cycle 5 core utilizes Lumped Burnable Poison in the 64 new fuel assemblies to accommodate the IN-OUT-IN fuel shuffle scheme. Since the presence of the LBP rod assemblies reduces the core by-pass flow path, the by-pass flow for Cycle 5 is therefore less than that for earlier cycles (except cycle IA where LPB and orifice rods were used). The Cycle 5 Reload thermal hydraulic analysis assumed no LBP insertion when determining by-pass flow. The analysis stated that insertion of 64 LBP's would decrease by-pass flow from the 10.7% used in the Cycle 5 Reload Report to 8.1%. This decrease in by-pass flow would result in a larger core coolant flow than was assumed in the Cycle 5 Reload analysis. Therefore, a reduction in the Technical Specification minimum RCS flow requirement can be justified.

The RCS flow requirement is to ensure adequate cooling of the reactor core such that the minimum required DNBR is maintained. To justify the proposed change it is necessary to demonstrate that this decrease in system flow does not result in a decreased core cooling capability. The coolant flow available for core cooling represents the difference between the total RCS flow and the core by-pass flow. Core by-pass comprises the RCS flow within the reactor vessel that does not flow around fuel rods. Major by-pass paths that exist in the reactor vessel include:

1. Empty guide tubes in fuel assemblies.
2. Baffle plates.
3. Gaps around the hot leg nozzle in upper core internals.

A change in the fuel cross-sectional area of all by-pass paths will directly affect the system flow and the split between core flow and by-pass flow. Assuming all other variables remain constant, a decrease in by-pass area results in a slight decrease in system flow, a decrease in by-pass flow, and an increase in core flow.

The new minimum RCS flow must ensure that the core coolant flow associated with it and an 8.1% by-pass flow is greater than or equal to the core coolant flow associated with the present minimum flow and 10.7% by-pass flow. The minimum DNBR requirement remains unchanged. These reduced minimum RCS flow rates can be used without invalidating the results of the Cycle 5 Reload Report.

The flow requirement for 4 pumps operation (396,880 gpm) represents 100% of design flow plus 2.5% uncertainty. The revised flow will be 389,664 gpm which corresponds to 108% of design flow and includes 2.55% uncertainty. The 3 pump case is also changed from 297,340 gpm to 291,080 gpm.

The granting of this request would not:

1) Involve a significant increase in the probability or consequences of an accident previously evaluated (10CFR50.92.(C)(1).

   All accidents previously evaluated within the reload report or other evaluations remain unchanged. The minimum flow requirement will ensure adequate DNBR is maintained as assumed in Davis-Besse accident analysis. Therefore, the change does not involve a significant increase in the probability of an accident previously evaluated.

2) Create the possibility of a new or different kind of an accident previously evaluated (10CFR50.92(C)(2).

   The flow change will not affect minimum required DNBR for all previously evaluated accidents. Therefore, this amendment would not create the possibility of new or different kind of accident.

3) Involve a significant reduction in a margin of safety, 10CFR50.92(C)(3).

   The amendment request changes the minimum flow requirement but maintains the DNBR limit and all other accident evaluations assumptions and limits. Therefore, with all evaluation assumptions and limits unchanged, there is no reduction in the margin of safety.

Based on the attached safety evaluation and the above Significant Hazard Consideration, this amendment request does not contain a Significant Hazard.