

Mr. L. W. Myers
Senior Vice President
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
Post Office Box 4
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION, UNIT NO. 1 - ISSUANCE OF
AMENDMENT RE: CHANGE IN TECHNICAL SPECIFICATION BORON
CONCENTRATION LIMITS (TAC NO. MB1575)

Dear Mr. Myers:

The Commission has issued the enclosed Amendment No. _____ to Facility Operating License No. DPR-66 for the Beaver Valley Power Station, Unit No. 1 (BVPS-1). This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated March 28, 2001, as supplemented by letters dated May 18, June 15, and July 18, 2001.

The amendment approves changes to the BVPS-1 TS boron concentration limits for the refueling water storage tank, accumulators, boron injection tank (BIT), and the reactor coolant system/refueling canal during Mode 6. In conjunction with the reduction in the maximum boron concentration in the BIT, the temperature controls on the BIT are eliminated.

A copy of our related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

Lawrence J. Burkhart, Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-334

Enclosures: 1. Amendment No. _____ to DPR-66
2. Safety Evaluation

cc w/encls: See next page

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Accession No. ML012390312

*No significant changes made to SE

**See previous concurrence

OFFICE	PDI-1/PM	PDI-1/LA	SRXB/SC	OGC	PDI-1/(A)SC
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OFFICIAL RECORD COPY

Beaver Valley Power Station, Units 1 and 2

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PENNSYLVANIA POWER COMPANY

OHIO EDISON COMPANY

FIRSTENERGY NUCLEAR OPERATING COMPANY

DOCKET NO. 50-334

BEAVER VALLEY POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.
License No. DPR-66

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by FirstEnergy Nuclear Operating Company, et al. (the licensee) dated March 28, 2001, as supplemented by letters dated May 18, June 15, and July 18, 2001, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-66 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. _____, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Patrick D. Milano, Acting Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance:

ATTACHMENT TO LICENSE AMENDMENT NO. _____

FACILITY OPERATING LICENSE NO. DPR-66

DOCKET NO. 50-334

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

<u>Remove</u>	<u>Insert</u>
3/4 1-15	3/4 1-15
3/4 1-16	3/4 1-16
3/4 5-1	3/4 5-1
3/4 5-7	3/4 5-7
3/4 9-1	3/4 9-1
B 3/4 1-3	B 3/4 1-3
B 3/4 5-2	B 3/4 5-2
B 3/4 9-1	B 3/4 9-1

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. _____ TO FACILITY OPERATING LICENSE NO. DPR-66
PENNSYLVANIA POWER COMPANY
OHIO EDISON COMPANY
FIRSTENERGY NUCLEAR OPERATING COMPANY
BEAVER VALLEY POWER STATION, UNIT NO. 1
DOCKET NO. 50-334

1.0 INTRODUCTION

By letter dated March 28, 2001 (Agencywide Documents Access and Management System [ADAMS] Accession No. ML010950314), as supplemented by letters dated May 18 (ADAMS Accession No. ML011440053), June 15 (ADAMS Accession No. ML011770185), and July 18 (ADAMS Accession No. ML012070178), 2001, the FirstEnergy Nuclear Operating Company (FENOC; the licensee) submitted a request for changes to the Beaver Valley Power Station, Unit No. 1 (BVPS-1) Technical Specifications (TSs).

The requested changes would revise the BVPS-1 TS boron concentration limits for the refueling water storage tank (RWST), accumulators, boron injection tank (BIT), and the reactor coolant system/refueling canal during Mode 6. In conjunction with the reduction in the maximum boron concentration in the BIT, the temperature controls on the BIT would be eliminated.

These changes in the boron concentration limits in the RWST and accumulators are needed to accommodate the higher reactor core reactivity associated with the operation of the core at higher plant capacity factors. The higher reactivity of the core requires higher boron concentrations in the RWST, accumulators and BIT to offset the increased reactivity at the beginning-of-life cycle and to remain within the limits for the design-basis accidents. These changes are expected to apply beginning with the next core reload design.

The minimum boron concentration specified for the RWST in limiting condition for operation (LCO) 3.1.2.7.b.2 would be revised from "2000 [parts-per-million] (ppm)" to "2400 ppm."

The range of boron concentration specified for the RWST in LCO 3.1.2.8.b.2 would be revised from between "2000 and 2100 ppm" to between "2400 and 2600 ppm".

The range of boron concentration specified for the accumulators in LCO 3.5.1.c would be revised from between "1900 and 2100 ppm" to between "2300 and 2600 ppm."

The range of boron concentration specified for the BIT in LCO 3.5.4.1.1.b would be revised from between "2,000 and 7,700 ppm" to between "2400 and 2600 ppm."

The temperature controls for the BIT specified in the LCO, Action statement, and surveillance requirement in TS 3/4.5.4 would be eliminated.

The minimum boron concentration specified in LCO 3.9.1.b would be revised from "2000 ppm" to " ≥ 2400 ppm."

The minimum boron concentration specified in the Action statement for LCO 3.9.1 would be revised from "2000 ppm" to "2400 ppm."

The May 18, June 15, and July 18, 2001, letters provided clarifying information that did not change the initial proposed no significant hazards consideration determination or expand the scope of the initial *Federal Register* notice.

2.0 EVALUATION

The requested increment to the minimum boron concentration TS limits in the RWST, accumulators, and BIT is 400 ppm. This value is based on scoping calculations by the licensee of expected boron concentration requirements due to increases in the energy load of BVPS-1. The increased energy load will be met through an increase in the core reactivity by increasing the enrichment of the fuel. Scoping analyses of post-loss-of-coolant-accident (LOCA) boron concentration requirements, performed by the licensee, indicated that at least an additional 100 ppm of boron is required in the RWST to ensure sufficient shutdown margin. The largest increase in the calculated reactor core boron concentration requirement was 270 ppm, which correlates with a slightly higher increase in the minimum RWST/accumulator/ BIT boron concentrations. Based on these analyses, a conservative value of 400 ppm was chosen which addresses the immediate and near future core design requirements. Increases much greater than 400 ppm were judged to adversely affect the cost associated with maintaining boric acid inventories and on the operation of boron recovery and reactor coolant system (RCS) cleanup systems, as well as potential post-accident consequences.

The current upper limit of the boron concentration in the BIT is above the upper limit of the RWST. This is not required with respect to applicable safety analyses. Consequently, the upper limit of the boron concentration in the BIT is being reduced from 7700 ppm to the proposed 2600 ppm to be consistent with that of the RWST. The proposed allowable boron concentration in the BIT of 2600 ppm does not approach the solubility limit at the lowest operating temperatures of the BIT. This, thereby, removes the need to maintain the associated temperature controls and their associated surveillance requirements on the BIT.

In principle, increasing the boron concentration limit is conservative for most safety criteria. However, an increase in the boron concentration limits, for a fixed volume, affects the pH of the water. This may adversely affect the post-LOCA radio-iodine removal and retention, and increase the potential for stress corrosion cracking of stainless steel components in containment. The licensee's analyses indicate that the proposed change in the limits of the boron concentrations will exceed neither the minimum pH limit to ensure adequate post-LOCA radio-iodine removal and retention, nor the maximum pH limit which is set to minimize the

potential for stress corrosion cracking of stainless steel components and minimize the release of hydrogen from the corrosion of aluminum.

In addition to considerations of change in the pH of water, an increase in the boron concentration in the RWST, accumulators and BIT reduces the solubility at low temperatures. Since water with boron concentrations of less than 4000 ppm remains soluble at temperatures above 32° F, the existing requirements for freeze protection are satisfied. This eliminates the need for associated temperature controls on the BIT.

Given the boron concentration increases, the switchover from cold leg to hot leg injection, following a postulated LOCA, must occur sooner to avoid boron precipitation in the reactor vessel. The licensee has performed analyses supporting a reduced hot leg switchover time of 8.0 hours based on maximum boron concentrations and borated water volumes. The licensee stated in its March 28, 2001, letter that the reduced cold-to-hot leg switchover time of 8.0 hours will be incorporated into the BVPS-1 Emergency Operating Procedures upon approval and implementation of this amendment.

The change in the boron concentration limits is in conjunction with an increase in the fuel enrichment; and the latter must be taken into account in all scoping analyses, in particular, with regard to a rod cluster control assembly ejection accident. The licensee has determined that the parameters and values used in the analysis of the rod cluster control assembly ejection accident, and listed in the BVPS-1 Updated Final Safety Analysis Report (USFAR) in Table 14.2-3, remain bounding and valid with fuel up to 5.0 weight percent enrichment and with the changes requested in this license amendment. This accident and other non-LOCA accidents will be explicitly considered in reload evaluations.

The NRC staff finds that the proposed increases in the minimum boron concentrations and ranges of acceptable boron concentrations are conservative. The increases in boron concentrations do not adversely affect the solubility of boron in the RCS, the potential for stress corrosion cracking of stainless steel components, the release of hydrogen from the corrosion of aluminum, or the validity of the evaluation of a postulated rod cluster control assembly design-basis accident. Furthermore, the reduced cold-to-hot leg switchover time will be implemented in BVPS-1. Therefore, the NRC staff finds the proposed changes to the boron concentration limits for the RWST, accumulators, BIT, and the RCS/Refueling Canal during Mode 6 acceptable. Due to the continued solubility of boron in water at the proposed concentrations, the NRC staff also finds the elimination of the temperature controls on the BIT acceptable. Under these changes, there is reasonable assurance that the facility will operate within the acceptance criteria of the UFSAR and the health and safety of the public will not be endangered. The proposed changes are, therefore, acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendment. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes

surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts and no significant change in the types of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (66 FR 38763). Accordingly, the 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 the issuance of the amendment.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: Yuri Orechwa

Date: