

March 12, 2001

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: REDUCTION IN TECHNICAL SPECIFICATION LIMIT FOR REACTOR
COOLANT SYSTEM (RCS) SPECIFIC ACTIVITY (TAC NO. MA9627)

Dear Mr. Myers:

The Commission has issued the enclosed Amendment No. 263 to Facility Operating License No. DPR-66 for the Beaver Valley Power Station (BVPS), Unit No. 1. You requested changes to the Updated Final Safety Analysis Report (UFSAR) and Technical Specifications (TSs) pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Sections 50.59(c) and 50.90. Proposed changes to the UFSAR include revisions to input parameter values and assumptions used in the BVPS, Unit 1, Main Steam Line Break design-basis accident safety analysis and changes to the TSs include the reduction of the RCS specific activity limit. The reduction in the RCS specific activity limit is in accordance with the methodology described in the Nuclear Regulatory Commission's Generic Letter 95-05, "Voltage-Based Repair Criteria for Westinghouse Steam Generator Tubes by Outside Diameter Stress Corrosion Cracking." Appropriate changes to the TS Bases are also included. This amendment is issued in response to your application dated July 21, 2000, as supplemented by letters dated December 1, and December 13, 2000, and January 29, 2001.

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

Sincerely,

/RA/

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. 236 to DPR-66
2. Safety Evaluation

cc w/encls: See next page

Beaver Valley Power Station, Units 1 and 2

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March 12, 2001

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RE: REDUCTION IN TECHNICAL SPECIFICATION LIMIT FOR REACTOR
COOLANT SYSTEM (RCS) SPECIFIC ACTIVITY (TAC NO. MA9627)

Dear Mr. Myers:

The Commission has issued the enclosed Amendment No. 236 to Facility Operating License No. DPR-66 for the Beaver Valley Power Station (BVPS), Unit No. 1. You requested changes to the Updated Final Safety Analysis Report (UFSAR) and Technical Specifications (TSs) pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Sections 50.59(c) and 50.90. Proposed changes to the UFSAR include revisions to input parameter values and assumptions used in the BVPS, Unit 1, Main Steam Line Break design-basis accident safety analysis and changes to the TSs include the reduction of the RCS specific activity limit. The reduction in the RCS specific activity limit is in accordance with the methodology described in the Nuclear Regulatory Commission's Generic Letter 95-05, "Voltage-Based Repair Criteria for Westinghouse Steam Generator Tubes by Outside Diameter Stress Corrosion Cracking." Appropriate changes to the TS Bases are also included. This amendment is issued in response to your application dated July 21, 2000, as supplemented by letters dated December 1, and December 13, 2000, and January 29, 2001.

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

Sincerely,

/RA/

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. 236 to DPR-66
2. Safety Evaluation

cc w/encls: See next page

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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. 236
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 July 21, 2000, as supplemented by letters dated December 1, and December 13, 2000, and January 29, 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. 236 , 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

/RA/

Marsha Gamberoni, 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: March 12, 2001

ATTACHMENT TO LICENSE AMENDMENT NO. 236

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.

Remove

XIX
3/4 4-18
3/4 4-20
3/4 4-21
B 3/4 4-4
B3/4 4-5

Insert

XIX
3/4 4-18
3/4 4-20
3/4 4-21
B 3/4 4-4
B 3/4 4-5

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 236 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 July 21, 2000, as supplemented by letters dated December 1, and December 13, 2000, and January 29, 2001, the FirstEnergy Nuclear Operating Company, et al. (FENOC, the licensee), submitted a request for changes to the Beaver Valley Power Station (BVPS), Unit 1, Updated Final Safety Analysis Report (UFSAR). Proposed changes to the UFSAR include revisions to the Main Steam Line Break (MSLB) accident dose consequence analysis. Specific changes include revisions to the following analysis inputs: (1) the reactor thermal power level, (2) reactor coolant system (RCS) and steam generator (S/G) fluid content, (3) accident-induced primary-to-secondary leak rate, and (4) post-accident steam release from S/Gs. Changes were requested to reflect more accurate or more conservative input parameter values and assumptions based on plant design or operation.

In support of changing the accident-induced primary-to-secondary leak rate, the licensee included a proposed technical specification (TS) change that would decrease the RCS specific activity limit. This proposed TS change utilizes the methodology described in Generic Letter (GL) 95-05, "Voltage-Based Repair Criteria for Westinghouse Steam Generator Tubes by Outside Diameter Stress Corrosion Cracking," also commonly referred to as the use of alternate repair criteria (ARC).

For the upcoming BVPS, Unit 1, Cycle 14, the licensee calculated the projected End of Core accident-induced steam generator (primary-to-secondary) leak rate per GL 95-05. This calculation resulted in an increased maximum primary-to-secondary leak rate, that, when combined with the current RCS specific activity limit, gave unacceptable radiological consequences for the design-basis MSLB accident. To allow for increased maximum primary-to-secondary leak rate, the licensee proposes to change the TS 3/4.4.8 RCS specific activity limit from the current value of 0.35 $\mu\text{Ci}/\text{gram}$ Dose Equivalent Iodine 131 (DEI-131) to a value of 0.20 $\mu\text{Ci}/\text{gram}$ DEI-131. The requested changes in TS 3/4.4.8 affect the Limiting Condition for Operation 3.4.8.a, Actions, Table 4.4-12, and Figure 3.4-1. Changes to the TS Bases and to the Figure Index page are requested for consistency.

The December 1, 2000, letter was submitted as a supplement for a separate amendment request dated May 12, 2000 (FENOC License Amendment Request No. 280), but the information is applicable to this amendment request as it provided additional information regarding the justification for changes to several input parameters including power level, RCS and S/G fluid content, primary-to-secondary leak rates, and post-accident steam release from S/Gs. The December 13, 2000, letter provided supplemental information regarding the licensee's no significant hazards evaluation. The information from the original submittal and the December 13, 2000, letter, was used as a basis for the Nuclear Regulatory Commission (NRC) staff's proposal to determine that the amendment request involves a no significant hazards consideration determination as published in the *Federal Register* on February 7, 2001 (66 FR 9382). Although not specifically used as a basis for the staff's initial proposed no significant hazards consideration determination, the December 1, 2000, letter provided supplemental information applicable to this amendment request but did not change the initial proposed no significant hazards consideration determination or expand the amendment request beyond the scope of the original notice. The January 29, 2001, letter clarified that the dose calculations regarding a BVPS, Unit 1, postulated MSLB accident, submitted in the July 21, 2000, letter (FENOC License Amendment Request No. 284), superseded the calculations forwarded in a May 12, 2000, amendment request (FENOC License Amendment Request No. 280). The January 29, 2001, letter did not change the initial proposed no significant hazards consideration determination or expand the amendment request beyond the scope of the original notice.

2.0 EVALUATION

The changes made to the BVPS, Unit 1, MSLB accident dose consequence analysis, as documented in the licensee's submittals, reflect corrected or conservative analysis input parameter values or input assumptions based on plant design and operation. Various plant parameters used in the licensee's reevaluation of the BVPS, Unit 1, MSLB accident dose analysis deviate from the values previously applied in the existing dose analysis. The licensee provided its justifications for the changes and the NRC staff's evaluation is discussed below. The analysis methodology remains the same as had been previously reviewed and approved by the staff.

2.1 Change to Assumed Power Level

The current value of 2766 Mega-watts thermal (MWt) has been revised to 2705 MWt for BVPS, Unit 1, for the MSLB accident dose consequence analysis. This change was made to reflect the current licensed maximum reactor power level in the safety analysis. BVPS, Unit 1, is limited to 2652 MWt by the facility operating license and as defined in the TS definition for RATED THERMAL POWER. The safety analysis is performed assuming 102 percent of full-power operation or 2705 MWt. The NRC staff finds that the change to the power level input parameter accurately reflects the actual licensed maximum power level and includes an appropriate margin to account for uncertainties and is, therefore, acceptable.

2.2 Change to Assumed RCS and S/G Fluid Content

In the BVPS, Unit 1, UFSAR, the values of RCS fluid content have been reduced for the MSLB analysis. The licensee states in its letter dated December 1, 2000, that the revised values are derived from WCAP-13707-1 for the 30 percent (S/G) tube plugging limits and they are

selected as the most conservative inputs for dose calculations. These revised RCS fluid content values do not include the pressurizer vapor space. For the BVPS, Unit 1, MSLB accident, these values correspond to 0 percent power operation which gives the most limiting radiological consequences. For the MSLB accident (in which a coincident iodine spike is part of the source term), mixing in the pressurizer liquid volume is not assumed for conservatism, and a lower RCS volume is used. The revised values of the S/G liquid content and S/G steam content are lower than the current values for the MSLB accident analysis. These revised values were developed by Westinghouse based on sensitivity studies to assure these parameters will result in conservative dose calculations for various accident scenarios. The NRC staff finds that the revised RCS and S/G fluid content parameters are conservative with respect to the resulting dose consequences and are, therefore, acceptable.

2.3 Change to Assumed Accident-Induced Primary-to-Secondary Leak Rate

Radiation dose calculations performed during initial licensing for BVPS, Unit 1, in accordance with Standard Review Plan criteria, assumed a coincident iodine spike as part of the source term. However, the licensee discovered that the initial analysis used for a coincident iodine spike significantly underestimated the potential spike magnitude and resulting calculated radiation dose (see Licensee Event Report 1-99-002, Accession No. 9903110156, available from the NRC Public Document Room). The licensee determined that calculation input parameters need to maximize the removal of RCS activity during steady state plant operation preceding a postulated design-basis accident to also maximize the resultant calculated coincident iodine spike dose because this maximizes the allowable pre-existing reactor core leakage rate within TS limits (removal of RCS activity would be maximized by (1) maximizing the operational value of letdown flow rate, (2) maximizing the nominal value of the letdown demineralizer efficiency, (3) crediting RCS leakage as an RCS activity removal mechanism, and (4) consistently applying the RCS volume value which serves to bound the potential maximum dose). When maximum removal of RCS activity is accounted for in the MSLB accident dose consequence analysis, the limit for post-MSLB S/G tube leak rate (accident-induced primary-to-secondary leak rate) must be reduced, for a given RCS specific activity, as a conservative measure to ensure the ARC remain valid and bounding. For the BVPS, Unit 1, MSLB accident dose consequence analysis, this would result in a reduction in the accident-induced primary-to-secondary leak rate from 8 gpm to approximately 3 gpm for an RCS specific activity limit of 0.35 $\mu\text{Ci}/\text{gram}$ DEI-131.

However, the licensee revised the MSLB accident dose analysis to incorporate the reduced RCS specific activity limit of 0.20 $\mu\text{Ci}/\text{gram}$ DEI-131 and increased the accident-induced primary-to-secondary leak rate to 5.5 gpm. The licensee's analysis generally follows guidance given in GL 95-05 and NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," Section 15.1.5, for a pressurized-water reactor MSLB dose analysis.

GL 95-05 states that any reduction of the RCS specific activity limit to less than 0.35 $\mu\text{Ci}/\text{gram}$ DEI-131 requires an evaluation of release rate data as described in *Nuclear Technology*, Vol. 94, p. 361 (1991), J. P. Adams and C. L. Atwood, "The Iodine Spike Release Rate During a Steam Generator Tube Rupture." The licensee provided this release rate information and evaluation in the submittal. The evaluation shows that BVPS, Unit 1, RCS DEI-131 data supports lowering the TS RCS specific activity limit to 0.20 $\mu\text{Ci}/\text{gram}$ without compromising the

SRP assumption of an iodine appearance rate spiking factor of 500, occurring coincident with the MSLB event. The NRC staff reviewed the information provided and determined that the licensee's assumptions and methodology are acceptable and support the proposed TS changes.

The results of the licensee's MSLB dose analysis are reported in the attached table. The MSLB control room thyroid dose will increase from the current 29 rem to 30 rem to allow for the maximum projected End of Core accident-induced steam generator (primary-to-secondary) leak rate. No increases in the control room whole body dose or any offsite doses resulted from the revised analysis. The radiological consequences meet the dose limits given in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 100, for offsite doses. The calculated control room doses meet the dose limits given in 10 CFR Part 50, Appendix A, General Design Criterion 19 (GDC-19). The NRC staff finds that the change in the accident-induced primary-to-secondary leak rate from 8 gpm to 5.5 gpm is acceptable and conservative. In addition, the NRC staff finds that the reduction of the TS 3/4.4.8 RCS specific activity limit from .35 $\mu\text{Ci}/\text{gram}$ to .20 $\mu\text{Ci}/\text{gram}$ is acceptable with regard to the radiological consequences of design-basis accidents.

This TS change includes the reduction of the RCS specific activity limit from .35 $\mu\text{Ci}/\text{gram}$ to .20 $\mu\text{Ci}/\text{gram}$ in (1) LCO 3.4.8.a, (2) Action a for MODES 1, 2, and 3, (3) Action a for MODES 1, 2, 3, 4 and 5, (4) Table 4.4-12, Minimum Frequency "a" for Type of Measurement and Analysis "4," and (5) lowering the "Acceptable Operation" line in Figure 3.4-1 to reflect the reduced RCS specific activity limit of .20 $\mu\text{Ci}/\text{gram}$. Page XIX containing the Figure Index for the TS is also revised to reflect the reduced RCS specific activity value for Figure 3.4-1. TS Bases changes are included for consistency.

2.4 Change to Assumed Post-Accident Steam Release From S/Gs

During an MSLB accident, the current values of steam release from the affected S/G are 150,000 pounds-mass (lbm) in the first 30 minutes and 1,300 lbm between 30 minutes to 8 hours after the initiation of the event at BVPS, Unit 1. These values have been revised to 170,050 lbm and 1397 lbm, respectively. These changes reflect the increased S/G liquid content and the primary-to-secondary leak rate as discussed previously. The revised values are higher and more conservative than the current values for the BVPS, Unit 1, MSLB analysis. Consequently, the NRC staff finds the revised post-accident steam release values acceptable.

2.5 Evaluation Conclusion

The licensee requested changes to input parameter values and assumptions for the BVPS, Unit 1, MSLB dose analysis that are conservative or more accurately reflect plant design and operation. The control room dose results remain within the GDC-19 dose guidelines of 5 rem whole body or its equivalent to any part of the body. No increases in offsite doses resulted from the revisions and the offsite doses remain within the 10 CFR Part 100 dose guideline values of 25 rem whole body and 300 rem thyroid. Consequently, the NRC staff finds the revised BVPS, Unit 1, MSLB accident dose consequence analysis, as documented in the licensee's submittals, to be acceptable.

In addition, requested changes to the accident-induced primary-to-secondary leak rate necessitate a corresponding TS change for reducing the RCS specific activity limit from .35 $\mu\text{Ci}/\text{gram}$ to .20 $\mu\text{Ci}/\text{gram}$ as described in Section 2.3 above. The NRC staff finds these TS changes acceptable due to the appropriate changes made to the BVPS, Unit 1, MSLB accident dose consequence analysis and the licensee's conformance with the regulatory guidance contained in GL 95-05 and NUREG-0800.

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 9382). 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.

Attachment: Table, Results of Licensee Dose Analysis, MSLB

Principal Contributor: Michelle Hart

Date: March 12, 2001

**Results of Licensee Dose Analysis
Main Steam Line Break
RCS Specific Activity 0.2 $\mu\text{Ci/gm}$ DEI-131**

Control Room Doses (rem)				
	Co-Incident Spike	<i>GDC-19 criterion</i>	Pre-Incident Spike	<i>GDC-19 criterion</i>
thyroid	30	30	14	30
whole body	<0.2	5	<0.2	5
Exclusion Area Boundary Doses, 0-2 hours (rem)				
	Co-Incident Spike	<i>SRP criterion</i>	Pre-Incident Spike	<i>SRP criterion</i>
thyroid	25	30	15	300
whole body	<0.2	2.5	<0.2	25
Low Population Zone Doses, 0-30 days (rem)				
	Co-Incident Spike	<i>SRP criterion</i>	Pre-Incident Spike	<i>SRP criterion</i>
thyroid	15	30	2.8	300
whole body	<0.2	2.5	<0.2	25