

December 4, 2000

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

SUBJECT: BEAVER VALLEY POWER STATION UNIT NO. 1 - ISSUANCE OF
AMENDMENT RE: UPDATED FINAL SAFETY ANALYSIS REPORT, REMOVAL
OF LISTING OF STAINLESS STEEL AS MATERIAL FOR THE REACTOR
COOLANT SYSTEM AND REACTOR COOLANT PRESSURE BOUNDARY
COMPONENT FASTENERS (TAC NO. MA8300)

Dear Mr. Myers:

The Commission has issued the enclosed Amendment No. 235 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 Updated Final Safety Analysis Report (UFSAR) in response to your application dated February 21, 2000, which submitted License Amendment Request No. 279.

The changes to the UFSAR approved by this amendment will remove the listing of stainless steel as the material for reactor coolant system and reactor coolant pressure boundary component fasteners. These UFSAR changes were determined to involve an unreviewed safety question pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.59 because of the differences in the body-to-bonnet fastener materials identified on UFSAR Tables 1.8-1 and 1.8-2 as compared to the materials that were actually installed during original construction. The as-installed carbon steel fasteners are susceptible to boric acid degradation, while the stainless steel material identified in the UFSAR Tables 1.8-1 and 1.8-2 is highly resistant to boric acid corrosion. Thus, a new failure mechanism due to boric acid corrosion would be possible. However, the boric acid corrosion program developed and applied over the past 15 years by BVPS-1 will adequately monitor the joints for potential degradation and provide reasonable assurance that boric acid corrosion will not lead to degradation within boric acid systems that will be adverse to safety.

This amendment authorizes changes to the UFSAR, and requires that the changes be submitted with the next update of the UFSAR pursuant to 10 CFR 50.71(e). A copy of our 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. 235 to DPR-66
2. Safety Evaluation

cc w/encls: See next page

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PUBLIC	MO'Brien	ACRS	SNathan
PDI-1 Reading	LBurkhart	MOprendek, RGN-I	KManoly
EAdensam	OGC	GGeorgiev	KWichman
MGamberoni	GHill (4)	MHartzman	WBeckner

ACCESSION NUMBER: ML003752715 *SE input provided 8/4/00. No major changes were made

OFFICE	PDI-1\PM	PDI-1\PM	PDILA	EMEB	EMCB	OGC	PDI-1\SC
NAME	SNathan	LBurkhart	MO'Brien w/changes	SE dated*	SE dated *	C. Marco	MGamberoni
DATE	10/30/00	11/2/00	10/31/00	8-7-00	8/4/00	11/14/00	11/30/00

Official Record Copy

Beaver Valley Power Station, Units 1 and 2

Mary O'Reilly, Attorney
FirstEnergy Nuclear Operating Company
FirstEnergy Corporation
76 South Main Street
Akron, OH 44308

FirstEnergy Nuclear Operating Company
Licensing Section
Thomas S. Cosgrove, Manager (2 Copies)
Beaver Valley Power Station
Post Office Box, BV-A
Shippingport, PA 15077

Commissioner Roy M. Smith
West Virginia Department of Labor
Building 3, Room 319
Capitol Complex
Charleston, WV 25305

Director, Utilities Department
Public Utilities Commission
180 East Broad Street
Columbus, OH 43266-0573

Director, Pennsylvania Emergency
Management Agency
Post Office Box 3321
Harrisburg, PA 17105-3321

Ohio EPA-DERR
ATTN: Zack A. Clayton
Post Office Box 1049
Columbus, OH 43266-0149

Dr. Judith Johnsrud
National Energy Committee
Sierra Club
433 Orlando Avenue
State College, PA 16803

FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
Mr. J. J. Maracek
Post Office Box 4, BV-A
Shippingport, PA 15077

FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
ATTN: Kevin L. Ostrowski,
Plant General Manager (BV-SOSB-7)
Post Office Box 4
Shippingport, PA 15077

Bureau of Radiation Protection
Pennsylvania Department of
Environmental Protection
ATTN: Larry Ryan
Post Office Box 2063
Harrisburg, PA 17120

Mayor of the Borough of
Shippingport
Post Office Box 3
Shippingport, PA 15077

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Resident Inspector
U.S. Nuclear Regulatory Commission
Post Office Box 298
Shippingport, PA 15077

FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
ATTN: M. P. Pearson, Director Plant
Services (BV-NCD-3)
Post Office Box 4
Shippingport, PA 15077

Mr. J. A. Hultz, Manager
Projects & Support Services
FirstEnergy
76 South Main Street
Akron, OH 44308

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. 235
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 February 21, 2000, 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, changes to the Updated Final Safety Analysis Report (UFSAR) to remove the listing of stainless steel as the material for reactor coolant system and reactor coolant pressure boundary component fasteners, as set forth in the application by the licensee dated February 21, 2000, are authorized. The licensee shall submit the changes authorized by this amendment with the next update of the UFSAR in accordance with 10 CFR 50.71(e).
3. This license amendment is effective as of its date of issuance and is to be implemented as specified in (2) above.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Marsha Gamberoni, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Date of Issuance: December 4, 2000

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 235 TO FACILITY OPERATING

LICENSE NO. DPR-66

PENNSYLVANIA POWER COMPANY

OHIO EDISON COMPANY

FIRSTENERGY NUCLEAR OPERATING COMPANY

BEAVER VALLEY POWER STATION, UNIT 1

DOCKET NO. 50-334

1.0 INTRODUCTION

By letter dated February 21, 2000, FirstEnergy Nuclear Operating Company (FENOC, the licensee) submitted a request for changes to the Beaver Valley Power Station, Unit No. 1 (BVPS-1), Updated Final Safety Analysis Report (UFSAR). The requested changes to the UFSAR involve removal of stainless steel fasteners from Table 1.8-1, Reactor Coolant System (RCS) Major Components/Part Materials and Table 1.8-2, Reactor Coolant Pressure Boundary (RCPB) Materials Class I and II Auxiliary Components. The reason for the proposed changes is to correct errors in the listing of materials in Tables 1.8-1 and 1.8-2. Specifically, BVPS-1 UFSAR identifies American Society of Mechanical Engineers (ASME) SA 453 Grade 660 and SA 194 Grade B6 as the installed materials in Tables 1.8-1 and 1.8-2, when in fact the materials of construction for body-to-bonnet fasteners for nearly all flange joints at BVPS-1 are low alloy steel ASME SA 540, Grade B, Class 23 or 24. Ferritic steels have design stress values different from those for austenitic steels, and are also susceptible to corrosive damage from borated water leakage. The licensee identified that these changes involve an unreviewed safety question (USQ), pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.59, because of the differences in the body-to-bonnet fastener materials identified on UFSAR Tables 1.8-1 and 1.8-2 as compared to the materials that were actually installed during original construction. The as-installed carbon steel fasteners are susceptible to boric acid degradation, while the stainless steel material identified in the UFSAR Tables 1.8-1 and 1.8-2 is highly resistant to boric acid corrosion. Thus, a new failure mechanism due to boric acid corrosion would be possible. The licensee also stated in its request that the error in the identification of the materials of construction for the body-to-bonnet fasteners pre-dates Revision 0 of the BVPS-1 UFSAR (January 1982).

2.0 EVALUATION

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the information submitted by the licensee in its letter dated February 21, 2000. The licensee determined that the use of

carbon steel fasteners in lieu of the SA 453 Grade 660 fasteners identified in the UFSAR introduced the potential failure mechanism of boric acid corrosion. This determination was validated during the evaluation of corrosion damage that has occurred on bolting for valves MOV-RC-591 and MOV-CH-310 which indicated a potential exists for corrosion damage from unchecked borated water leakage to carbon steel fasteners. These degraded conditions were identified and repaired prior to becoming an operational or structural concern through the application of the BVPS-1 Boric Acid Corrosion Program. The proposed changes in the BVPS-1 UFSAR to remove the listing of stainless steel fasteners for RCS and RCPB components does not involve a significant reduction in the margin of safety since the current technical specification requirements for the structural integrity of the reactor coolant system remain unchanged and the Boric Acid Corrosion Program, with its inspections, provides adequate assurance that abnormal leakage is identified and corrective actions are taken prior to significant boric acid corrosion. As discussed in the licensee's response to Generic Letter (GL) 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components In PWR Plants," which was reviewed by the NRC staff and determined to be acceptable, the BVPS-1 Boric Acid Corrosion Program includes provisions in plant procedures for visual inspection of RCS components. These inspections, which are intended to identify leakage and the effects of boric acid corrosion, are performed during heat up after the refueling outage. The inspection results are evaluated, appropriate action is taken to clean up boric acid deposits, and leakage problems are resolved. The NRC staff has reviewed the BVPS-1 Boric Acid Corrosion Program and found the program to be acceptable to fulfill the requirements of GL 88-05. GL 88-05 requires the licensees to have a program that will systematically measure to ensure that boric acid corrosion does not lead to degradation of the assurance that the RCPB will have an extremely low probability of abnormal leakage, rapidly propagating failure or gross rupture. On that basis, the NRC staff finds that the change to carbon steel fasteners would not affect the design-basis accidents described in the UFSAR. The boric acid wastage concern is mitigated by the Boric Acid Corrosion Program.

ASME, Section III, Appendix I, Table I-1.3, lists design stress intensity values for bolting materials for Class 1 components. A comparison of the values for both bolting materials indicates that the design values for ferritic bolts are greater than those for austenitic bolts. FENOC also stated that, to meet the requirements of the design codes for valves (ANSI or ASME, Section III), the number of fasteners installed is in excess of the number of fasteners required to maintain the structural integrity of the pressure boundary. This means that for the same size bolts, design load capacity of carbon steel bolts is higher than austenitic bolts. Therefore, the NRC staff finds that the structural design margin of safety of the valves with the installed ferritic fasteners is at least the same as the design margin of safety based on the austenitic fasteners provided no degradation due to boric acid corrosion occurs.

3.0 SUMMARY

Pursuant to 10 CFR 50.59, the licensee has addressed the USQ resulting from the use of ferritic fasteners and their potential degradation due to boric acid corrosion. The licensee has demonstrated that the use of ferritic fasteners does not increase the likelihood of a significant reduction in the margin of safety, and the design-basis accidents described in the UFSAR are not affected, provided boric acid corrosion is effectively monitored and controlled. The licensee has stated that such a program has been in effect at BVPS-1 since 1988. Therefore, the NRC staff finds the proposed UFSAR changes to be acceptable.

4.0 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.

5.0 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. 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 (65 FR 37426). 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.

6.0 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 Contributors: G. Georgiev
M. Hartzman
S. Nathan

Date: December 4, 2000