

January 31, 2000

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

SUBJECT: BEAVER VALLEY 1 AND 2 - EVALUATION OF REQUEST FOR RELIEF TO USE  
CODE CASE N-533-1 (TAC NOS. MA6854 AND MA6855)

Dear Mr. Myers:

By letter dated October 11, 1999, Duquesne Light Company (DLC) submitted a request for relief (BV3-N-533-1, Rev. 0) from, and proposed an alternative to, certain requirements of Subsection IWA of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code for the Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and BVPS-2). Specifically, this relief request sought Nuclear Regulatory Commission (NRC) approval for use of Code Case N-533-1 on Class 1, 2, and 3 systems.

On the date of the October 11, 1999, letter, DLC was the licensed operator for BVPS-1 and BVPS-2. On December 3, 1999, DLC's ownership interests in both BVPS-1 and BVPS-2 were transferred to the Pennsylvania Power Company, and DLC's operating authority for BVPS-1 and BVPS-2 was transferred to FirstEnergy Nuclear Operating Company (FENOC). By letter dated December 13, 1999, FENOC requested that the NRC continue to review and act upon all requests before the Commission which had been submitted by DLC.

Accordingly, the NRC staff has completed its review of this relief request and the proposed alternative. As described in the enclosed safety evaluation, the NRC staff has authorized the use of Code Case N-533-1 following a system pressure test with a minimum 4-hour hold time pursuant to 10 CFR 50.55a(a)(3)(i) for the remainder of the third 10-year inservice inspection interval at BVPS-1 and for the remainder of the second 10-year inservice inspection interval at BVPS-2 or until such time that Code Case N-533-1 is published in a future revision of Regulatory Guide 1.147.

L. W. Myers

-2-

If you have any questions regarding this evaluation, please contact the Beaver Valley Project Manager, Daniel Collins at (301) 415-1427.

Sincerely,

*/RA* by Timothy Colburn Acting For/

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

Docket Nos. 50-334 and 50-412

Enclosure: Safety Evaluation

cc w/encl: See next page

If you have any questions regarding this evaluation, please contact the Beaver Valley Project Manager, Daniel Collins at (301) 415-1427.

Sincerely,

*/RA* by Timothy Colburn Acting For/

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

Docket Nos. 50-334 and 50-412

Enclosure: Safety Evaluation

cc w/encl: See next page

**DISTRIBUTION:**

File Center	EAdensam	ACRS	MTschiltz
PUBLIC	MO'Brien	JRogge, RGN-I	GHill (4)
PDI-1 Reading	DCollins	AKeim	
MGamberoni	OGC	ESullivan	

DOCUMENT NAME: C:\RRa6854.wpd

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	PDI-1/PM	<input type="checkbox"/> E	PDI-2/LA	<input type="checkbox"/>	EMCB	<input type="checkbox"/>	OGC	<input type="checkbox"/>	PDI-1/ASC	<input type="checkbox"/>
NAME	DCollins		MO'Brien		SE dtd		RHoefling		TColburn	
DATE	1/19/00		1/19/00		01/07/00		1/24/00		1/28/00	

Official Record Copy

Beaver Valley Power Station, Units 1 and 2

Jay E. Silberg, Esquire  
Shaw, Pittman, Potts & Trowbridge  
2300 N Street, NW.  
Washington, DC 20037

First Energy Nuclear Operating Company  
Licensing Section  
Mark S. Ackerman, Manager (2 Copies)  
Beaver Valley Power Station  
PO Box 4, 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

First Energy Nuclear Operating Company  
Beaver Valley Power Station  
J. J. Maracek  
P. O. Box 4, BV-A  
Shippingport, PA 15077

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

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

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

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REGARDING A REQUEST FOR RELIEF TO USE CODE CASE N-533-1

PENNSYLVANIA POWER COMPANY

OHIO EDISON COMPANY

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

THE TOLEDO EDISON COMPANY

FIRSTENERGY NUCLEAR OPERATING COMPANY

BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2

DOCKET NOS. 50-334 AND 50-412

1.0 INTRODUCTION

By letter dated October 11, 1999, Duquesne Light Company (DLC) submitted a request for approval for an alternative to the requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (B&PV Code) for inservice inspection (ISI). The information provided by DLC in support of the request for relief from Code requirements has been evaluated and the basis for disposition is documented below.

On the date of the October 11, 1999, letter, DLC was the licensed operator for the Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and BVPS-2). On December 3, 1999, DLC's ownership interests in both BVPS-1 and BVPS-2 were transferred to the Pennsylvania Power Company, and DLC's operating authority for BVPS-1 and BVPS-2 was transferred to the FirstEnergy Nuclear Operating Company (FENOC). By letter dated December 13, 1999, FENOC requested that the Nuclear Regulatory Commission (NRC) continue to review and act upon all requests before the Commission which had been submitted by DLC.

2.0 BACKGROUND

ISI of the ASME Code Class 1, 2 and 3 components shall be performed in accordance with Section XI of the ASME Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(6)(g)(i). Pursuant to 10 CFR 50.55a(a)(3), alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2 and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for ISI of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. For BVPS-1 the applicable edition of Section XI of the ASME Code for the third 10-year ISI interval is the 1989 Edition. For BVPS-2 the applicable edition of Section XI of the ASME Code for the second 10-year ISI interval is the 1989 edition.

### 3.0 EVALUATION

3.1 Relief Request BV3-N-533-1, Rev. 0: Class 1, 2, and 3 pressure retaining bolted connections in systems borated for the purpose of controlling reactivity.

3.1.1 Applicable ASME Section XI Code (1989 Edition) requirement from which relief is requested:

IWA-5242(a) requires, "For systems borated for the purpose of controlling reactivity, insulation shall be removed from pressure retaining bolted connections for visual examination VT-2."

3.1.2 Licensee's Basis for Requesting Relief (as stated):

"The ASME Section XI Subcommittee has approved and published Code Case N-533-1, 'Alternative Requirements for VT-2 Visual Examination of Class 1, 2, and 3 Insulated Pressure Retaining Bolted Connections.' This code case allows removal of insulation and examination of the connection without the connection being pressurized. Additionally, the code case requires a system pressure test and VT-2 examination without removal of the insulations. Regulatory Guide 1.147 (revision 12, dated May, 1999), does not include Code Case N-533-1. DLC has been authorized to implement the alternative examination specified in Code Case N-533 for Class 1 bolted connections only (Relief BV3-IWA-1, SER, dated October 8, 1997). The current request adds Class 2 and 3 connections in accordance with the latest revision of Code Case N-533-1.

In accordance with 10 CFR 50.55a(a)(3), an alternative to the examination requirements of the 1989 Edition of ASME XI is proposed. The majority of bolted connections, borated for the purpose of controlling reactivity, are located inside containment, in high radiation areas that are difficult to access. Code Case N-533-1 is especially significant to BVPS since many of the connections are examined at Mode 3, during plant startup, under sub-atmospheric containment conditions. Mode 3 conditions are required to obtain the necessary test pressure. Removal of insulation from the bolted connections for this examination requires subsequent reinstallation of insulation and disassembly and removal of scaffolding from containment under sub-atmospheric conditions. These conditions adversely impact personnel safety, resulting in an undue burden without a compensating

increase in the level of quality and safety. The Mode 3 examination is a critical path activity and normally has a short duration of approximately 4 to 6 hours. Efforts associated with insulation removal from the bolted connections will delay reactor criticality resulting in increased outage durations and costs.

The basis of the proposed alternative is that borated water leaves a visible residue when leakage occurs at bolted connections. Boric acid residue is evidence of leakage and its discovery is not dependent on whether the system piping is under pressure at the time of the visual VT-2 examination. Therefore an effective examination can be performed for boric acid leakage without applying the test pressure to the bolted connection. If boric acid residue is found at a bolted connection, it is evaluated as a leak, requiring corrective action in accordance with IWA-5250.”

#### 3.1.4 Licensee's Proposed Alternative:

The alternative provisions to paragraph IWA-5242(a) will be those identified in Code Case N-533-1 (as follows):

- A system pressure test and VT-2 visual examination shall be performed each refueling outage for Class 1 connections, and each period for Class 2 and 3 connections without removal of insulation.
- The insulation shall be removed from the bolted connection, each refueling outage for Class 1 connections and each period for Class 2 and 3 connections, and a VT-2 visual examination shall be performed. The connection is not required to be pressurized. Any evidence of leakage shall be evaluated in accordance with IWA-5250.

### 3.2 STAFF EVALUATION

The Code requires the removal of all insulation from pressure-retaining bolted connections in systems borated for the purpose of controlling reactivity when performing VT-2 visual examinations during system pressure tests. For Class 1 systems the Code requires this examination each refueling outage, while Class 2 and 3 systems are required to receive this examination each inspection period. As an alternative to the Code requirements, the licensee has proposed to use Code Case N-533-1, *Alternative Requirements for VT-2 Visual Examination of Class 1, 2 and 3 Insulated Pressure Retaining Bolted Connections, Section XI, Division 1*, for borated Class 1, 2 and 3 systems at BVPS - 1 and 2. This code case was originally written for Class 1 systems (Code Case N-533). The licensee has been authorized to implement the alternative examination specified in Code Case N-533 for Class 1 bolted connections in a safety evaluation dated October 8, 1997. That safety evaluation allows the licensee to perform the VT-2 visual examination with the insulation in place during a system pressure test following a minimum 4-hour hold time, and requires the insulation be removed from Class 1 bolted connections each outage to perform direct visual examinations for evidence of leakage. Under the licensee's proposal for Class 2 and 3 systems, the code case rules would be the same except that the inspection frequency would be the Code required frequency of every inspection period as stated in Code Case N-533-1.

The staff finds for Class 1, 2 and 3 systems, the alternative in Code Case 533-1 provides an acceptable approach to ensuring the leak-tight integrity of systems boroated for the purpose of controlling reactivity. The approach includes a system pressure test and VT-2 visual examination will be performed each period for Class 2 and 3 systems and each outage for Class 1 systems. The staff finds use of this code case acceptable based on utilization of a minimum 4-hour hold time for the system pressure test. The 4-hour hold time will allow any leakage to penetrate the insulation, thus providing a means of detecting any significant leakage with the insulation in place. By removing the insulation each outage for Class 1 systems and each inspection period for Class 2 and 3 systems, the licensee will be able to detect minor leakage indicated by the presence of boric acid crystals or residue. The staff finds that this two-step approach will provide an acceptable level of quality and safety, and that the licensee's proposed alternatives will provide reasonable assurance of integrity for pressure-retaining bolted connections in Class 1, 2 and 3 systems.

#### 4.0 CONCLUSION

The NRC staff has evaluated the licensee's October 11, 1999, submittal for BVPS-1 and 2. The staff finds that the use of Code Case N-533-1, for use on Class 1, 2 and 3 systems following a system pressure test with a minimum 4-hour hold time, will provide an acceptable level of quality and safety and that the licensee's proposed alternatives will provide reasonable assurance of integrity for pressure-retaining bolted connections in Class 1, 2 and 3 systems. Therefore, the proposed alternative contained in BV3-N-533-1 is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the remainder of the third interval at BVPS-1 and for the remainder of the second interval at BVPS-2; or until such time that Code Case N-533-1 is published in a future revision of Regulatory Guide (RG) 1.147. At that time, if the licensee intends to continue to implement Code Case N-533-1, the licensee should follow all the provisions in Code Case N-533-1 with the limitations issued in RG 1.147, if any.

Principal Contributor: A. Keim

Date: January 31, 2000