

**Peter P. Sena III**  
Site Vice President

724-682-5234  
Fax: 724-643-8069

April 3, 2008  
L-08-123

10 CFR 54

ATTN: Document Control Desk  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**SUBJECT:**

Beaver Valley Power Station, Unit Nos. 1 and 2  
BV-1 Docket No. 50-334, License No. DPR-66  
BV-2 Docket No. 50-412, License No. NPF-73  
Reply to Request for Additional Information for the Review of Beaver Valley Power Station, Units 1 and 2, License Renewal Application (TAC Nos. MD6593 and MD6594), License Renewal Application Amendment No. 4, and Revised License Renewal Boundary Drawings

Reference 1 provided the FirstEnergy Nuclear Operating Company (FENOC) License Renewal Application for the Beaver Valley Power Station (BVPS). Reference 2 provided License Renewal Application Boundary Drawings. Reference 3 requested additional information from FENOC regarding BVPS license renewal scoping in Section 2.1 of the BVPS License Renewal Application. This letter provides the FENOC reply to the U.S. Nuclear Regulatory Commission (NRC) request for additional information (RAI). This letter also provides Amendment No. 4 to the BVPS License Renewal Application and revised License Renewal Application Boundary Drawings originally provided in Reference 2, based on changes resulting from the FENOC reply to the NRC RAI.

The Attachment provides the FENOC reply to the NRC RAI. Enclosure A provides Amendment No. 4 to the BVPS License Renewal Application. Enclosure B provides revised BVPS License Renewal Application Boundary Drawings.

There are no regulatory commitments contained in this letter. If there are any questions or if additional information is required, please contact Mr. Clifford I. Custer, Fleet License Renewal Project Manager, at 724-682-7139.

A108  
NRR

I declare under penalty of perjury that the foregoing is true and correct. Executed on April 3, 2008.

Sincerely,



Peter P. Sena III

References:

1. FENOC Letter L-07-113, "License Renewal Application," August 27, 2007.
2. FENOC Letter L-07-118, "License Renewal Application Boundary Drawings," August 27, 2007.
3. NRC Letter, "Request for Additional Information for the Review of the Beaver Valley Power Station, Units 1 and 2, License Renewal Application (TAC Nos. MD6593 and MD6594)," March 5, 2008.

Attachment:

Reply to Request for Additional Information Regarding Beaver Valley Power Station, Units 1 and 2, License Renewal Application, Section 2.1

Enclosures:

- A. Amendment No. 4 to the BVPS License Renewal Application
- B. Revised BVPS License Renewal Application Boundary Drawings

cc: Mr. K. L. Howard, NRC Project Manager  
Mr. S. J. Collins, NRC Region I Administrator

cc: w/o Attachment or Enclosures  
Dr. P. T. Kuo, NRC Director, Division of License Renewal  
Mr. D. L. Werkheiser, NRC Senior Resident Inspector  
Ms. N. S. Morgan, NRR Project Manager  
Mr. D. J. Allard, Director BRP/DEP  
Mr. L. E. Ryan (BRP/DEP)

ATTACHMENT  
L-08-123

Reply to Request for Additional Information Regarding  
Beaver Valley Power Station, Units 1 and 2,  
License Renewal Application, Section 2.1  
Page 1 of 19

**Question RAI 2.1-1**

**10 CFR 54.4(a)(1)(iii) requires that plant systems, structure, and component (SSC) within the scope of license renewal (LR) include safety-related SSCs, which are those relied upon to remain functional during and following design-basis events (as defined in 10 CFR 50.49(b)(1)) to ensure “the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure comparable to the guidelines in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11, as applicable.”**

**During the scoping and screening methodology audit, performed at the facility December 3-6, 2007, the staff noted the definitions of “safety-related” used to identify SSCs within the scope of LR as contained in the License Renewal Application (LRA). The LR scoping procedures and the text of the plant classification document agree with the definition contained in 10 CFR Part 54.4(a)(1)(iii). However, the form/procedure used to initially populate the equipment data base, and subsequently relied upon to identify safety-related SSCs, refers only to 10 CFR Part 100. Units 1 and 2 have been approved for use of the alternate source term and, therefore, 10 CFR 50.67(b)(2) is applicable. This issue applies to BVPS Units 1 and 2.**

**The staff requests that the applicant provide a written evaluation that addresses the impact, if any, of (1) the use of a differing definition of “safety-related,” and of (2) not having explicitly considered in its scoping methodology for BVPS those structures, systems, or components that are relied upon to ensure “the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposures comparable to the guidelines in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11 of this chapter, as applicable,” consistent with the CLB.**

**RESPONSE RAI 2.1-1**

**There was no impact on License Renewal (LR) scoping due to the worksheet error regarding the definition of “safety-related.” FENOC explicitly considered those systems, structures, or components (SSCs) that are relied upon to ensure, “...the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposures comparable to the guidelines in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11 of this chapter, as applicable,” consistent with the current licensing basis (CLB).**

The Quality Class Determination Worksheet reference to 10 CFR 100 alone, instead of including 10 CFR 50.67 and 10 CFR 50.34, was an error. This conclusion is based upon the fact that the Alternate Source Term (AST) methodology and inputs for determining post-design bases accident (DBA) radiological doses under 10 CFR 50.67 were incorporated into the BVPS licensing bases as a result of the BVPS Unit 1 and 2 License Amendments listed at the end of this response. The Unit 1 and 2 Waste Gas System Ruptures, however, are still assessed under the provisions of 10 CFR 100.11; thus, the Quality Class Determination Worksheets should refer to both dose criteria, as applicable. The Quality Class Determination Worksheet was revised to correct the error. The parent procedure that provides detailed steps for performing a safety classification using the Quality Class Determination Worksheet included the correct reference to, "...10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11, as applicable."

Background:

Implementation of 10 CFR 50.67 acts to increase post-DBA dose margin by redefining the dose limits to individuals at the site Exclusion Area Boundary (EAB) and in the Low Population Zone (LPZ). It also changed the reactor core damage sequences under a limiting DBA such that the radionuclide population during fission product release is less limiting.

Therefore, as a result of implementation of 10 CFR 50.67, certain safety-related equipment was no longer required to be credited for mitigation of DBA radiological consequences. Examples include the Control Room Emergency Bottled Air Pressurization System (CREBAPS, which has been removed for the common control room), and the Supplementary Leak Collection and Release System (SLCRS) charcoal filters at both Units. In addition, the need to maintain the BVPS Containments in a sub-atmospheric condition to contain radionuclide inventories post-loss of coolant accident (LOCA) was no longer required. Thus, classification using 10 CFR 100 instead of 10 CFR 50.67 would lead to conservative quality classification results.

The CLB accident analyses themselves (except the Waste Gas System Rupture discussed above) have all been re-performed, as described in BVPS Unit 1 UFSAR, Chapter 14, and Unit 2 UFSAR, Chapter 15, in accordance with 10 CFR 50.67, and are described as such. The 10 CFR 50.67 limits, which differ from the 10 CFR 100 limits, are also listed in the UFSAR. Since these analyses were re-performed in accordance with 10 CFR 50.67, and since the parent procedure for quality classification contained the correct reference to 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11, the use of 10 CFR 100 limits in the reclassification process would be identified as an obvious error.

Omission of reference to 10 CFR 50.34 in the Quality Class Determination Worksheet would not affect quality determinations made using the worksheet, as 10 CFR 50.34 is

applicable to construction permits, and is not applicable for changes made to licensed facilities.

Unit 1 License Amendments Invoking 10 CFR 50.67

1. License Amendment 241 (ML012330496): Selective Implementation of an AST.
  - Fuel Handling Accident
2. License Amendment 257 (ML032530204): Selective Implementation of an AST.
  - Loss of Coolant Accident
  - Control Rod Ejection Accident
3. License Amendment 273 (ML060240146): Expanded Selective Implementation of an AST.
  - Main Steam Line Break Accident Outside Containment
  - Steam Generator Tube Rupture
  - Locked Rotor Accident
  - Loss of AC Power Accident
  - Small Line Break Accident Outside Containment
4. License Amendment 275 (ML061720248): Full Implementation of an AST.
  - Loss of Coolant Accident
  - Control Rod Ejection Accident
  - Fuel Handling Accident
  - Main Steam Line Break Accident Outside Containment
  - Steam Generator Tube Rupture
  - Locked Rotor Accident
  - Loss of AC Power Accident
  - Small Line Break Accident Outside Containment

Unit 2 License Amendments Invoking 10 CFR 50.67

1. License Amendment 121 (ML012330496): Selective Implementation of an AST.
  - Fuel Handling Accident
2. License Amendment 139 (ML032530204): Selective Implementation of an AST.
  - Loss of Coolant Accident

- Control Rod Ejection Accident
3. License Amendment 156 (ML061720248): Full Implementation of an AST.
- Loss of Coolant Accident
  - Control Rod Ejection Accident
  - Fuel Handling Accident
  - Main Steam Line Break Accident Outside Containment
  - Steam Generator Tube Rupture
  - Locked Rotor Accident
  - Loss of AC Power Accident
  - Small Line Break Accident Outside Containment

### **Question RAI 2.1-2**

**The LRA states that the application was developed in accordance with the guidance of NEI 95-10, Revision 6, which the NRC has endorsed via Regulatory Guide 1.188. NEI 95-10 contains a definition of “equivalent anchor”, which includes a combination of restraints or supports such that the nonsafety-related piping and associated structures and components attached to safety-related SSCs are included in scope up to a boundary point that encompasses of at least two supports in each of three orthogonal directions. Equivalent anchors are one method used to define the portion of nonsafety-related pipe, attached to safety-related SSCs, to be included within the scope of LR in accordance with 10 CFR 54.4(a)(2).**

**During the NRC scoping and screening methodology audit, performed at the facility December 3-6, 2007, the applicant indicated that equivalent anchors had been used to identify portions of nonsafety-related pipe to be included within the scope of LR. However, the applicant indicated that in certain cases, combinations of less than two restraints or supports in each of the three orthogonal directions had been used as equivalent anchors to determine the portions of nonsafety-related pipe, attached to safety-related SSCs, to be included within the scope of LR. This issue applies to BVPS Units 1 and 2.**

**The staff requests that the applicant provide a written evaluation to address your review of this issue. Indicate if the review concludes that use of the scoping methodology precluded the identification of nonsafety-related SSCs that could interact with safety-related SSCs, and which were not specifically exempted by your current licensing basis (CLB), and therefore should have been considered within the scope of LR. Describe any additional scoping evaluations to be performed to address the 10 CFR 54.4(a)(2) criteria.**

**As part of your response, please address the extent of condition (the number and location of equivalent anchors which contained less than two supports in each of the three orthogonal directions). List any additional SSCs included within the scope as a result of your efforts, and list those structures and components for which aging management reviews were conducted. For each structure and component, describe the aging management programs, as applicable, to be credited for managing the identified aging effects.**

### **RESPONSE RAI 2.1-2**

**A review was conducted of the evaluations for nonsafety-related piping directly attached to safety-related piping for which groups of supports were used to define an endpoint for LR scoping. This review identified some additional nonsafety-related components that were added to scope to ensure that each such combination of supports included at least**

two supports in each of three orthogonal directions (or the scoping terminated at another alternative specifically identified by NEI 95-10, Appendix F, such as a base-mounted component).

Scoping for the boundaries of nonsafety-related piping components that are directly connected to safety-related components relied upon engineering evaluations of combinations of supports for a total of 48 safety/nonsafety transitions. Those engineering evaluations provided conclusions that the piping beyond the scoping boundary was not required to provide support to the attached safety-related components, but did not identify whether the evaluation specifically verified two supports in each of three orthogonal directions. The piping configuration for each of the 48 safety/nonsafety transitions that relied upon a group of supports was reevaluated in response to this question. The existing evaluations for 33 transitions were confirmed to encompass at least two supports in each of three orthogonal directions. The remaining 15 transitions required additions to the depictions of the scoping boundary shown on the applicable LR Boundary Drawings. The changes are summarized below. In two cases, the scoping boundary was expanded to include components that resulted in a clarifying change to an Aging Management Review (AMR), but the changes did not result in a new combination of component / material / environment / aging effect, so the AMR results did not change. No changes in response to this RAI resulted in a change to the LRA. It should be noted that no Unit 2 drawing changes were required as a result of this review. LRA Boundary Drawing changes are summarized below:

List of affected LR Drawings and transition letters, and changes to scoping

- 1-07-2 [D-5] at CH-56  
LR Drawing 1-07-2 was changed to depict the endpoint “D” of in-scope piping to the downstream side of CH-55. The endpoint “D” was identified as the endpoint of a stress calculation that encompasses the safety/non-safety transition. This change did not add any new component / material / environment / aging effect combination, and did not affect any AMR results.
- 1-07-3 [A-7] at CH-163  
LR Drawing 1-07-3 was changed to depict endpoints “F” of in-scope piping to anchor between PCV-CH-118 and CH-66 and to a 3-way restraint between PCV-CH-119 and CH-68. This change added some piping and valves to scope, but did not add any new component / material / environment / aging effect combination, and did not affect any AMR results.
- 1-07-3 [A-8] at PCV-CH-108  
LR Drawing 1-07-3 was changed to depict endpoints “F” of in-scope piping to anchor between PCV-CH-118 and CH-66 and to a 3-way restraint between PCV-CH-119 and CH-68. This change added some piping and valves to scope, but did not add

any new component / material / environment / aging effect combination, and did not affect any AMR results.

- 1-07-3 [A-8] at CH-166

LR Drawing 1-07-3 was changed to depict endpoints “F” of in-scope piping to anchor between PCV-CH-118 and CH-66 and to a 3-way restraint between PCV-CH-119 and CH-68. This change added some piping and valves to scope, but did not add any new component / material / environment / aging effect combination, and did not affect any AMR results.

- 1-07-3 [B-7] at PCV-CH-109

LR Drawing 1-07-3 was changed to depict endpoints “F” of in-scope piping to anchor between PCV-CH-118 and CH-66 and to a 3-way restraint between PCV-CH-119 and CH-68. This change added some piping and valves to scope, but did not add any new component / material / environment / aging effect combination, and did not affect any AMR results.

- 1-08-1

Piping and valves were added to scope due to a change in another system. See discussion, below, for affected drawings “1-14A-1 [D-4] at TV-1SS-111A2” and “1-14A-2 [E-8] at TV-SS-118B”.

- 1-09-2

Piping was added to scope due to a change in another system. See discussion, below, for affected drawings “1-14A-1 [D-4] at TV-1SS-111A2” and “1-14A-2 [E-8] at TV-SS-118B”.

- 1-12-1 [E-8] at TV-1CV-102-1

LR Drawing 1-12-1 was changed to expand scoping to include radiation monitor sample pump 1RM-P-RM-215. All piping from the safety/non-safety transition is now in-scope to a base-mounted component. The change resulted in an update to the system AMR background report, but did not add any new component / material / environment / aging effect combination, and did not affect any AMR results.

- 1-12-1 [E-7] at Penetration 92

LR Drawing 1-12-1 was changed to expand scoping to LR Drawing 1-46-2 for transition “E”. LR Drawing 1-46-2 was changed to depict endpoint “E” on the downstream side of HY-187 [D-1]. This change added some piping and a valve to scope, but did not add any new component / material / environment / aging effect combination, and did not affect any AMR results.

- 1-12-1 [E-7] at TV-1CV-102

LR Drawing 1-12-1 was changed to depict endpoints on ¾"-PAS-11, upstream of the reducer on 1-½"-CV-11, and to 1CV-P-1B (as a base-mounted component) for transition "B". This change added some piping, valves, and a vacuum pump to scope. The change required an update to an LRA background AMR report to address the addition of the vacuum pump, but did not add any new component / material / environment / aging effect combination, and did not affect any AMR results.

- 1-14A-1 [D-4] at TV-1SS-111A2

LR Drawing 1-14A-1 transition flag "A" was changed to "SR/NSR Boundary Notes: 1" to depict the scoping changes that occurred on LR Drawings 1-14A-2, 1-09-2 and 1-08-1. Piping from LR Drawing 1-14A-1 [D-4] continues onto LR Drawing 1-14A-2 [F-8]. Piping and a valve were added to scope on LR Drawing 1-14A-2 continuing onto LR Drawing 1-09-2 [A-8]. Piping and a valve were added to scope on LR Drawing 1-09-2 continuing on to LR Drawing 1-08-1 [A-8 & E-8]. Piping and valves were added to scope on LR Drawing 1-08-1. All piping from TV-1SS-111A2 is in scope or in scope to a base-mounted component. This change added some piping and valves to scope, but did not add any new component / material / environment / aging effect combination, and did not affect any AMR results.

- 1-14A-2 [E-8] at TV-SS-118B

LR Drawing 1-14A-2 transition flag "A" was changed to "SR/NSR Boundary Notes: 1" to depict the scoping changes that occurred on LR Drawings 1-14A-1, 1-09-2 and 1-08-1. Piping from LR Drawing 1-14A-1 [D-4] continues onto LR Drawing 1-14A-2 [F-8]. Piping and a valve were added to scope on LR Drawing 1-14A-2 continuing onto LR Drawing 1-09-2 [A-8]. Piping and a valve were added to scope on LR Drawing 1-09-2 continuing on to LR Drawing 1-08-1 [A-8 & E-8]. Piping and valves were added to scope on LR Drawing 1-08-1. All piping from TV-SS-118B is in scope or in scope to a base-mounted component. This change added some piping and valves to scope, but did not add any new component / material / environment / aging effect combination, and did not affect any AMR results.

- 1-19-1 [A-4] at GW-85

LR Drawing 1-19-1 was changed to depict endpoints "A" of in-scope piping to locations between Surge Tank GW-TK-2 and valve GW-50. Endpoint "A" on the downstream side of GW-86 was not changed. This change added some piping to scope, but did not add any new component / material / environment / aging effect combination, and did not affect any AMR results.

- 1-19-1 [A-5] at GW-84

LR Drawing 1-19-1 was changed to depict endpoints "A" of in-scope piping to locations between Surge Tank GW-TK-2 and valve GW-50. Endpoint "A" on the downstream side of GW-86 was not changed. This change added some piping to scope, but did not add any new component / material / environment / aging effect combination, and did not affect any AMR results.

- 1-24-1 [B-7] at 1WT-506

LR Drawing 1-24-1 was changed to depict endpoint "D" on the upstream side of the tee leading to 1WT-506. Note that this drawing also depicts a change showing FCV-FW-479(489)(499) and FCV-FW-478(488)(498) as being safety-related components, with support endpoints identified at the upstream header. These changes did not add any new component / material / environment / aging effect combination, and did not affect any AMR results.

- 1-30-1 [E-5] at 1RW-61

LR Drawing 1-30-1 was changed to depict endpoints "A" on the downstream side of MOV-1RW-110B, the piping tee upstream of 1RW-3 and at REJ-1RW-12A. Endpoint "A" at the piping tee upstream of 1RW-3 was evaluated as the moment of inertia ratio of 30"-WR-171 to 10"-SWW-14. Loads imposed on pipe 10"-SWW-14 would not adversely affect pipe 30"-WR-171. Endpoint "A" at REJ-1RW-12A is a flexible connection where loads would not be transferred across the flexible connection. This change did not add any new component / material / environment / aging effect combination, and did not affect any AMR results.

- 1-46-2 [F-8] at HY-147

LR Drawing 1-46-2 was changed to depict endpoint "E" on the piping tee upstream of HY-147. This change added some piping to scope, but did not add any new component / material / environment / aging effect combination, and did not affect any AMR results. See also affected drawing "1-12-1 [E-7] at Penetration 92," above, for additional changes.

See Enclosure B to this letter for copies of revised LRA Boundary Drawings.

### **Question RAI 2.1-3**

**The Beaver Valley Power Station (BVPS) LRA states that the limits of the NRC Office of Inspection and Enforcement Bulletin (IEB) 79-14, Seismic Analyses for As-built Safety-Related Piping Systems, evaluations as shown on isometric or other controlled engineering drawings, were used to identify the portions of nonsafety-related piping, attached to safety-related SSCs, to be included within the scope of LR in accordance with the requirements of 10 CFR 54.4(a)(2).**

**The staff requests that the applicant provide a discussion to specifically address how the information obtained in the walk-downs previously performed in support of IEB 79-14 was used to identify either a seismic anchor or an equivalent anchor, as defined in Appendix F of NEI 95-10, Revision 6, in order to determine the portion of the nonsafety-related pipe to be included within the scope of LR in accordance with 10 CFR 54.4(a)(2). This issue applies to BVPS, Units 1 and 2.**

**The staff requests that the applicant provide a written evaluation to address the review of this issue. Indicate if the review concludes that use of the scoping methodology precluded the identification of nonsafety-related SSCs that could interact with safety-related SSCs, and which were not specifically exempted by your CLB, and therefore should have been considered within the scope of LR. Describe any additional scoping evaluations to be performed to address the 10 CFR 54.4(a)(2) criteria.**

**As part of your response, list any additional SSCs included within the scope as a result of your efforts, and list those structures and components for which aging management reviews were conducted. For each structure and component, describe the aging management programs, as applicable, to be credited for managing the identified aging effects.**

### **RESPONSE RAI 2.1-3**

The limits of walkdowns performed for NRC Office of Inspection and Enforcement Bulletin (IEB) 79-14 are equivalent to the NEI 95-10, Revision 6, criteria for equivalent anchors or alternatives. No additional SSCs have been included in scope as a result of the response to this RAI.

IEB 79-14 identified that, during resolution of IEB 79-02 and 79-04 concerns, inspection by the Office of Inspection and Enforcement and by licensees of the as-built configuration of several piping systems revealed a number of nonconformances to design documents which could potentially affect the validity of seismic analyses.

IEB 79-14 requested utilities to verify that their seismic analyses applied to the actual configuration of safety-related piping systems. The specific text of IEB 79-14 states, in

part: "All power reactor facility licensees and construction permit holders are requested to verify, unless verified to an equivalent degree within the last 12 months, that the seismic analysis applies to the actual configuration of safety-related piping systems."

Due to the date of IE Bulletin, the actions taken at Unit 2 to ensure the validity of seismic analysis were incorporated into the design and construction effort, and no notations related to IEB 79-14 appear on the Unit 2 piping or isometric drawings. LR scoping related to the use of IEB 79-14 notations on isometric piping drawings at BVPS is limited to Unit 1.

As part of the response to IEB 79-14 for BVPS Unit 1, the architectural engineer (Stone and Webster) generated detailed formal stress analyses for the safety-related piping systems. The calculations revised for IEB 79-14 remain, for the most part, the analytical basis for BVPS Unit 1 safety-related piping. Subsequent modifications to the piping have been qualified in revisions to these same calculations.

As dictated by IEB 79-14, field walkdowns were performed on the piping required to complete the analyses. The site procedures that controlled the piping analyses and walkdowns specified inclusion of piping in the analyses and walkdowns up to an equivalent translational anchor, or to branch piping that is significantly less stiff and less massive than the pipe being analyzed. The equivalent translational anchor is defined in the site procedures as a "hanger or combination of hangers which restrains the piping in 3 orthogonal directions." The site procedures also defined the stiffness and massiveness threshold for inclusion in analyses to be a moment of inertia ratio of pipe run to branch pipe less than or equal to 10. The limits of IEB 79-14 walkdowns, therefore, represent an anchor or a combination of supports that correspond to NEI 95-10; appendix F, paragraph 4.3, "equivalent anchor", which includes, "...a series of supports that have been evaluated as a part of a plant-specific piping design analysis to ensure that forces and moments are restrained in three orthogonal directions." In some cases, the limit of IEB 79-14 walkdowns may represent an analysis boundary corresponding to a branch line with a moment of inertia ratio of greater than 10, consistent with NEI 95-10, Appendix F, Section 4, "alternative f" (a smaller branch line, ...[for which] the moment of inertia ratio must be determined on a plant-specific basis).

The results of the IEB 79-14 field walkdowns, including any as-built dimensional changes and pipe support modifications made as a result of the reanalysis, were shown on revised isometric drawings. In addition, the boundaries of the IEB 79-14 field walkdowns were noted on the isometrics. Thus, the analytical boundaries of the current piping calculations are depicted by the IEB 79-14 walkdown boundaries as shown on the isometrics. These boundaries were used to determine the limits of scoping for nonsafety-related piping components that are directly connected to safety-related components.

Therefore, relative to the use of isometric drawing notes identifying the limits of IEB-79-14 walkdowns, the LR scoping methodology used at BVPS did not preclude

identification of any nonsafety-related components whose failure could prevent satisfactory accomplishment of any of the functions identified in 10 CFR 54.4(a)(1). No additional SSCs have been added to scope as a result of the response to this question.

**Question RAI 2.1-4**

**The applicant identified certain components classified as “Q” (a BVPS term used to identify safety-related components) which are located within the nonsafety-related turbine building. However, the identified “Q” components were not included within the scope of LR in accordance with 10 CFR 54.4(a)(1). In addition, neither the turbine building nor the nonsafety-related SSCs in the vicinity of the “Q” components were included within the scope of LR in accordance with 10 CFR 54.4(a)(1) or (a)(2) as applicable. This issue applies to BVPS, Units 1 and 2.**

**The staff requests that the applicant provide a written evaluation to address your review of this issue. Indicate if the review concludes that use of the scoping methodology precluded: (1) the identification of safety-related SSCs which should have included within the scope of LR in accordance with 10 CFR 54.4(a)(1), and (2) the identification of nonsafety-related SSCs that could interact with safety-related SSCs, and which were not specifically exempted by your CLB, and therefore should have been considered within the scope of LR in accordance with 10 CFR 54.4(a)(2). Describe any additional scoping evaluations to be performed to address the 10 CFR 54.4(a)(1) and (a)(2) criteria.**

**As part of your response, list any additional SSCs included within the scope as a result of your efforts, and list those structures and components for which aging management reviews were conducted. For each structure and component, describe the aging management programs, as applicable, to be credited for managing the identified aging effects.**

**RESPONSE RAI 2.1-4**

Descriptions of equipment supports in the Unit 1 Turbine Building have been updated within the civil AMR reports to clarify that all supports associated with in-scope components are within the scope of LR. No other SSCs have been added to scope as a result of this RAI.

Some instrumentation (both Units), some Unit 2 component supports associated with that instrumentation, and the Unit 1 River Water discharge piping components are the only “Q” components in the Turbine Buildings. This response does not further address the safety-related River Water discharge piping components in the Unit 1 Turbine Building, or the Turbine Building structures themselves, as these topics are addressed in the response to RAI 2.1-5.

Some instrumentation in the Turbine Buildings is conservatively assigned the classification of “Q” (all safety-related equipment is assigned “Q” classification) in the plant equipment database, but is not relied upon to remain functional during or following

design basis events. All instrumentation in this category is within the scope of LR, but is screened out as active electrical components, and is not subject to aging management review. Additionally, the "Q" component supports in the Unit 2 Turbine Building are associated with the Unit 2 turbine first stage pressure transmitters and instrument piping, which were assigned a 10 CFR 54.4(a)(3) function for input to the Anticipated Transient Without Scram (ATWS) Mitigation System Actuation Circuitry (with instrument piping highlighted in red on LR Drawing 2-26-1). The LRA does not provide the level of detail to confirm that the specific component supports associated with the Unit 2 "Q" instrumentation piping are within scope. However, the Unit 2 Turbine Building civil AMR did not exclude or limit the scope of component supports. Therefore, all components in the Turbine Buildings with a "Q" designation in the plant equipment database are within scope for LR.

Circuit failure analyses were performed and concluded that any faults associated with instrumentation in the Turbine Buildings that is classified "Q" in the plant equipment database would not result in a loss of any safety-related function. The faults considered were grounds, conductor shorts, open circuits, hot shorts with other cables in the same raceway or enclosure, and high impedance faults. Therefore, while these instruments and supports are assigned a quality classification "Q" in the plant equipment database, the classification is conservative, and these components do not perform a 10 CFR 54.4(a)(1) function, as documented within the BVPS CLB. Since the "Q" instruments can fail in any of the ways stated above without loss of safety function, and do not perform a 10 CFR 54.4(a)(1) function, failures of nearby nonsafety-related components cannot interact with these components in any way to result in a loss of a safety function. The evaluations also apply to the Unit 2 instrument supports, which are also classified "Q", since the failure of any supports would not result in any new failure modes for the instrumentation. Nonsafety-related components in the vicinity that interact with the instrumentation supports cannot result in loss of a safety-related function.

Relative to the "Q" instrumentation and instrumentation supports in the Turbine Buildings, the LR scoping methodology used at Beaver Valley Power Station did not preclude identification of safety-related SSCs which should have been included within the scope of LR. However, as described in the response to RAI 2.1-5, supports and miscellaneous civil commodities (e.g., cable trays, conduits, panels, grating) for in-scope Unit 1 Turbine Building equipment other than those associated with the Dedicated Auxiliary Feedwater Pump were incorrectly omitted from evaluation in the civil AMR report, and have been added to the civil AMR reports for the Turbine Buildings. The Structures Monitoring Program will manage aging of the component supports and other civil commodities associated with in-scope components in the Turbine Buildings. These additional component supports and commodities are already represented in the LRA, AMR Table 3.5.2-36, and the clarification within the Turbine Building AMR reports did not result in any additional LRA Table 2 rows (including Table 3.5.2-31 for the Turbine Buildings and Table 3.5.2-36 for Bulk Structural Commodities).

The LR scoping methodology did not preclude the identification of any other nonsafety-related SSCs whose failure could prevent satisfactory accomplishment of any of the functions identified in 10 CFR 54.4(a)(1). However, an additional 10 CFR 54.4(a)(2) intended function was added for the Turbine Buildings, as described in the response to RAI 2.1-5.

See Enclosure A to this letter for the revision to the BVPS LR Application.

**Question RAI 2.1-5**

**(A) A safety-related portion of the Unit 1 river water pipe, which consists of pipe and an elastic expansion joint, was included within the scope of LR in accordance with 10 CFR 54.4(a)(1). This portion of the river water pipe exits from the safety-related main steam cable vault pipe tunnel (included within the scope of LR in accordance with 10 CFR 54.4(a)(1)) and enters the nonsafety-related turbine building. However, neither the turbine building, nor the nonsafety-related SSCs located in the turbine building and in the vicinity of the river water pipe, have been included within the scope of LR in accordance with 10 CFR 54.4(a)(1) or (a)(2) as applicable. In addition, the river water pipe supports located the turbine building, which provide structural support to the safety-related river water pipe, were not included within the scope of LR.**

**(B) The turbine building is contiguous with the main steam cable vault pipe tunnel with no wall or door providing separation between the interiors of the two structures. The main steam cable vault pipe tunnel is safety-related and contains safety-related SSCs, all of which are included within the scope of LR in accordance with 10 CFR 54.4(a)(1). However, neither the turbine building, nor the nonsafety-related SSCs located in the turbine building and in the vicinity of the opening to the main steam cable vault pipe tunnel, have been included within the scope of LR in accordance with 10 CFR 54.4(a)(2).**

**(C) The turbine building is adjacent to the safety-related service building which was included within the scope of LR in accordance with 10 CFR 54.4(a)(1). However, the turbine building, although directly adjacent to a safety-related structure, has not been included within the scope of LR in accordance with 10 CFR 54.4(a)(2). These issues apply to BVPS Units 1. The staff requests that the applicant provide a written evaluation to address your review of these issues.**

**Indicate if the review concludes that use of the scoping methodology precluded: (1) the identification of safety-related SSCs which should have included within the scope of LR in accordance with 10 CFR 54.4(a)(1), and (2) the identification of nonsafety-related SSCs that could interact with safety-related SSCs, and which were not specifically exempted by your CLB, and therefore should have been considered within the scope of LR in accordance with 10 CFR 54.4(a)(2). Describe any additional scoping evaluations to be performed to address the 10 CFR 54.4(a)(1) and (a)(2) criteria.**

**As part of your response, list any additional SSCs included within the scope as a result of your efforts, and list those structures and components for which aging management reviews were conducted. For each structure and component, describe the aging management programs, as applicable, to be credited for managing the identified aging effects.**

RESPONSE RAI 2.1-5

(A) A 10 CFR 54.4(a)(2) function to, "Prevent damage to adjacent safety-related structures due to collapse during a seismic event or tornado," has been added to the (in-scope) Turbine Buildings lists of intended functions in the BVPS LRA, Section 2.4.31. Also, the civil AMR reports have been updated to clarify that component supports and commodities associated with in-scope components in the Turbine Buildings are in scope. No additional SSCs were added to scope in accordance with either 10 CFR 54.4(a)(1) or (a)(2) as a result of this RAI.

Interactions between nonsafety-related components and the mechanical piping components associated with the safety-related River Water discharge line in the Main Steam Cable Vault (MSCV) Pipe Tunnel, and in the Turbine Building southwest corner, were evaluated for LR scoping. The function of these safety-related River Water piping components is to provide a discharge flowpath for River Water that has already performed its function of removing heat from plant components. However, piping pressure boundary integrity is not required for this function, and a loss of integrity would not result in a loss of discharge flow. The Unit 1 UFSAR, Section 9.9.3 (page 9.9-7), addresses loss of piping integrity at this location:

*"The entire system is designed as a Seismic Category I system (refer to Appendix B) and is tornado and missile protected up to the entrance into the Turbine Building. If this piping in the Turbine Building were lost, the river water system would continue to operate. The Turbine Building basement would be filled with river water up to El. 708 ft. Water would then spill out the tube withdrawal opening in the north wall of the building and flow into the north yard and downhill to the river."*

Loss of piping integrity is, therefore, considered by the current licensing basis, and will not result in loss of any safety-related function. Therefore, failure of nonsafety-related components that could result in loss of piping integrity would not result in loss of any safety function.

Crushing of the line (e.g., by pipe whip) was not part of the high energy line break analysis criteria, and is, therefore, considered a hypothetical failure resulting from system interdependencies that is not part of the CLB, and that has not been previously experienced. NEI 95-10 states that consideration of this type of failure is not required for License Renewal scoping under 10 CFR 54.4(a)(2).

The potential for the nonsafety-related Turbine Buildings themselves to fail and interact with the adjacent safety-related structure(s) was not initially identified in the BVPS LRA. The Turbine Buildings are currently within the scope of LR, with functions associated with 10 CFR 54.4(a)(3) identified. A 10 CFR 54.4(a)(2) function has been added to the Turbine Buildings lists of intended functions to address the potential for their failure to result in spatial interactions with adjacent safety-related structures. Additionally, all

supports for in-scope components in the Turbine Buildings have been clarified to be within scope for LR within civil AMR reports.

The LR scoping methodology used at Beaver Valley Power Station did not preclude identification of safety-related SSCs which should have been included within the scope of LR. The Turbine Buildings were not previously assigned an (a)(2) function, but were in scope for (a)(3) functions. Descriptions of equipment supports in the Turbine Buildings have been updated within the civil AMR reports to indicate that supports for all in-scope components are within the scope of LR.

(B) As described above, the Turbine Buildings were already within the scope of LR, and a 10 CFR 54.4(a)(2) scoping criteria function has been added to the list of intended functions for each building. No other SSCs were added to scope as a result of this RAI.

The only safety-related components in the MSCV Pipe Tunnel are the River Water discharge piping components (addressed above, piping integrity not required) and the Auxiliary Steam System isolation valves HYV-1AS-101A and -101B. These valves, their actuators and power supplies are safety-related (and in scope) for their intended function of isolating the supply of auxiliary steam to the MSCV and Auxiliary Building upon detection of high temperature in those areas (to mitigate a downstream auxiliary steam line break in those buildings). The isolation function is active, and pressure boundary integrity of the valves is not required to prevent a supply of steam to downstream components, so loss of integrity would not cause a loss of function. The valves fail closed on loss of power, so loss of power would not result in a loss of function. The direct current (DC) panel source of power to each valve is protected by breakers that are coordinated to ensure that a circuit fault downstream of a valve's individual power supply breaker, which would result in this breaker tripping and loss of power to the valve, will not result in loss of the DC panel power supply. Therefore, failure of nonsafety-related components that could result in loss of piping integrity, or in loss of power to the valves, would not result in loss of any safety function.

Therefore, for components within the MSCV Pipe Tunnel and the adjacent nonsafety-related SSCs both in the Pipe Tunnel and in the Turbine Building, the LR scoping methodology used at Beaver Valley Power Station did not preclude identification of safety-related SSCs which should have been included within the scope of LR, and did not preclude the identification of any nonsafety-related components whose failure could prevent satisfactory accomplishment of any of the functions identified in 10 CFR 54.4 (a)(1).

(C) The potential for the nonsafety-related Turbine Buildings (at both units) themselves to fail and interact with the adjacent safety-related structure(s) was not initially identified in the BVPS LRA. The Turbine Buildings are currently within the scope of LR, with functions associated with 10 CFR 54.4(a)(3) identified. A 10 CFR 54.4(a)(2) function has been added to the Turbine Buildings lists of intended functions to address the

potential for their failure to result in spatial interactions with adjacent safety-related structures.

For the topic of Turbine Buildings scoping, the LR scoping methodology used at Beaver Valley Power Station did not preclude identification of safety-related SSCs which should have been included within the scope of LR. However, supports and miscellaneous civil commodities (e.g., cable trays, conduits, panels, and grating) for in-scope Unit 1 Turbine Building equipment other than those associated with the Dedicated Auxiliary Feedwater Pump were incorrectly omitted from evaluation in the civil AMR report, and have been added to the civil AMR reports for the Turbine Buildings. The Structures Monitoring Program will manage aging of the component supports and other civil commodities associated with in-scope components in the Turbine Buildings. These additional component supports and commodities are already represented in the LRA, AMR Table 3.5.2-36, and the clarifications within the Turbine Building AMR reports do not result in any additional LRA Table 2 rows (including Table 3.5.2-31 for the Turbine Buildings and Table 3.5.2-36 for Bulk Structural Commodities). The LR scoping methodology did not preclude the identification of any other nonsafety-related SSCs whose failure could prevent satisfactory accomplishment of any of the functions identified in 10 CFR 54.4 (a)(1). However, an additional 10 CFR 54.4(a)(2) intended function was added for each of the Turbine Buildings.

See Enclosure A to this letter for the revision to the BVPS LR Application.

## **ENCLOSURE A**

**Beaver Valley Power Station (BVPS), Unit Nos. 1 and 2**

**Letter L-08-123**

**Amendment No. 4 to the  
BVPS License Renewal Application**

Page 1 of 2

**Section Affected**

2.4.31

The Enclosure identifies the correction by Affected Section, License Renewal Application Page No., and Affected Paragraph and Sentence. The count for the affected paragraph, sentence, bullet, etc. starts at the top of the affected page. Below each section the reason for the change is identified, and the sentence affected is printed in italics with deleted text lined-out and added text underlined.

<u>Affected Section</u>	<u>License Renewal Application Page No.</u>	<u>Affected Paragraph and Sentence</u>
Section 2.4.31	Page 2.4-93	10 CFR 54.4(a)(2), new bullet
<p>An intended function is incorrectly omitted from this section and should be added. A new bulleted function is added to the list of 10 CFR 54.4(a)(2) intended functions, and it reads, "<del>None</del> <u>Prevent damage to adjacent safety-related structures due to collapse during a seismic event or tornado.</u>"</p>		

**The 11 Drawings specifically referenced in Enclosure B have been processed into ADAMS.**

**These drawings can be accessed by NRC Staff members within the ADAMS package or by performing a search on the Document/Report Number.**

## **ENCLOSURE B**

**Beaver Valley Power Station (BVPS), Unit Nos. 1 and 2**

**Letter L-08-123**

### **Revised License Renewal Application Boundary Drawings**

The following License Renewal Application Boundary Drawings  
are revised and are enclosed:

<b>LR Drawing 1-07-2</b>	<b>Revision 4</b>
<b>LR Drawing 1-07-3</b>	<b>Revision 6</b>
<b>LR Drawing 1-08-1</b>	<b>Revision 4</b>
<b>LR Drawing 1-09-2</b>	<b>Revision 4</b>
<b>LR Drawing 1-12-1</b>	<b>Revision 5</b>
<b>LR Drawing 1-14A-1</b>	<b>Revision 7</b>
<b>LR Drawing 1-14A-2</b>	<b>Revision 5</b>
<b>LR Drawing 1-19-1</b>	<b>Revision 5</b>
<b>LR Drawing 1-24-1</b>	<b>Revision 6</b>
<b>LR Drawing 1-30-1</b>	<b>Revision 5</b>
<b>LR Drawing 1-46-2</b>	<b>Revision 5</b>