UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 24, 2014

Mr. Theodore S. Robinson, Esquire
Staff Attorney
Citizen Power
2121 Murray Avenue
Pittsburgh, PA 15217

Dear Mr. Robinson:

I am responding to your letters to Mr. Peter Bamford, former Nuclear Regulatory Commission (NRC) project manager for Beaver Valley Power Station (BVPS), dated May 16, 2013,[1] and November 26, 2013,[2] in which you expressed concerns regarding the containment liner inspection program implemented by FirstEnergy Nuclear Operating Company (FENOC) at BVPS, Units 1 and 2.

As described in letters dated June 17, 2009,[3] October 24, 2009,[4] and March 8, 2010,[5] the NRC staff considers the degradation of the containment liner plate an important issue because the liner plate, in conjunction with the concrete behind the liner, provides an essentially leak-tight pressure barrier during all postulated accident conditions. The NRC staff's evaluation in the "Safety Evaluation Report Related to the License Renewal of the Beaver Valley Power Station, Units 1 and 2," issued by letter dated June 8, 2009,[6] and Supplement 1 to the NRC staff's Safety Evaluation Report (SER) issued by letter dated October 6, 2009,[7] assessed the information provided by FENOC related to its containment liner inspection program and concluded that the commitments made by the licensee for the visual and volumetric examinations of the liner plate are acceptable and provide reasonable assurance that aging effects of the containment liner plate at BVPS, Units 1 and 2, will continue to be adequately managed such that the liners' intended functions will be maintained during the period of extended operation.

On April 30, 2013,[8] the NRC staff issued a review of the license renewal commitments regarding supplemental volumetric examinations of the BVPS Unit 1 containment liner. The NRC staff noted that all of the measured values from the initial evaluation were above the acceptance criteria. Additionally, the NRC staff noted that the licensee had clear guidance in its site procedures regarding identifying possibly degraded areas with a "breadth and shape." Prior to this safety evaluation, the licensee identified a possible degraded area, which was properly dispositioned and identified for follow-up inspections. Therefore, it was concluded by the NRC staff that the licensee provided the requested acceptance criteria, demonstrated that all measured values were above the acceptance criteria, and adequately explained how the areas below the nominal thickness value are identified for future monitoring. It was concluded that the

[1] Agencywide Documents Access and Management System (ADAMS) Accession No. ML13151A075.
[2] ADAMS Accession No. ML13339A708.
[3] ADAMS Accession No. ML091550750.
[4] ADAMS Accession No. ML092230728.
[5] ADAMS Accession No. ML100560345.
[6] ADAMS Accession No. ML091600216.
[7] ADAMS Accession No. ML092520531.
[8] ADAMS Accession No. ML13112A275.

information provided demonstrates that the licensee completed the actions described in Commitment Nos. 32, 33, and 34 of NUREG-1929, "Safety Evaluation Report Related to the License Renewal of Beaver Valley Power Station, Units 1 and 2," Supplement 1, Appendix A.

In October 2013, a specialist inspector from the NRC Region I office conducted a review of FENOC's implementation of in-service inspection (ISI) program activities for monitoring degradation of the reactor coolant system boundary, risk-significant piping and components, and containment systems during the BVPS, Unit 1, refueling outage 1R22. The sample selection was based on the inspection procedure objectives and risk priority of those pressure retaining components in these systems where degradation would result in a significant increase in risk. The inspector conducted an onsite inspection and subsequently completed an in-office review of non-destructive examination (NDE) procedures and completed NDE records to verify that the NDE activities performed were conducted in accordance with the requirements of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 2001 Edition, 2003 Addenda. The results of this inspection can be found in NRC Integrated Inspection Report 05000334/2013005 and 05000412/2013005 dated February 10, 2014.[9]

We appreciate the comments provided in your letters dated May 16, 2013, and November 26, 2013. Below are specific responses to items that you addressed in your letters:

1. Nominal v. Original Thickness Issue from the letter dated May 16, 2013

Codes and standards governing the design, construction or inservice inspection of metallic liners of concrete containments specify requirements and acceptance criteria based on nominal plate thickness, and not actual (i.e., original) thickness, because it is a practical measure of acceptable manufactured thickness of the liner as a whole. By definition, variations from nominal thickness in rolled plates used for the liner are within the range of specified acceptable milling or rolling tolerances (plus and minus) such that the average thickness of the plate is no less than the nominal thickness. Pursuant to 10 CFR 50.55a, "Codes and Standards," metallic shell or liners of containments are required to meet the inservice inspection requirements of the ASME Code, Section XI, Subsection IWE, which specifies general acceptance criteria for flaws and degradation based on the nominal liner thickness. The acceptance standard in IWE-3000 allows local areas with measured thickness (by ultrasonic testing) below 90 percent of the nominal thickness (representative of a loss of base metal greater than 10 percent of nominal thickness) to be accepted by engineering evaluation, if it can be shown by analysis that the reduced thickness satisfies the design specifications. This evaluation provides reasonable assurance that the liner will continue to perform its intended function. Such areas are subject to supplemental examinations per IWE-3200 and augmented re-examination in subsequent inspection periods, in accordance with IWE-2420, until the flaw or degradation remains essentially unchanged in consecutive inspection periods. While the alternate methodology proposed in the letter dated May 16, 2013, to assess metal loss is theoretically more accurate, that level of accuracy is not warranted in practice because localized loss of metal up to 10 percent of nominal thickness is accommodated in the general design margins and is not safety significant. The licensee's use of the nominal thickness parameter is consistent with the acceptance standard in the codes and the regulations.

[9] ADAMS Accession No. ML14041A003.

2. Adequacy of Leak Rate Testing Issue from the letter dated November 26, 2013

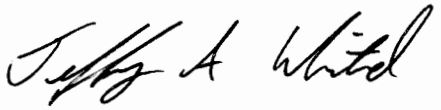
The statement in your letter dated November 26, 2013, that an integrated leak rate test (ILRT) was performed and passed for Unit 1 following repair of both the 2009 and 2013 localized liner breaches, is not factually correct. Periodic ILRTs are conducted at BVPS in accordance with the performance-based risk-informed interval based on the implementing document for Option B of the 10 CFR Part 50, Appendix J Program, and a plant-specific risk assessment. The last periodic ILRT, pursuant to 10 CFR Part 50 Appendix J, was conducted and passed in 2006 for Unit 1, following restoration of the containment opening after steam generator replacement, and in 2008 for Unit 2. Only a local leak rate test (LLRT), to ensure leak-tightness of the repair welds, is required following repairs such as those in 2009 and 2013 to repair the localized liner breaches. Further, none of the limited localized through-wall corrosion cases of the containment liner found thus far in the industry operating experience, including the ones at BVPS, Unit 1, are considered significant enough to be detected by an ILRT or in itself result in leakage that would exceed the 10 CFR Part 50 Appendix J acceptance criteria for an ILRT. The containment leakage rate testing program (ILRT and LLRTs), pursuant to 10 CFR Part 50, Appendix J, and the containment inservice inspection program, pursuant to 10 CFR 50.55a(g), together provide reasonable assurance that the structural and leak-tight integrity of the containment structure is maintained through its service life.

3. Purpose of the Concrete Containment Structure Issue from the letter dated November 26, 2013

The containment structure serves as the third and final pressure-retaining boundary and barrier against fission product release in the event of an unlikely loss-of-coolant accident. The reinforced concrete shell structure and the anchored steel liner provide structural and leak-tight integrity of the containment. The concrete shell provides the structural integrity, but also provides radiation shielding and leakage integrity to a certain degree. Because concrete is inherently subject to cracking and porosity, the steel liner plate is included in the design to serve as an essentially leak-tight membrane; it is not considered to contribute to the structural integrity of the concrete shell.

In summary, the NRC staff has reviewed your comments and has concluded that no changes to the conclusions in our safety evaluation are necessary. Thank you for contacting the NRC staff with your concerns. If you have any further concerns, please contact me at 301-415-4090, or via e-mail at Jeffrey.Whited@nrc.gov.

Sincerely,



Jeffrey A. Whited, Project Manager
Office of Nuclear Reactor Regulation
Division of Operating Reactor Licensing
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Sincerely,
/RA/
Jeffrey A. Whited, Project Manager
Office of Nuclear Reactor Regulation
Division of Operating Reactor Licensing
Licensing Projects Branch I-2

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