

December 27, 2007

Mr. Peter P. Sena III
Site Vice President
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
Mail Stop A-BV-SEB1
P.O. Box 4, Route 168
Shippingport, PA 15077

SUBJECT: GENERIC LETTER 2004-02 "POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY RECIRCULATION DURING DESIGN BASIS ACCIDENTS AT PRESSURIZED WATER REACTORS" EXTENSION REQUEST APPROVAL FOR BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2 (TAC NOS. MC4665 AND MC4666)

Dear Mr. Sena:

Generic Letter (GL) 2004-02 (Agencywide Documents Access and Management System Accession No. ML042360586) identified potential susceptibility of pressurized-water reactor recirculation sump screens to debris blockage during design-basis accidents requiring recirculation operation of emergency core cooling systems (ECCS) or containment spray systems (CSS), and on the potential for additional adverse effects due to debris blockage of flowpaths necessary for ECCS and CSS recirculation and containment drainage. The GL requested that all corrective activities be completed no later than December 31, 2007.

By letter dated December 20, 2007, you requested an extension for certain activities associated with your response to GL 2004-02. The Nuclear Regulatory Commission staff has evaluated the information provided in your letter and concludes that for Beaver Valley Power Station, Unit Nos. 1 and 2, it is acceptable to extend the due date for completion of corrective actions, as described in the enclosed staff's evaluation, until February 29, 2008.

Please contact me at 301-415-1016, if you have any questions on this matter.

Sincerely,

/RA by Douglas V. Pickett for/

Nadiyah S. Morgan, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-334 and 50-412

Enclosure:
As stated

cc w/encl: See next page

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Beaver Valley Power Station, Unit Nos. 1 and 2

cc:

Joseph J. Hagan
President and Chief Nuclear Officer
FirstEnergy Nuclear Operating Company
Mail Stop A-GO-19
76 South Main Street
Akron, OH 44308

James H. Lash
Senior Vice President of Operations
and Chief Operating Officer
FirstEnergy Nuclear Operating Company
Mail Stop A-GO-14
76 South Main Street
Akron, OH 44308

Danny L. Pace
Senior Vice President, Fleet Engineering
FirstEnergy Nuclear Operating Company
Mail Stop A-GO-14
76 South Main Street
Akron, OH 44308

Jeannie M. Rinckel
Vice President, Fleet Oversight
FirstEnergy Nuclear Operating Company
Mail Stop A-GO-14
76 South Main Street
Akron, OH 44308

David W. Jenkins, Attorney
FirstEnergy Corporation
Mail Stop A-GO-15
76 South Main Street
Akron, OH 44308

Manager, Fleet Licensing
FirstEnergy Nuclear Operating Company
Mail Stop A-GO-2
76 South Main Street
Akron, OH 44308

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

Director, Fleet Regulatory Affairs
FirstEnergy Nuclear Operating Company
Mail Stop A-GO-2
76 South Main Street
Akron, Ohio 44308

Manager, Site Regulatory Compliance
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
Mail Stop A-BV-A
P.O. Box 4, Route 168
Shippingport, PA 15077

Richard Anderson
Vice President, Nuclear Support
FirstEnergy Nuclear Operating Company
76 South Main Street
Mail Stop A-GO-14
Akron, Ohio 44308

Commissioner James R. Lewis
West Virginia Division of Labor
749-B, Building No. 6
Capitol Complex
Charleston, WV 25305

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

Director, Pennsylvania Emergency
Management Agency
2605 Interstate Dr.
Harrisburg, PA 17110-9364

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

cc:

Dr. Judith Johnsrud
Environmental Coalition on Nuclear Power
Sierra Club
433 Orlando Avenue
State College, PA 16803

Director
Bureau of Radiation Protection
Pennsylvania Department of
Environmental Protection
Rachel Carson State Office Building
P.O. Box 8469
Harrisburg, PA 17105-8469

Mayor of the Borough of Shippingport
P.O. 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
P.O. Box 298
Shippingport, PA 15077

BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2
GSI-191/GL 2004-02 EXTENSION REQUEST APPROVAL

By letter dated December 20, 2007, First Energy Nuclear Operating Company (FENOC, the licensee) requested an extension to the corrective action due date of December 31, 2007, stated in Nuclear Regulatory Commission (NRC) Generic Letter (GL) 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors," for the Beaver Valley Power Station (BVPS), Unit Nos. 1 and 2. The licensee's letter supersedes a previous FENOC letter to the NRC dated December 7, 2007. By letter dated April 3, 2006, FENOC previously requested that completion of the BVPS Unit 2 installation of the recirculation spray system (RSS) pump start signal and the high pressure safety injection throttle valve gap sizing modifications be extended until completion of the Unit 2 spring 2008 refueling outage, scheduled to begin on April 14, 2008. By letter dated May 18, 2006, the NRC determined that it is acceptable to extend the completion date for the RSS pump start signal installation and throttle valve gap sizing modifications on Unit 2 until the completion of the Unit 2 spring 2008 refueling outage.

FENOC has taken actions as described in its letters dated March 4, 2005, July 22, 2005, and September 21, 2006, toward bringing BVPS into compliance with GL 2004-02, including replacement of the sump screens with substantially larger sump strainers during the Unit 2 fall 2006 refueling outage and the Unit 1 fall 2007 refueling outage. Furthermore, FENOC is continuing their evaluation of the adequacy of the replacement strainers.

However, in addition to strainer replacement and the Unit 2 throttle valve modifications, the FENOC passive screen design has open industry issues in need of resolution. The outstanding items are:

1. Assessment of the chemical effects testing, formalization of results, and development of a corrective action plan based on these results. This evaluation will be performed in accordance with the guidance provided in WCAP-16530-NP, "Evaluation of Post-Accident Chemical Effects in Containment Sump Fluids to Support GSI-191," dated February 2006.
2. Revision of previously developed downstream effects analysis in accordance with WCAP-16406-P, Revision 1, "Evaluation of Downstream Debris Effects in Support of GSI-191."
3. Evaluation of in-vessel downstream effects in accordance with the guidance provided in WCAP-16793-NP, Revision 0, "Evaluation of Long-Term Cooling Considering Particulate, Fibrous, and Chemical Debris in the Recirculating Fluid."

Enclosure

The criteria for granting an extension to the due date of December 31, 2007, for completion of GL 2004-02 corrective actions are stated in SECY-06-0078. Specifically, an extension may be granted if:

- the licensee has a plant-specific technical/experimental plan with milestones and schedule to address outstanding technical issues with enough margin to account for uncertainties, and
- the licensee identifies mitigative measures to be put in place prior to December 31, 2007, and adequately describes how these mitigative measures will minimize the risk of degraded emergency core cooling system (ECCS) and containment spray system (CSS) functions during the extension period.

With regard to the first extension criterion, FENOC has a plant-specific technical/experimental plan, with milestones and schedules, to complete the GL 2004-02 corrective actions. Specifically, the licensee stated that it has completed the following actions:

1. Installation of replacement sump strainers at Unit 1 and Unit 2.
2. Evaluation of downstream effects, which resulted in modifications to the high pressure safety injection throttle valves. These modifications have been completed on Unit 1 and are scheduled for completion on Unit 2 in the spring of 2008.
3. Modification of the start signal for the RSS pumps. This modification has been completed on Unit 1 and is scheduled for completion on Unit 2 in the spring of 2008.
4. Completion of chemical effects testing. However, the evaluation of the results will not be completed by the end of 2007; it is scheduled to be accomplished by February 29, 2008.

The licensee stated that the following actions are in progress:

1. Assessment of the chemical effects testing results, which includes formalization of the results, and development of a plan of action for additional modifications if needed.
2. Revision of downstream effects analyses in accordance with recent industry guidance in WCAP 16406-P.

The licensee stated that the following actions are planned:

1. Removal of insulation inside the containment buildings at both BVPS Unit 1 and Unit 2. FENOC will replace insulation to the extent practical in the upcoming spring refueling outage for BVPS Unit 2. The scope of the insulation remediation to fully address the issue is currently unknown. It is expected that the scope will be identified by February 29, 2008, at which time the extent of the needed insulation replacement for both units will be identified.
2. Completion of Unit 2 throttle valve modifications by the end of the Unit 2 spring 2008 refueling outage.

With regard to the second extension criterion, the licensee has stated that the following modifications, mitigation measures, compensatory measures, and/or favorable conditions are in effect at BVPS Units 1 and 2, minimizing the risk of degraded ECCS and CSS functions during the extension period:

1. Installation of the new sump strainers on Units 1 and 2. These strainers have increased the available surface area to deal with debris in the recirculation water from approximately 130 sq. ft. to 3400 sq. ft. in Unit 1 and from approximately 150 sq. ft. to 3300 sq. ft. in Unit 2.
2. Replacement of BVPS Unit 1 and Unit 2 high pressure safety injection cold leg throttle valves to increase the throttle valve gap.
3. Changing the BVPS Unit 1 and Unit 2 start signal for the RSS pumps from a fixed time delay to an Engineered Safety Features Actuation System signal based on a refueling water storage tank level low signal coincident with a containment pressure high-high signal to allow sufficient pool depth to cover the sump strainer before initiating recirculation flow.
4. Replacement of the BVPS Unit 1 reactor vessel closure head insulation from borated Temp Mat insulation encapsulated in reflective metal insulation to reflective metal insulation alone during the spring 2006 refueling outage, in order to reduce particulate loading on the sump strainer.
5. Installation of new reflective metal insulation on the BVPS Unit 1 replacement steam generators and associated piping in the vicinity of the steam generators during the spring 2006 refueling outage.
6. Completion of prototype testing of new strainer design for BVPS Units 1 and 2.

The licensee also noted several other favorable factors that are applicable to BVPS Units 1 and 2. These include a compartmentalized containment that makes transport of debris difficult, a delay of 20-30 minutes after a loss-of-coolant accident occurs before recirculation begins (which would allow some debris to settle to the containment floor and not reach the strainer) and a containment coatings inspection and evaluation program to be implemented starting with the BVPS Unit 2 spring 2008 refueling outage.

The NRC believes that FENOC has a reasonable plan for BVPS Units 1 and 2 that should result in the installation of final GSI-191 modifications that provide acceptable strainer function with adequate margin for uncertainties. Furthermore, the NRC has concluded that FENOC has put mitigation measures in place at BVPS Units 1 and 2 to adequately reduce risk for the requested 2-month extension period.

FENOC has committed to submit a status report for both ex-vessel and in-vessel downstream evaluations and assessment of chemical effects testing results no later than February 29, 2008. FENOC has also committed to implement a containment coatings inspection program on both units starting with the Unit 2 spring 2008 refueling outage. Finally, FENOC has committed to replace insulation to the extent practical in the upcoming Unit 2 spring 2008 outage and to

advise the NRC of scope and schedule for corrective actions for BVPS Units 1 and 2 in its February 29, 2008, submittal.

Based on the above mentioned commitments and on the licensee having satisfactorily addressed the applicable NRC criteria as discussed above, it is acceptable to extend the completion date for certain corrective actions for the issues discussed in GL 2004-02 as discussed above until February 29, 2008, for BVPS Units 1 and 2. The NRC agrees with BVPS commitments in its letter dated December 20, 2007, indicating high priority for completing its remaining actions, including insulation changes, and updating the plants' licensing bases as soon as possible. In particular, the NRC expects BVPS to make every effort to replace problem insulation (as identified) in the upcoming refueling outages for both units (spring 2008 for Unit 2 and spring 2009 for Unit 1). Should corrective actions (e.g., insulation removal) beyond February 29, 2008, be identified as necessary, BVPS will need to submit an additional extension request to the NRC.

In addition to the status report discussed above, the NRC expects BVPS to submit a supplemental response by February 29, 2008, to GL 2004-02 to the NRC consistent with the NRC letter to the Nuclear Energy Institute dated November 30, 2007.