

February 29, 2008

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

Dear Mr. Sena:

Generic Letter (GL) 2004-02 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 (NRC) staff evaluated the information provided in your letter and concluded that for Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and 2), it was acceptable to extend the due date for completion of corrective actions until February 29, 2008.

By letter dated February 14, 2008, you requested an extension for certain BVPS-1 and 2 sump blockage corrective actions. The NRC staff evaluated the information provided in your letter and concluded that (1) for BVPS-1, it is acceptable to extend the due date for completion of GL 2004-02 corrective actions, as described in the enclosed NRC staff's evaluation, until September 30, 2008 and (2) for BVPS-2, it is acceptable to extend the due date for completion of GL 2004-02 corrective actions until March 31, 2009, or 60 days after NRC approval of a combined buffer change and containment overpressure credit license amendment request, whichever is sooner, as described in the enclosed NRC staff's evaluation.

P. Sena

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

Sincerely,

/RA/

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

P. Sena

- 2 -

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Enclosure:
As stated

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ADAMS Accession No.: ML081230116

*See memo dated February 28, 2008

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

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EXTENSION REQUEST APPROVAL
RELATED TO GL 2004-02 CORRECTIVE ACTIONS
FIRSTENERGY NUCLEAR OPERATING COMPANY
FIRSTENERGY NUCLEAR GENERATION CORP.
OHIO EDISON COMPANY
THE TOLEDO EDISON COMPANY
BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2
DOCKET NOS. 50-334 AND 50-412

By letter dated December 20, 2007 (Agencywide Document Access and Management System (ADAMS) Accession No. ML073620201), FirstEnergy Nuclear Operating Company (FENOC, licensee) requested an extension to the 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," corrective actions due date of December 31, 2007, for Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and 2).

By letter dated December 27, 2007 (ADAMS Accession No. ML073600373), the NRC approved an extension for completion of certain GL 2004-02 corrective actions for BVPS-1 and 2 to February 29, 2008. Specifically, the licensee was 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. The licensee was to implement a containment coatings inspection program on both units starting with the BVPS-2 spring 2008 refueling outage. Finally, the licensee was to replace insulation to the extent practical in the BVPS-2 spring 2008 outage and to advise the NRC of scope and schedule for corrective actions for BVPS-1 and 2 in its February 29, 2008, GL 2004-02 supplemental response letter. In the December 27, 2007 letter, the NRC stated that if corrective actions were identified as necessary beyond February 29, 2008, then an additional extension request would need to be submitted for the affected unit(s).

By letter dated February 14, 2008 (ADAMS Accession No. ML080510246), the licensee requested additional extensions for BVPS-1 and 2. In the letter, the licensee stated the following:

- An assessment of previous chemical effects testing was completed.
- An action plan was developed to address the potential uncertainties related to head loss from chemical effects and had identified corrective actions necessary to fully address GL 2004-02.

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- Based on the results of the chemical effects testing, corrective actions would be required in the form of additional testing for BVPS-1 (with possible follow-up modifications based on that testing), and licensing changes and modifications for BVPS-2.
- The additional extensions would be needed to provide time to complete the additional testing for BVPS-1 (and determine and implement any follow-up modifications), and to acquire NRC approval for the associated licensing changes for BVPS-2, and conduct needed modifications.

The NRC staff has based its review of extension requests for the due date for completion of GL 2004-02 corrective actions on criteria 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, and
- for proposed extensions beyond several months, a licensee's request will more likely be accepted if the proposed mitigative measures include temporary physical improvements to the ECCS sump or materials inside containment to better ensure a high level of ECCS sump performance.

With regard to the first extension criterion, the licensee has provided a plant-specific technical/experimental plan, with milestones and schedules, to complete the GL 2004-02 corrective actions.

The licensee stated in its February 14, 2008, letter that additional integrated chemical effects testing will be performed utilizing the specific debris mix for BVPS-1, based on calculated precipitants using the existing sodium hydroxide buffer. This testing will be completed by June 30, 2008, and a follow-up GL 2004-02 supplemental response letter detailing the results of the testing for BVPS-1 will be submitted to the NRC by August 30, 2008. The test results will be reviewed by the licensee for meeting acceptable net positive suction head (NPSH) margins. In the event BVPS-1 testing results are unfavorable and indicate the need for corrective actions, the licensee will provide the NRC with an additional corrective action extension request no later than August 30, 2008, and the corrective actions identified will be completed no later than the spring 2009 refueling outage (1R19). The details of the BVPS-1 corrective actions, if required, would be included in the August 30, 2008, follow-up supplemental response letter.

The licensee stated that the following actions are planned for BVPS-2:

- The baskets needed inside containment to support the buffer change from sodium hydroxide to sodium tetraborate will be installed during the 2R13 refueling outage in the spring of 2008.
- Related supporting analyses will be completed in order to submit a license amendment request (LAR) to the NRC for the replacement of the present sodium hydroxide buffer with sodium tetraborate by August 30, 2008.
- Analyses will be completed to support credit for the use of containment overpressure in the calculation of available ECCS and CSS pump NPSH.
- The proposed LAR will be related to the buffer change and the containment overpressure.

By letter dated February 14, 2008, the licensee stated that the implementation of the buffer change and use of containment overpressure in the calculation of available ECCS and CSS NPSH can be completed within 60 days of NRC approval of the LAR.

In addition to the above planned changes, the licensee stated that replacement of certain BVPS-2 insulation has been scheduled for completion during the 2R13 refueling outage in spring 2008. The scope of this plant modification includes replacement of Borated Temp Mat insulation encapsulated in Reflective Metal Insulation (RMI) with RMI on the BVPS-2 reactor vessel closure head flange, and replacement of Min-K insulation encapsulated in RMI with Thermal Wrap insulation encapsulated in RMI on portions of the reactor coolant system and safety injection system.

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

1. Installation of new sump strainers on BVPS-1 and 2, increasing the available screen surface area 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-1 high-pressure safety injection cold leg throttle valves to increase the throttle valve gap. The licensee has scheduled BVPS-2 to receive this modification during its spring 2008 outage.
3. Changing the BVPS-1 start signal for recirculation spray system (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. The licensee has scheduled BVPS-2 to receive this modification during its spring 2008 outage.

4. Replacement of the BVPS-1 reactor vessel closure head insulation from borated Temp Mat insulation encapsulated in RMI to RMI alone during the spring 2006 refueling outage, in order to reduce particulate loading on the sump strainer. The licensee has scheduled BVPS-2 to receive this modification during its spring 2008 outage.
5. Installation of new reflective metal insulation on the BVPS-1 replacement steam generators and associated piping in the vicinity of the steam generators during the spring 2006 refueling outage.
6. Implementation of mitigative measures in response to NRC Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors." A list of these measures is provided in the licensee's February 14, 2008, letter.

The licensee also noted several other favorable factors that are applicable to BVPS-1 and 2. These factors 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 for both units to be implemented starting with the BVPS-2 spring 2008 refueling outage.

With regard to the third extension criterion, the significant modifications discussed in the licensee's February 14, 2008, letter; in particular, the installation of large replacement strainers at BVPS-1 and 2, satisfies this extension criterion.

The NRC staff held a conference call with the licensee on February 21, 2008. In summary, the NRC staff and the licensee agreed to the following:

- The licensee will place a high priority on ensuring that the remaining chemical test to be performed for BVPS-1 would be conducted under prototypical debris bed conditions and in accordance with the latest NRC and industry guidance.
- If the BVPS-1 test results prove to be inconclusive or challenging, the licensee will submit to the NRC staff a corrective action due date extension request letter no later than August 31, 2008, and that the extension request will identify detailed corrective actions (e.g. insulation removal) and an implementation schedule. If corrective actions are necessary, the licensee plans to implement them before the end of the BVPS-1 spring 2009 refueling outage.

Based on the licensee's February 14, 2008, letter and the February 21, 2008, conference call, the NRC staff and the licensee have agreed on the following plan of action for BVPS-1 and 2:

1. Additional chemical effects testing will be performed for BVPS-1 using a predicted debris mix specific to BVPS-1, and a follow-up GL 2004-02 supplemental response letter will be provided by August 30, 2008, which will include the results of BVPS-1 chemical effects testing and the details of any completed or future corrective actions resulting from this testing, if required.

2. Based on the results of the BVPS-1 chemical effects testing, if any corrective actions are determined to be necessary beyond September 30, 2008, the licensee will submit to the NRC an extension request letter no later than August 30, 2008, that will address the additional actions needed and provide a basis for the proposed timeline for implementing the actions. While the licensee intends that any such actions be completed no later than the BVPS-1 spring refueling outage, the NRC staff reserves any conclusions regarding acceptability of proposed completion dates for any corrective actions until those actions are specified.
3. The licensee will complete supporting analyses for BVPS-2 and submit a combined LAR for the replacement of the present sodium hydroxide buffer with sodium tetraborate and the crediting of containment overpressure in the calculation of ECCS and CSS pump NPSH. The combined LAR will be submitted to the NRC by August 30, 2008.
4. Any approved BVPS-2 LAR for the buffer change and crediting of containment overpressure in the calculation of ECCS and CSS pump, NPSH will be implemented within 60 days of the approval date of the LAR or by March 31, 2009, whichever is sooner. Implementation is contingent on NRC approval of the LAR.
5. Downstream effects analyses (both in-vessel and ex-vessel) will be completed for BVPS-1 and 2 with results documented and provided in the follow-up GL 2004-02 supplemental response letter by August 30, 2008.

The NRC staff still expects the licensee to submit a GL 2004-02 supplemental response letter to the NRC by February 29, 2008, consistent with the NRC letter to the Nuclear Energy Institute dated November 30, 2007.

The NRC believes that the licensee has a reasonable plan for BVPS-1 and 2 that should result in the installation of final GL 2004-02 corrective actions that provide acceptable strainer function with adequate margin for uncertainties. Furthermore, the NRC staff has concluded that the licensee has put mitigation measures in place at BVPS-1 and 2 to adequately reduce risk for the approved extension period discussed below.

Based on the licensee having satisfactorily addressed the NRC GL 2004-02 due date extension criteria as discussed above, the NRC staff finds it is acceptable to extend the completion date for chemical effects testing and any associated corrective actions for BVPS-1 until September 30, 2008. Should the time period for potential BVPS-1 corrective actions (e.g., insulation removal for BVPS-1) be determined by the licensee to extend beyond September 30, 2008, the licensee will need to submit an additional extension request to the NRC, no later than August 30, 2008.

Based on the licensee having satisfactorily addressed the NRC GL 2004-02 due date extension criteria as discussed above, the NRC staff finds it acceptable to extend the completion date for containment buffer change and containment overpressure GL 2004-02 corrective actions for BVPS-2 until 60 days after NRC approval of the buffer change and containment overpressure LAR, or by March 31, 2009, whichever is sooner. Implementation is contingent on NRC approval of the LAR.

The licensee should complete its remaining GL 2004-02 corrective actions discussed above and update the BVPS-1 and 2 licensing bases as soon as possible.

Approval of these extensions to the GL 2004-02 corrective action due dates for BVPS-1 and 2 shall not be construed to constitute approval of the operating LAR discussed above.