



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

September 30, 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 sump blockage corrective actions associated with your response to GL 2004-02. The NRC staff evaluated the information provided in your letter and concluded that for BVPS-1, it was acceptable to extend the due date for completion of corrective actions until September 30, 2008, and for BVPS-2, it was acceptable to extend the due date for completion of 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.

By letter dated August 28, 2008, you requested an extension for certain sump blockage corrective actions associated with your response to GL 2004-02. The NRC staff evaluated the information provided in your letter and concluded that 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 startup following the spring 2009 refueling outage, which commences in April 2009. The NRC staff evaluated the information provided in your letter and determined that for BVPS-2, the corrective action due date extension request will remain under NRC staff evaluation in order to allow the NRC staff time to determine if there is the need for additional regulatory action (e.g., license conditions). The current BVPS-2 due date of March 31, 2009,

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will remain valid until the NRC staff completes its evaluation. The NRC staff has not identified any issues with the BVPS-2 corrective action plan and expects you to follow the outlined plan for BVPS- 2 as described in your August 28, 2008, letter.

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

Sincerely,

A handwritten signature in black ink, appearing to read 'M. Morgan', with a long horizontal flourish extending to the right.

Madiyah 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

Beaver Valley Power Station, Unit Nos. 1 and 2

cc: Distribution via Listserv

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will remain valid until the NRC staff completes its evaluation. The NRC staff has not identified any issues with the BVPS-2 corrective action plan and expects you to follow the outlined plan for BVPS- 2 as described in your August 28, 2008, letter.

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

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ADAMS Accession No.: ML082740241

*See memo dated September 29, 2008

**Concurrence via email

OFFICE	LPLI-1/PM	LPLI-1/LA	DSS/SSIB/BC (A)	DORL/LPLI-1/BC
NAME	NMorgan	SLittle**	DHarrison*	MKowal <i>MM6/K</i>
DATE	9/30/2008	9/30/2008	9/29/2008	<i>9/30/08</i>

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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 August 28, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML082480045), FirstEnergy Nuclear Operating Company (licensee), requested an extension to the corrective action due date of September 30, 2008, 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," (GL 2004-02), for the Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and 2). The stated intent of this extension was to allow additional time for planning and completion of the insulation modifications in BVPS- 1, completion of testing to be performed in order to identify the type and quantity of insulation required to be modified at BVPS- 2, and to finalize documentation for the supplemental response (including test reports and accompanying analyses) to GL 2004-02. The licensee requested an extension until startup following the spring 2009 refueling outage (RFO) which commences in April 2009, for BVPS-1 and until startup following the fall 2009 RFO, which commences in November 2009, for BVPS-2.

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.
- 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 (replacement of certain insulation which was scheduled for

completion during the 2R13 RFO in spring 2008, along with installation of baskets needed inside containment to support the buffer change from sodium hydroxide to sodium tetraborate). The license amendment request (LAR) for the buffer change would also require supporting analyses.

- Analyses to support credit for the use of containment overpressure (post-accident pressure) in the calculation of available emergency core cooling system (ECCS) and containment spray system (CSS) pump net positive suction head for BVPS-2 would be completed.

In its February 14, 2008, letter, the licensee requested an extension until startup following the BVPS-1 spring 2009 RFO scheduled to start on April 2009, and within 60 days of the approval of the LAR for containment buffer change and containment post-accident pressure credit for BVPS-2. The NRC approved an extension for completion of BVPS-1 and 2 sump clogging corrective actions from the GL 2004-02 due date until September 30, 2008, for BVPS-1 and until 60 days after NRC approval of the buffer change and containment overpressure LAR, or by March 31, 2009, whichever is sooner, for BVPS-2. (NRC letter dated February 29, 2008, ADAMS Accession No. ML081230116).

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 ECCS and 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. As described in the August 28, 2008, letter, testing has been completed for BVPS-1; however additional time is needed to plan and complete the insulation modifications for BVPS-1 and to finalize documentation for the supplemental response (including test reports and accompanying analyses) to GL 2004-02. A follow-up supplemental response to GL 2004-02 including the results of BVPS-1 debris and chemical effects testing, results of downstream effects analyses (both in-vessel and ex-vessel), and details of corrective actions will be submitted to the NRC by October 30, 2008. Additional required corrective actions resulting from the BVPS-1 retesting, including insulation modifications will be implemented prior to startup following the spring 2009 RFO (1R19) which commences in April 2009. These regulatory commitments are established in lieu of the BVPS-1 regulatory commitment identified in the licensee's letter dated February 14, 2008.

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 BVPS-1 and from approximately 150 sq. ft. to 3300 sq. ft. in BVPS-2.
2. Replacement of BVPS-1 high-pressure safety injection (HPCI) cold leg throttle valves to increase the throttle valve gap. HPCI throttle valves installed at BVPS-2 were modified to increase the throttle valve gap.
3. Implementation of an operating strategy that directs securing two of four recirculation spray system (RSS) pumps upon transfer to cold leg recirculation at BVPS-1 tends to reduce the fluid velocity through the emergency sump strainer.
4. Changing the BVPS-1 start signal for 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. BVPS-2 completed the modifications associated with the RSS pump start during the spring 2008 RFO (2R13).
5. Replacement of the BVPS-1 reactor vessel closure head insulation from borated Temp-Mat insulation encapsulated in reflective metal insulation (RMI) to RMI alone during the spring 2006 RFO, in order to reduce particulate loading on the sump strainer. Borated Temp-Mat™ insulation encapsulated in RMI on the BVPS-2 Reactor Vessel Closure Head flange was replaced with RMI, and Min-K™ insulation encapsulated in RMI on portions of the reactor coolant system. Safety-injection system piping was replaced with thermal wrap insulation encapsulated in RMI during the spring 2008 RFO (2R13). These modifications reduced debris loading on the sump strainer.
6. Installation of new reflective metal insulation on the BVPS-1 replacement steam generators (SGs) and associated piping in the vicinity of the SGs during the spring 2006 RFO.
7. 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 letters dated February 14, 2008, and August 28, 2008.
8. Implementation of an RFO scheduled containment cleaning program and containment coatings inspection and evaluation program for both BVPS-1 and 2, which became effective in April of 2008 and applies to RFOs beginning with the spring 2008 RFO (2R13) for BVPS-2, and the spring 2009 RFO (1R19) for BVPS-1.

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).

With regard to the third extension criterion, the significant modifications discussed in the licensee's August 28, 2008, letter; in particular, the installation of large replacement strainers at BVPS-1 and 2, satisfies this extension criterion. Additionally, the licensee's letter dated August 28, 2008, provides plant risk evaluations for BVPS-1 and 2. The NRC staff has not reviewed the analysis in detail, but agrees with the licensee's conclusion that the impact on risk for the requested extension period for actions to address chemical effects beyond the December 31, 2007, implementation date specified in GL 2004-02 is low based on the mitigative measures identified in this document.

The NRC staff held a phone conference with the licensee on September 29, 2008. In summary, the NRC and the licensee reached a mutual understanding that:

The BVPS-2 corrective action due date extension request will remain under the NRC staff evaluation in order to allow the NRC time to determine if there is the need for additional regulatory action (e.g., license conditions). The current BVPS- 2 due date of March 31, 2009, will remain valid until the NRC staff completes its evaluation. The NRC staff has not identified any issues with the BVPS-2 corrective action plan and expects the licensee to follow the outlined plan for BVPS-2 as described in the August 28, 2008, letter.

The NRC believes that the licensee has a reasonable plan for BVPS-1 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 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 insulation modifications at BVPS-1 until startup following the spring 2009 RFO which commences in April 2009. Should the RFO start 30 days after April 1, 2009, the licensee would need to submit an additional extension request letter to the NRC. The NRC expects the licensee to complete its remaining GL 2004-02 corrective actions discussed above and update the BVPS-1 licensing bases as soon as possible.