

L. William Pearce
Site Vice President

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

June 15, 2004
L-04-083

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

Subject: Beaver Valley Power Station, Unit No. 1 and No. 2
BV-1 Docket No. 50-334, License No. DPR-66
BV-2 Docket No. 50-412, License No. NPF-73
Request for Additional Information Regarding Bulletin 2003-01
(TAC Nos. MB9554 and MB9555)

References:

1. NRC Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at PWRs," dated June 9, 2003
2. Response (L-03-117) to Bulletin 2003-01 for Beaver Valley Power Station (BVPS) dated August 8, 2003

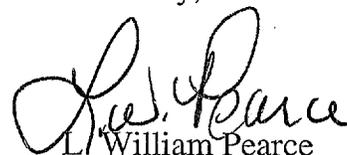
This letter provides the FirstEnergy Nuclear Operating Company (FENOC) response to the NRC Request for Additional Information (RAI) dated May 12, 2004 regarding the FENOC submittal (Reference 2) for NRC Bulletin 2003-01.

The RAI response is provided in Attachment A. Attachment B summarizes regulatory commitments contained in this letter. Due to the need for procedure validation and subsequent operator training, the commitments in Attachment B will be completed as early as February 2005, but no later than June 15, 2005.

If there are any questions concerning this matter, please contact Mr. Larry R. Freeland, Manager, Regulatory Affairs/Performance Improvement at 724-682-5284.

I declare under penalty of perjury that the foregoing is true and correct. Executed on June 15, 2004.

Sincerely,


L. William Pearce

Beaver Valley Power Station, Unit No. 1 and No. 2
Response to RAI Regarding Bulletin 2003-01
L-04-083
Page 2

Attachments:

- A. Response to RAI dated May 12, 2004
- B. Commitment List

- c: Mr. T. G. Colburn, NRR Senior Project Manager
Mr. P. C. Cataldo, NRC Sr. Resident Inspector
Mr. H. J. Miller, NRC Region I Administrator
Mr. L. E. Ryan (BRP/DEP)

Beaver Valley Power Station, Unit No. 1 and No. 2
Response to RAI Regarding Bulletin 2003-01
L-04-083
Page 3

bc: G. L. Beatty
J. J. Maracek
C. J. Eberle
K. A. Troxler
M. A. Pergar
D. S. Batina
J. J. Hagan
M. E. O'Reilly
Central File - *Keywords: RAI, Bulletin 2003-01*

ATTACHMENT A

Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at PWRs"

These responses address the NRC Request for Additional Information (RAI) dated May 12, 2004 regarding the FENOC reply (L-03-117 dated August 8, 2003) to NRC Bulletin 2003-01 for Beaver Valley Power Station (BVPS) Unit 1 and Unit 2.

RAI Item 1

The Westinghouse Owners Group (WOG) has developed operational guidance in response to Nuclear Regulatory Commission Bulletin (BL) 2003-01 for Westinghouse- and CE-type pressurized-water reactors. For BVPS-1 and 2, your response stated that you will monitor the WOG's activities and will consider implementation of any issued guidance. Please provide a discussion of the WOG-recommended compensatory measures that have been or will be implemented for your facilities. Include a discussion of the evaluations or analyses performed to determine that these compensatory measures are acceptable for BVPS-1 and 2, and provide technical justification for those WOG-compensatory measures not being implemented at BVPS-1 and 2. Also, include a detailed discussion of the procedures being modified, the operator training being implemented, and your schedule for implementing these compensatory measures.

Response

The containment sump blockage control room guideline will be implemented as an Emergency Operating Procedure (EOP) guideline at BVPS-1 and 2. The EOP guideline will apply specifically to recirculation sump blockage, and as such will be entered at either unit from ECA-1.1, "Loss of Emergency Coolant Recirculation," when indications of pump cavitation prevent establishing or maintaining at least one train of safety injection (SI) recirculation flow.

At BVPS-1, the guideline may be entered from ES-1.3, "Transfer to Cold Leg Recirculation," or ES-1.4, "Transfer to Simultaneous Hot and Cold Leg Recirculation," when indications of pump cavitation prevent establishing or maintaining at least one train of safety injection recirculation flow.

At BVPS-2, the guideline may be entered from ES-1.3, "Transfer to Cold Leg Recirculation," or ES-1.4, "Transfer to Hot Leg Recirculation," or ES-1.5, "Transfer from Hot Leg Recirculation to Cold Leg Recirculation." The difference between Unit 1 and Unit 2 is because of differing recirculation transfer designs used at each unit.

There are plant-specific differences between the reference plant and the BVPS units that will need to be addressed prior to implementing the plant-specific guideline. More

specifically, the BVPS units have separate low head safety injection pumps and residual heat removal pumps, and also do not utilize containment air coolers during accident situations.

Candidate operator actions (COA) developed by the WOG and described in WCAP-16204, "Evaluation of Potential ERG and EPG Changes to Address NRC Bulletin 2003-01 Recommendations," Appendix A that apply to Westinghouse plants have been evaluated for BVPS as follows:

COA A1a-W Operator Action to Secure One Spray Pump

The COA Section 1.0, Step 3 states, "Prior to stopping a containment spray pump, adequate heat removal should exist to allow the operator time to start the idle spray pump if the running pump fails. Verify that two or more containment fan coolers are operating"

Section 4.0, "Conclusions/Recommendations" states, "in general, implementation of this step is recommended for plants with containment air coolers capable of removing significant heat loads for the following reasons."

Therefore, there are no plans to implement this operator action at BVPS because containment fan coolers are not used under post-accident conditions.

COA A1a-Ice Addendum Westinghouse Ice Condenser Plants, Operator Action to Secure One Spray Pump

This action does not apply to the BVPS units because neither unit is an ice condenser plant.

COA A1b-W Operator Action to Secure Both Spray Pumps

There are no plans to implement this operator action at BVPS. Containment fan coolers are not used under post-accident conditions. (Refer to the evaluation of COA A1a-W).

COA A2 Manually Establish One Train of Containment Sump Recirculation Prior to Automatic Actuation

The COA Section 2.2, states that operating with one train of injection means steps to stop all spray must be implemented and steps to stop one injection train must be implemented.

Section 4.0, concludes, as general guidance that implementation of this operator action is recommended only for plants that have all of the following attributes:

1. Margin in their containment sump NPSH calculation.
2. Ability to secure one injection train.
3. Ability to secure one or both spray pumps.
4. Can refill the refueling water storage tank (RWST).

Because the BVPS units do not satisfy the conditions to manually secure one or both trains of containment spray (Refer to the response for A1a-W), there are no plans to implement this operator action at BVPS.

COA A3-W Terminate One Train of Safety Injection After Recirculation Alignment

BVPS Unit 1 and Unit 2 have “transfer to recirculation” schemes that are automatically initiated based on RWST level. There is one charging/high head safety injection pump per train. Each charging/high head safety injection pump is supplied with suction flow from a single low head safety injection pump or recirculation spray pump. Safety injection flow paths are subsequently split for long-term recirculation, such that one low head safety injection or recirculation spray pump supplies a dedicated charging/high head safety injection pump.

Because there is currently no procedural guidance for throttling the recirculation flowrate at either unit, this COA will be incorporated into the Unit 1 and Unit 2 emergency operating procedures. The changes will be validated and operator training conducted prior to making the procedures effective. This action will be completed as early as February 2005, but no later than June 15, 2005.

COA A5 Refill of Refueling Water Storage Tank

This COA addresses a possible interim compensatory measure described in Bulletin 2003-01 as “Ensure that alternative water sources are available to refill the refueling water storage tank (RWST) or otherwise provide inventory to inject into the reactor core and spray into the containment atmosphere.”

Due to dilution and potential reactivity effects, there are no plans to develop instructions at either unit to supply non-borated water for makeup to the RWST.

Currently, there are approved operating procedures at both units, which are invoked by the specific unit ECA-1.1, “Loss of SI Recirculation Capability” procedure, to commence makeup to the RWST. Procedures 1OM-7.4.Q, “Makeup to the RWST” (Unit 1) and 2OM-7.4.O, “Makeup to the RWST” (Unit 2) are

referenced in the respective plant ECA-1.1. These procedures provide makeup instructions for the RWST from the spent fuel pool or using the chemical and volume control system blender. Procedures will be revised to initiate these actions in anticipation of potential loss of recirculation capability, rather than after evidence of the loss appears. Provisions to alert the control room staff or the Technical Support Center staff to evaluate contingency actions as operators become available, such as (1) commencing batching of boric acid using the approved boric acid batching procedure and (2) makeup from the boric acid hold tank to the boric acid storage tanks, to support blender makeup to the RWST will also be made.

While it is intended that these actions would occur before the RWST is depleted, this may not be possible for all accident scenarios. This is because preparation and line-up to refill the RWST prior to recirculation may interfere with more critical operator actions in the event of a quickly evolving design basis accident LOCA.

FENOC will revise the Emergency Operating Procedures and supporting procedures as necessary to incorporate actions to makeup to the RWST as early as February 2005, but no later than June 15, 2005.

COA A6 Inject More Than One RWST Volume From a Refilled RWST or by Bypassing the RWST

There is direction in the severe accident management guidelines (SAMGs) for injecting greater than one RWST volume into the containment at each unit. The SAMGs at each unit contain a guideline for flooding containment as well as an attachment that contains a “water level versus injected water volume” graph that includes a “number of RWST volumes injected” scale.

FENOC will establish procedural guidance to take actions to inject more than one RWST volume into the containment at each unit. The changes will be validated and operator training conducted prior to making the procedures effective. This action will be completed as early as February 2005, but no later than June 15, 2005.

COA A8-W Provide Guidance on Symptoms and Identification of Containment Sump Blockage

FENOC will update the Emergency Operating Procedures (EOPs) at BVPS Units 1 and 2 to include guidance on identifying containment sump blockage. The EOPs will also be updated with the necessary transitions to the BVPS version of

the Westinghouse Owner's Group Containment Sump Blockage Control Room Guideline. Procedure changes and operator training will be completed as early as February 2005, but no later than June 15, 2005.

COA A9-W Develop Contingency Actions in Response to Containment Sump Blockage, Loss of Suction, and Cavitation

Contingency actions will be developed at BVPS Units 1 and 2 to address the response to containment sump blockage, loss of suction and cavitation. This guidance will be contained in the BVPS version of the Westinghouse Owner's Group Containment Sump Blockage Control Room Guideline. Procedure changes and operator training will be completed as early as February 2005, but no later than June 15, 2005.

COA A11 Prevent or Delay Containment Spray for Small Break LOCAs (<1.0 Inch Diameter) in Ice Condenser Plants.

This Candidate Operator Action does not apply to BVPS Units 1 and 2 since neither unit is an ice condenser plant.

RAI Item 2

In your response to BL 2003-01, you stated that guidance is given in emergency operating procedures (EOPs) to address the refueling water storage tank (RWST) refill once it has been determined that a complete loss of emergency coolant recirculation capability exists. The intent of BL 2003-01 is for licensees to consider implementing compensatory measures to reduce the risk associated with potentially degraded or nonconforming emergency core cooling system (ECCS) and containment spray system recirculation functions. As such, the timing of implementing this guidance in your EOPs may not be consistent with the intent of BL 2003-01. For large break sizes, refilling the RWST upon switchover to sump recirculation, or soon thereafter, could provide a ready source of additional make-up inventory should sump recirculation be lost. For smaller break sizes, early initiation of RWST refill, such as prior to sump recirculation, could effectively prolong the time to switchover and possibly increase the opportunity for plant recovery without necessitating switchover, thereby reducing the potential for ECCS recirculation sump blockage. In your response, you did not commit to modifying your EOPs to include refilling the RWST prior to or upon switchover to ECCS recirculation. Given the uncertainty associated with this issue, and the potential benefits of implementing this compensatory measure, please explain the basis for not including refilling the RWST earlier in your procedures.

In addition, please provide a detailed description of how your current EOPs address a loss of ECCS recirculation capability.

Response

Procedures are being revised regarding actions to refill the RWST as described in response to RAI Item 1, COA A5.

With regard to how the current Emergency Operating Procedures address a loss of ECCS recirculation capability:

BVPS Unit 1

Unit 1 ECA-1.1 is based on the generic guideline ECA-1.1. Overall actions in 1OM-53A.1.ECA-1.1, "Loss of SI Recirculation Capability" include:

1. Continue attempts to restore emergency coolant recirculation.
2. Increase/conserves RWST.
3. Initiate cooldown to cold shutdown conditions.
4. Depressurize the reactor coolant system (RCS) to minimize subcooling.
5. Try to add makeup to the RCS from an alternate source.
6. Depressurize the steam generators to cooldown and depressurize the RCS.
7. Maintain RCS heat removal.

1OM-53A.1.ECA-1.1 differs from the generic emergency response guidelines (ERGs) for the following reasons:

1. An instruction was added to the Unit 1 procedure to check for high head safety injection flow in Instruction No. 4, because the absence of recirculation flow would mean there is no safety injection flow to the core.
2. Unit 1 design has several differences from the ERG reference plant, including the following:
 - a. The containment air coolers are not used during accident conditions
 - b. Unit 1 has common charging/ high head safety injection pumps
 - c. Unit 1 does not use residual heat removal (RHR) pumps for safety injection or spray recirculation. There is no common piping that would otherwise cause the RWST to backflow into the containment sump.
 - d. Unit 1 has no RTD bypass manifolds.
3. The procedure contains instructions to place the cold overpressure protection system in service at the appropriate RCS temperature and pressure.

BVPS Unit 2

Unit 2 ECA-1.1 is based on the generic guideline ECA-1.1, “Loss of SI Recirculation Capability.” Overall actions in 2OM-53A.1.ECA-1.1, “Loss of SI Recirculation Capability” include:

1. Continue attempts to restore emergency coolant recirculation.
2. Increase/conserves RWST.
3. Initiate RCS cooldown to cold shutdown conditions.
4. Depressurize the RCS to minimize subcooling.
5. Try to add makeup to the RCS from an alternate source.
6. Depressurize the steam generators to cooldown and depressurize the RCS.
7. Maintain RCS heat removal.

2OM-53A.1.ECA-1.1 differs from the generic emergency response guidelines (ERGs) for the following reasons:

1. An instruction was added to the Unit 2 procedure to check for high head safety injection flow in Instruction No. 4, because the absence of recirculation flow would mean there is no safety injection flow to the core.
2. Unit 2 design has several differences from the ERG reference plant, including the following:
 - a. The containment air coolers are not used during accident conditions
 - b. Unit 2 has common charging/high head safety injection pumps
 - c. Unit 2 does not utilize a boron injection tank.
 - d. Unit 2 does not use RHR pumps for safety injection or spray recirculation. There is no common piping that would otherwise cause the RWST to backflow into the containment sump.
 - e. Unit 2 has no RTD bypass manifolds.
 - f. Unit 2 has an alternate charging flowpath through the safety injection lines using a hand control valve.
3. The procedure contains instructions to place the cold overpressure protection system in service at the appropriate RCS temperature and pressure.

ATTACHMENT B

Commitment List

The following list identifies those actions committed to by FirstEnergy Nuclear Operating Company (FENOC) for Beaver Valley Power Station (BVPS) Unit Nos. 1 and 2 in this document. Any other actions discussed in the submittal represent intended or planned actions by Beaver Valley. These other actions are described only as information and are not regulatory commitments. Please notify Mr. Larry R. Freeland, Manager, Regulatory Affairs/Performance Improvement, at BVPS on (724) 682-5284 of any questions regarding this document or associated regulatory commitments.

<u>Commitment</u>	<u>Due Date</u>
Revise or establish BVPS-1 and 2 procedures to address WCAP 16204 candidate operator actions A3-W, A5, A6, A8-W and A9-W. These procedure revisions are for use as an interim measure pending completion of formal containment sump evaluations at each unit. (Ref. CAs 03-07051-20 through 25)	6/15/2005