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L-03-099

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
Response to a Request for Additional Information in Support of License Amendment Requests Nos. 300 and 172

This letter provides FirstEnergy Nuclear Operating Company (FENOC) responses to the NRC Request for Additional Information (RAI) dated June 5, 2003, regarding License Amendment Requests (LAR) 300 and 172. The LARs were submitted by FENOC letter L-02-069 dated June 5, 2002. The changes proposed by the LARs will revise the Beaver Valley Power Station (BVPS) Units 1 and 2 Technical Specifications to permit each unit to be operated with an atmospheric containment.

The RAI and responses are provided in Attachment A of this letter. The responses contained in this transmittal have no impact on the proposed Technical Specification changes, or the no significant hazards consideration, transmitted by FENOC letter L-02-069.

No regulatory commitments are contained in this letter. 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 24, 2003.

Sincerely,

L. William Pearce

A001

Attachment:
A. Responses to RAI dated June 5, 2003

c: Mr. T. G. Colburn, NRR Senior Project Manager
Mr. D. M. Kern, NRC Sr. Resident Inspector
Mr. H. J. Miller, NRC Region I Administrator
Mr. D. A. Allard, Director BRP/DEP
Mr. L. E. Ryan (BRP/DEP)

Attachment A to L-03-099
Responses to RAI dated June 5, 2003

Response to Request for Additional Information (RAI)
Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and 2)
Subatmospheric to Atmospheric Containment Conversion
Docket Nos. 50-334 and 50-412

The Nuclear Regulatory Commission (NRC) staff has determined that the information below will be needed for the staff to complete its review of the licensee's request for amendment to allow conversion of the BVPS-1 and 2 containments from subatmospheric to atmospheric operation. As part of that request, the licensee requested selective implementation of an alternate source term in accordance with Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," and Title 10 of the Code of Federal Regulations, Section 50.67.

1. **Currently, as stated in the BVPS-2 Updated Final Safety Analysis Report, Table 9.4-4, the licensee takes credit for the operation of the bottled compressed air system in response to a toxic gas release or a smoke from plant fire (items 3 and 4 in table). Please state how the control room (CR) operator and CR ventilation/isolation system would respond with the compressed air system (bottled air system) removed and justify the removal of the control room emergency building air pressurization system for these events. The consequences of an unfiltered inleakage of 300 cfm or operation of control room emergency ventilation (CREV) fans if applicable should be considered in the response.**

Response to RAI Item 1.

Beaver Valley Power Station (BVPS) Unit 2 Updated Final Safety Analysis Report (UFSAR) Table 9.4-4 lists the control room area air-conditioning equipment assumed to be in operation for various plant scenarios. Item 3 addresses a toxic gas release and item 4 addresses smoke from a plant fire. Each of these items states that a bottled compressed air system is assumed to be in operation for these scenarios. As discussed below, the table items are incorrect because the control room emergency bottled air pressurization system (CREBAPS) is not used for these two scenarios. The BVPS corrective action program will track the appropriate corrections to the UFSAR and ensure they are completed in a timely manner.

The following paragraphs explain why the CREBAPS is presently not assumed to be in operation for the toxic gas release or smoke scenarios.

CREBAPS and Toxic Gases

The original plant design considered that toxic gases might result from either a leak of the onsite chlorine bottles or leaks from other toxic chemicals on site, near site or transportation accidents near the plant. In the past bottles of chlorine were stored on site because chlorine was used for water treatment at BVPS. The onsite chlorinating of water with gaseous chlorine has been discontinued and the chlorine bottles have been removed from the BVPS site. Therefore, the need for CREBAPS to provide protection from an onsite chlorine leak has been eliminated by removal of the chlorine bottles from the BVPS site.

As documented in Unit 2 UFSAR Section 2.2.3.1.2 "Toxic Chemicals" a complete evaluation of all other toxic gas hazards from onsite, offsite, and transportation sources was performed and accepted by the NRC prior to the onsite chlorine being removed. The study determined that the probability of a toxic chemical spill resulting in unacceptable exposures was less than the NRC design basis criteria and thus did not have to be included in the plant design basis.

As stated above, the CREBAPS is presently not assumed to be in operation for control room personnel protection from a toxic gas release. Therefore, the proposed elimination of the CREBAPS will not affect the toxic gas release protection afforded control room personnel, and its proposed elimination is justified.

Control Room Toxic Gas Release Protection

The response by control room personnel to a toxic gas release is prescribed by procedure. The procedure is entered if the control room receives a report of either an onsite or offsite toxic gas release, or toxic gas container carrier accident. Automatic alarm actuation is neither expected nor required. Briefly, the procedure requires sounding the standby alarm and announcing the release (or potential release) and its location on the site public address system. If warranted, site personnel and unnecessary personnel in the control room are evacuated, and a plant management notification list is started. If a possible threat to the control room is indicated, the control room is isolated. It is undesirable in this circumstance to run the emergency pressurization fans, since the filters may be ineffective in protecting against all toxic threats and may increase toxic intake into the control room area. Therefore, the procedure requires verification that the fans are not running, and if they are, it directs that they be tripped. If time permits, an operator is dispatched to secure other building ventilation systems in order to minimize the spread of the gas onsite.

If warranted, the Shift Manager may direct that control room operators don self-contained breathing apparatus, which are provisioned at the control room in accordance with the requirements of Regulatory Guide 1.78, "Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release."

To do this, operators refer to the appropriate abnormal operating procedure. When the outside air has cleared, purging toxic gas from the control room is performed using the appropriate procedure.

CREBAPS and Smoke

In the event of a plant fire, smoke detectors located in the Unit 2 control room air intake duct would provide an alarm in the control room. Per plant procedures, the control room inlet and exhaust dampers would be manually repositioned to isolate the control room and the normal HVAC system would be on 100% recirculation. In the event of smoke in the control room, the inlet, exhaust and recirculation dampers would be manually repositioned in accordance with plant procedures, to have 100% outdoor supply, 100% exhaust, and no recirculation to purge the smoke from the control room. Under the existing design and licensing basis, CREBAPS would not be activated. Thus presently, the CREBAPS bottles are not assumed to be in operation for situations involving plant fires and/or smoke in the control room. Therefore, the proposed elimination of the CREBAPS will not affect the smoke protection afforded control room personnel, and its proposed elimination is justified.

Unfiltered Inleakage

Since the CREBAPS plays no part in the toxic gas release or smoke protection afforded control room personnel, the consequences due to these events of an unfiltered inleakage of 300 cfm or operation of the control room emergency ventilation system (CREVS) fans are unaffected by the existence or absence of CREBAPS. Procedures do not include use of the CREVS fans in response to these conditions, and therefore, the consequence of their operation is considered not applicable to either the fire or toxic gas scenario.

The 300 cfm of unfiltered inleakage is associated with operation of the normal control room ventilation air conditioning units (isolation dampers closed and CREVS fans off). If running, a CREVS fan reduces the control room unfiltered inleakage to less than 10 cfm. However, the CREVS fans are not used during a fire, because the smoke can quickly overcome the HEPA filter and render the system inoperable. The CREVS fans are not used during a toxic gas release, because the charcoal filters may not be effective, depending upon the specific toxin involved. In both events, reliance is instead placed on use of self-contained breathing apparatus masks, if necessary. However, it is unlikely that masks will be necessary, since 300 cfm inleakage is small compared to the volume of the control room envelope, 173,000 cubic feet.

2. **Currently, the BVPS-1 Technical Specification (TS) 3.7.7.1 has a Limiting Condition for Operation (LCO) that requires two out of three of the emergency ventilation subsystems and associated components be OPERABLE. Assuming one BVPS-2 CREV subsystem is NOT OPERABLE, control room habitability would be maintained by the activation of the bottled air system for the first 60 minutes, the automatic initiation (at time of 60 minutes) of the operational BVPS-2 CREV subsystem second and lastly, the manual start of the CREV of BVPS-1 if the BVPS-2 subsystem failed to start. With the proposed change, the bottle air system will be deleted. CR habitability would be maintained by the automatic initiation of the operational BVPS-2 CREV subsystem and if necessary, the manual start of the BVPS-1 CREV subsystem. However, the BVPS-1 CREV subsystem is different from the BVPS-2 subsystem CREV by requiring manual rather than automatic start and requiring manual actions to open dampers. Even though credit was not taken for automatic start of the CREV and 30 minutes was assumed for manual start, some assessment of the human factors interface for the manual actions which would occur during the first 30 minutes of the postulated accident needs to be assessed. Please provide the steps necessary to start the manual CREV subsystem in the event of failure of a BVPS-2 subsystem and justification of the acceptability of manual operator actions.**

Response to RAI Item 2.

The Unit 1 CREVS isolation dampers are located a short distance from the main control room in an area below the control room that is within the control room pressure envelope. The steps necessary to start the manual CREVS subsystem, should the BVPS-2 subsystem fail to automatically start, are contained in a plant procedure which requires:

If neither Unit 2 Control Room Emergency Ventilation Fan is available, perform the following at Unit 1.

a) Dispatch an operator, with appropriate respiratory equipment, to the Ventilation Room to perform the following.

   1. Open the Control Room Emergency Ventilation Outside Air Intake Isolation Damper.

   2. Open the Control Room Emergency Air Filter Outlet Damper.

b) Start the Control Room Emergency Supply Fan.

c) Verify that the Control Room Emergency Air Fan Discharge Isolation Damper is open.

These steps are similar to the procedures used to routinely test this subsystem in accordance with Unit 1 Surveillance Requirement 4.7.7.1.1.b. The Surveillance Requirement test procedures are performed monthly by the operating shift. This routine experience gives the operating staff familiarity with the manual process of starting up a Unit 1 CREVS pressurization fan, which ensures that it will be accomplished in a timely manner in the unlikely event it is needed during an emergency. To verify that it is reasonable to assume that these steps can be accomplished within 30 minutes, the procedure was walked down with Unit 1 licensed operations personnel. An additional, unannounced, operator drill confirmed that the manual CREVS could be started within 20 minutes, which is less than the 30 minutes assumed in the analysis. Based on the above, crediting a 30 minute manual operation action to start the Unit 1 CREVS is justified.

3. In order to declare the BVPS-1 CREV subsystem OPERABLE, is it required that the manual dampers be open and the fan start be placed in and automatic mode?

Response to RAI Item 3.

The Unit 1 CREVS is considered OPERABLE when the applicable Technical Specification Surveillance Requirements are met. Unit 1 Surveillance Requirement 4.7.7.1.1.b is satisfied by manually placing the Unit 1 CREVS into service on a monthly frequency and verifying operation for at least 15 minutes. The response to Item 2 describes the steps necessary to place the system into operation. The Unit 1 CREVS manual inlet damper is not normally left open, since this would compromise the control room pressure boundary and potentially render the Unit 2 CREVS inoperable. Therefore, the Unit 1 inlet damper is normally closed. Since the Unit 1 CREVS is a manual system, having the damper closed meets the component's operability requirement.

4. With respect to the Modes of operation for LCO applicability and required actions, should it be specified that if either unit is in one of these Modes of operation, the applicability of the LCO's and Actions apply?

Response to RAI Item 4.

Each unit's Technical Specification Limiting Conditions for Operation (LCO) is written to contain the necessary requirements for the safe operation of the unit without reliance on the opposite unit's Technical Specifications. The control room pressure boundary is equipped with isolation damper pairs at both units. Both the Unit 1 and Unit 2 Technical Specifications require that all damper pairs be OPERABLE, and all damper pairs are included in the Surveillance Requirements of both units (See Unit 1 Surveillance Requirements 4.7.7.1.1.d.2 and 4.7.7.1.2.d.2 and Unit 2 Surveillance Requirement 4.7.7.1.e.2). Thus, if one unit is shut down, and not in a Mode that requires CREVS to be

operable, the operating unit's LCO protects control room personnel in the event that a design basis accident occurs in the operating unit.

5. **In the reviews of the BVPS-1 and 2 TSs, the NRC staff noticed several inconsistencies that appear to ignore the fact that there is a common control room envelope for the two control rooms:**

   a. **The BVPS-1 TSs has an ACTION that "with an emergency ventilation subsystem inlet isolation damper open and not capable of being closed, the requirements of 3.0.3 are applicable." This ACTION does not appear in the BVPS-2 TSs. Since the CR is a common area between both units, should not this ACTION, if required, apply to both units and be reflected in both units' TSs?**

Response to RAI Item 5.a.

Each unit's Technical Specifications are written to contain the necessary requirements for the safe operation of the unit without reliance on the opposite unit's Technical Specifications and are self-contained. While each unit's Control Room Habitability Technical Specifications are different, they do contain the necessary requirements to maintain the common control room pressure boundary operable. Note that the ongoing Beaver Valley Improved Standard Technical Specification Conversion Project will address the differences between the units' Technical Specifications by combining the specifications for each unit into a single set of specifications addressing both units.

The Technical Specification rules of usage provide that for those cases where an Action statement is not provided for a plant condition, Technical Specification 3.0.3 is required to be entered. Thus, if Unit 2 were in the situation described above, Technical Specification 3.0.3 would be entered because the specific action (loss of control room pressure boundary integrity due to the inlet isolation damper not being capable of being closed) is a condition that is not addressed in the Unit 2 Technical Specification Actions.

Therefore, either unit's Technical Specification, either directly through a specified Action or indirectly by default, would require entry into Technical Specification 3.0.3 should the control room pressure boundary integrity be lost due to the inlet isolation damper being incapable of closing.

   b. **The BVPS-1 TSs have a requirement on TS temperature being less than 88°F. ACTION items require shutdown in certain time frames if temperature is not returned to normal. Are there similar requirements for BVPS-2 or would it be permissible for BVPS-2 to continue operating with temperatures above the limits set for BVPS-1?**

Response to RAI Item 5.b.

Unit 2 Surveillance Requirement 4.7.7.1.a requires that the Unit 2 ambient control room air temperature be less than or equal to 88°F. If a Surveillance Requirement is not met, it results in failure to meet the LCO. Since the LCO does not contain an Action to address this condition, Technical Specification 3.0.3 would be entered. As a result, a plant shutdown would be required sooner for Unit 2 than for Unit 1, because the Unit 2 Technical Specification does not contain an Action with a 7 day allowed outage time to restore control room air temperature to within limits.

c. Are the ACTION items that are in BVPS-1 TSs (b., b.1, c., c.1) applicable to BVPS-2 and would they require BVPS-2 shutdown?

Response to RAI Item 5.c.

As discussed above, each unit's Technical Specification is self-contained for the applicable unit. There are no Actions from one unit that would require a shutdown of the other unit. The following discussion shows how the referenced Unit 1 Actions (b, b.1, c, and c.1) are addressed in the Unit 2 Technical Specification. The Technical Specification Actions being discussed are the ones on the mark-ups submitted in the License Amendment Request dated June 5, 2002.

Unit 1 Action b is addressed by the Unit 2 Modes 1, 2, 3 and 4 Action. Although the wording of these two Actions is different, they are functionally equivalent. Each action requires restoring an inoperable damper to operable status within 7 days or requires a plant shutdown.

Unit 1 Action b.1 is addressed by Unit 2 Action b. These Actions, which require the suspension of movement of irradiated fuel and fuel assemblies over irradiated fuel, are functionally equivalent. The exception being that the Unit 2 Action includes the word "recently," which is defined in Unit 2 Bases 3/4.7.7 as fuel that has occupied part of a critical reactor core within the previous 100 hours. However, Technical Specification 3.9.3, "Decay Time" requires that the reactor be subcritical for at least 100 hours, prior to movement of irradiated fuel assemblies in the reactor pressure vessel.

Unit 1 Actions c. and c.1 pertain to control room air temperature limits which are not specifically addressed in the Unit 2 Technical Specification. The response to RAI Item 5.b discusses how exceeding the Unit 2 control room air temperature limit in Surveillance Requirement 4.7.7.1.a would place Unit 2 in Technical Specification 3.0.3.

d. Is the surveillance listed in 4.7.7.1.2.d.2. applicable to each of the 3 CREV subsystems separately, or is it only necessary to show that one of the BVPS-2 subsystems starts automatically and not necessary to test either the other BVPS-2 subsystem or the BVPS-1 subsystem? Are each of the three subsystems tested to assure they can meet the requirement in TS 4.7.7.1.2.d.4.?

Response to RAI Item 5.d.

The Unit 1 Technical Specification (3.7.7.1) contains Surveillance Requirements for the Unit 1 CREVS subsystem (under Section 4.7.7.1.1) and the Unit 2 CREVS subsystem(s) (under Section 4.7.7.1.2) which are being relied upon to meet the Unit 1 LCO which requires two of the three subsystems to be operable. Unit 1 Surveillance Requirement 4.7.7.1.2.d.2 is applicable to only the Unit 2 CREVS subsystem(s) being relied upon to meet the Unit 1 LCO. Unit 1 Surveillance Requirement 4.7.7.1.1.d.2 provides the corresponding requirement for the Unit 1 CREVS subsystem being relied upon to meet the LCO. Thus, two of the three subsystems required to be operable to meet the LCO are tested by either Surveillance Requirement 4.7.7.1.1.d.2 or 4.7.7.1.2.d.2. With this Surveillance Requirement structure the Unit 1 Technical Specification requires testing of the Unit 2 subsystem(s) being relied upon to meet the Unit 1 LCO. This Surveillance Requirement structure is necessary for Unit 1, because Unit 1 can take credit for either one or both of the Unit 2 subsystems. The Surveillance Requirement structure is not necessary for Unit 2, since Unit 2 can not take credit for the Unit 1 CREVS subsystem. The Unit 2 fans credited for compliance are required to achieve the performance specified in Surveillance Requirement 4.7.7.1.2.d.4. Whereas, Unit 1 Surveillance Requirement 4.7.7.1.1.d.3 ensures that the Unit 1 fan (if credited) is capable of maintaining positive pressure.