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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 Requests for Additional Information Regarding Technical Specification Radiation Monitor Setpoint Changes (TAC Nos. M94026, M94027 and M94953)

The purpose of this letter is to provide responses to the NRC requests for additional information in support of the ongoing review of proposed changes to technical specification radiation monitors. Two separate requests for changes to the technical specifications have been submitted. Proposed operating license change request Nos. 228 and 102, for Beaver Valley Units 1 and 2, respectively, were submitted on November 6, 1995. Proposed operating license change request No. 103 for Beaver Valley Unit 2 was submitted on March 11, 1996.

On April 3, 1997, the NRC requested additional information related to the first submittal. All four questions in this request related to the Unit No. 1 radiation monitor proposed setpoint changes. Enclosure 1 contains these questions and the responses for NRC review.

On April 30, 1997, the NRC requested additional information related to the second submittal. All three questions in this request related to the Unit No. 2 radiation monitor proposed setpoint changes. Enclosure 2 contains these questions and the responses for NRC review.

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This combined response is provided in accordance with our letter of May 9, 1997. If there are additional questions regarding this letter, please contact Mr. J. Arias, Director, Safety and Licensing Department at (412) 393-5203.

Sincerely,

Sushil C. Jain

Enclosures

c: Mr. D. M. Kern, Sr. Resident Inspector
Mr. H. J. Miller, NRC Region I Administrator
Mr. D. S. Brinkman, Sr. Project Manager

ENCLOSURE 1

Response to NRC Request for Additional Information dated April 3, 1997

ENCLOSURE 1

BVPS UNIT 1: Response to NRC Request for Additional Information dated April 3, 1997

Question 1:

Provide the proposed high alarm setpoints for the following monitors:

A. Noble Gas Monitors
   1. RM-VS-109 Ventilation Vent
   2. RM-VS-110 Supplementary Leak Collection and Release System
   3. RM-GW-109 Process Vent

B. In-containment High Range Area Monitors
   1. RM-RM-219A
   2. RM-RM-219B

Responses:

This information was provided in the November 6, 1995, proposed operating license change request. This response confirms those values.

Monitor Channel	HIGH Alarm (above bkgnd)
RM-VS-109	6.69E+2 cpm
RM-VS-110	7.98E+2 cpm
RM-GW-109	1.83E+5 cpm
RM-RM-219 A/B	15,000 R/hr

Question 2:

How would the proposed increase in the alarm setpoints of the noble gas monitors impact compliance with Appendix I of 10 CFR Part 50 for individual members of the public?

Response:

There is no impact on compliance with Appendix I of 10 CFR Part 50. Appendix I addresses radioactivity releases during normal operations and expected operational occurrences, but not accidents. Accident releases are addressed under 10 CFR Part 100.

The accident monitoring channels addressed by this change were installed to meet NUREG-0737. Regulatory Guide 1.97 classifies these as Type E variables and identifies the purpose of these accident monitors to be: detection of significant releases; release assessment; long-term surveillance; and emergency plan activation. The current setpoints in the technical specifications were implemented pursuant to NUREG-0737 by license amendment 59.

The radiation monitor channels used for showing compliance with Appendix I of 10 CFR Part 50 are addressed in the BVPS Offsite Dose Calculation Manual (ODCM) Control 3.3.3.10. BVPS Technical Specification 6.8.6 discusses the ODCM with respect to radiological effluent controls. These radiation monitor channels are separate and distinct from the accident monitoring channels addressed by this change. The RM-RM-219A/B channels are in-containment area monitors. The ventilation exhaust from the containment (in operating modes 5 and 6) is monitored by radiation monitor channels identified in ODCM Control 3.3.3.10.

Question 3:

How would the proposed increase in the alarm setpoints of the above radiation monitors impact compliance with 10 CFR Part 20 for occupationally exposed individuals?

Response:

There is no impact on compliance with 10 CFR Part 20 for occupationally exposed individuals. Compliance with the 10 CFR Part 20 occupational exposure standards is achieved through a program of exposure control measures, including area posting, periodic surveys, personnel dosimetry, radiological work permit controls, and installed area and process radiation monitors.

The accident monitoring channels addressed by this change were installed to meet NUREG-0737. Regulatory Guide 1.97 classifies these as Type E variables and identifies the purpose of these accident monitors to be: detection of significant releases; release assessment; long-term surveillance; and emergency plan activation.

The RM-VS-109, RM-VS-110, and RM-GW-109 monitor channels are noble gas accident monitors that measure radioactive effluents. There are numerous area radiation monitors and ventilation process monitors described in the Updated Final Safety Analysis Report (UFSAR) that have ranges and setpoints compatible with occupational exposure control. These other channels are not affected by this change.

The RM-RM-219 monitors are accident monitors with a range of 1 - 10E7 R/hr. There are other area radiation monitor channels associated with the containment (e.g., RM-RM-201, -202, -203, -204) that have ranges and setpoints compatible with occupational exposure control. These other channels are not affected by this change.

Pursuant to NUREG-0578, dose estimates for occupancy of post-accident control stations, including those adjacent to the containment were performed. These calculations were based on a design envelope of 100% core inventory noble gases, 50% iodine, and 1% other, as specified by NUREG-0578 and NUREG-0737. The RM-RM-219 HIGH alarm setpoints are

based on 20% clad failure and the release to containment of 2% of the core inventory of noble gases and iodine. Thus, the alarm will occur for core inventory releases less than that assumed in these dose estimates.

Question 4:

Using the proposed radiation monitor alarm setpoints, provide the highest projected dose rate at the site boundary which would result from an accidental release.

Response:

The monitors addressed by this change do not perform any automatic plant functions. While operators are expected to respond to alarms on these channels to confirm, quantify, and (where possible) isolate radioactivity releases, no such manual operator action is credited in any design basis accident analysis. Thus, the act of changing the alarm setpoint does not impact any previously postulated dose at the site boundary. It is also significant to note that, while the setpoints on these accident monitors have been increased, there has been no change in the setpoints for the separate Appendix I effluent monitors. Alarm response procedures for these latter monitors also initiate operator action. Dose assessments using actual meteorology are performed in accordance with the BVPS Emergency Preparedness Plan (EPP) whenever any effluent monitor channel indicates releases exceeding ODCM Controls.

The license amendment request described how the setpoints for the noble gas effluent monitor channels were re-calculated, in part, to be consistent with the approved BVPS-1 emergency preparedness Emergency Action Levels (EALs). The basis of the EALs and the proposed high setpoints are described as:

> The dose levels at the site boundary, due to the release, will be 1000 mrem TEDE and 5000 mrem from inhalation of iodine to the child thyroid (i.e., a General Emergency).

Assumptions used in the setpoint calculations included: (1) ODCM/UFSAR specified release flow rates; (2) ICRP-30 thyroid Dose Conversion Factors (DCFs); (3) most restrictive sector annual average X/Q values from ODCM (RM-VS-109: 1.03E-4 sec/m^3; RM-VS-110: 9.24E-5 sec/m^3; RM-GW-109: 2.31E-6 sec/m^3); (4) source terms (multiple accidents) developed from the UFSAR for EPP purposes; and (5) a one hour release duration. These assumptions are consistent with the bases of the BVPS approved EALs and the bases of the NRC-endorsed NUMARC/NESP-007 EAL document. Thus, the maximum dose rates at the site boundary, consistent with the purpose for which these setpoints are being used, are the doses specified in the basis above divided by one hour.

The annual average X/Q values are used in this calculation rather than short-term accident X/Qs appropriate for DBA analyses. Therefore, these dose rates are not the highest dose rates possible, but are the highest dose rates applicable to the intended purpose of the monitor and the alarm setpoint. This is consistent with the development of the EALs.

With regard to the RM-RM-219 monitors, these in-containment radiation monitors do not provide direct indication of effluent release rate or offsite dose. The basis of the proposed setpoints for these monitors is to indicate an instantaneous release to the containment atmosphere as discussed in response to question 3. This basis is consistent with the BVPS EAL and the bases of the NRC-approved NUMARC/NESP-007 EAL document. This reading, if reached or exceeded, will conservatively be taken as indicating the failure of all three fission product barriers. This results in a General Emergency classification including a protective action recommendation of a minimum 0-2 mile plus 5 mile downwind wedge evacuation. In comparison, the DBA LOCA analysis documented in the Unit 1 UFSAR postulates a site boundary dose of about 250 rem thyroid, 5 rem whole body based on 100% core inventory noble gases, 50% core inventory iodine.

ENCLOSURE 2

Response to NRC Request for Additional Information dated April 30, 1997

ENCLOSURE 2

BVPS UNIT 2: Response to NRC Request for Additional Information dated April 30, 1997

Question 1:

How would the proposed increase in the alarm setpoints of the containment purge monitors impact compliance with 10 CFR Part 20 for individual members of the public? (Refer to specific reference to 40 CFR Part 190 in 10 CFR Part 20.)

Response:

Compliance with 10 CFR 20, 40 CFR 190, and 10 CFR 50.36a with regard to radiation exposure of the public are addressed by the BVPS Offsite Dose Calculation Manual (ODCM) and the ODCM Controls that replaced the Radiological Effluent Technical Specifications. Please refer to the BVPS Technical Specification 6.8.6 and the following BVPS ODCM Issue 3 Revision 1 pages: xix-xxii, 4-1, and D-8. There is no impact on compliance with Appendix I of 10 CFR Part 50, 10 CFR Part 20, or 40 CFR 190, as this is demonstrated by compliance with the BVPS ODCM, which is not affected by the proposed change.

The containment purge exhaust process monitors, 2HVR-RQ104 A & B, are used during refueling operations. There are effluent radiation monitors downstream of 2HVR-RQ104 A & B used for showing compliance with the ODCM and regulations addressed by the ODCM. These latter radiation monitor channels are addressed in the BVPS ODCM, Control 3.3.3.10. These channels are separate and distinct from the channels addressed by this change.

Question 3:

How would the proposed increase in the alarm setpoints of the affected radiation monitors impact compliance with 10 CFR Part 20 for occupationally exposed individuals?

Response:

There is no impact on compliance with 10 CFR Part 20 for occupationally exposed individuals. Compliance with the 10 CFR Part 20 occupational exposure standards is achieved through a program of exposure control measures, including area posting, periodic surveys, personnel dosimetry, radiological work permit controls, and installed area and process radiation monitors.

The 2HVR-RQ104 A & B channels are the containment purge exhaust process monitors, used during refueling. The HIGH alarm setpoint is based on 30% of the site ODCM limit. The ALERT alarm setpoint on the same channels is based on measuring air at 20 DAC (i.e., 1% of annual limit). Thus, sufficiently early indication of elevated in-containment airborne levels is available to initiate any necessary personnel evacuations.

The 2RMR-RQ-206 & 207 monitors are accident monitors with a range of 1 - 10E7 R/hr. These accident monitoring channels were installed to meet NUREG-0737. Regulatory Guide 1.97 classifies these as Type E variables and identifies the purpose of these accident monitors to be: detection of significant releases; release assessment; long-term surveillance; and emergency plan activation. There are other area radiation monitor channels associated with the containment (e.g., 2RMR-RQ201 -203, -204) that have ranges and setpoints compatible with occupational exposure control. These other channels are not affected by this change.

Pursuant to NUREG-0578, dose estimates for occupancy of post-accident control stations, including those adjacent to the containment were performed. These calculations were based on a design envelope of 100% core inventory noble gases, 50% iodine, and 1% other, as specified by NUREG-0578 and NUREG-0737. The 2RMR-RQ-206 & 207 HIGH alarm setpoints are based on 20% clad failure and the release to containment of 2% of the core inventory of noble gases and iodine. Thus, the alarm will occur for core inventory releases less than that assumed in these dose estimates.

Question 4:

Using the proposed radiation monitor alarm setpoints, provide the highest projected dose rate at the site boundary which would result from an accidental release.

Response:

Monitor channels 2HVR-RQ104 A & B do perform automatic protective functions (i.e., containment isolation) intended to mitigate the consequences of a design basis fuel handling accident (FHA) inside containment. As discussed in the amendment request, an analysis of a FHA inside containment, conservatively assuming no containment isolation, was performed for the EAB, LPZ and control room. This analysis yielded the following offsite doses:

	This Analysis, rem			Regulatory Criteria, rem		
	Thyroid	**Photon**	**Beta**	**Thyroid**	**Photon**	**Beta**
EAB 0-2 hr	22.4	1.79	5.07	75.0	6.0	6.0
LPZ (30 day)	2.64	0.21	0.60	75.0	6.0	6.0

The offsite dose results are a small fraction (25%) of the 10 CFR Part 100 dose guidelines and are therefore acceptable. The Unit 2 UFSAR does not currently address dose calculations for a FHA in containment stating that isolation would occur before any leakage. The UFSAR will be updated to reflect this new analysis.

Key analysis assumptions were taken from Table 15.7-6 of the UFSAR, except as modified below:

- Activity release = gap activity from 2.34 assemblies
- Duration of release = 30 days (no containment (CNMT) isolation)
- Breathing rate = 3.47E-4 m^3/sec
- Offsite X/Q = UFSAR Table 15.0-11
- Control room X/Q = UFSAR Table 15.0-14
- Control room isolation = none assumed
- Control room intake/exhaust = 500 cfm
- CNMT ventilation rate = 7500 cfm (T/S 3/4.3.9.4)
- CNMT volume = 1.8E6 ft^3
- RG 1.4 dose conversion factors

The proposed setpoints are based on 30% of the site ODCM limit of 500 mrem per year whole body. Thus, isolation of the purge exhaust will occur, even though it was conservatively not credited in the above analysis. Operability of isolation function is provided for in TS 3/4.3.9.9

With regard to the 2RMR-RQ-206 & 207 monitors, these in-containment radiation monitors do not provide direct indication of effluent release rate or offsite dose. It is important to recognize that these monitors do not perform any automatic function. While operators are expected to respond to alarms on these channels to confirm, quantify, and (where possible) isolate radioactivity releases, such manual operator action is not credited in any design basis accident analysis. Thus, the act of changing the alarm setpoint does not impact any previously postulated dose at the site boundary. The basis of the proposed setpoints for these monitors is to indicate an instantaneous release to the containment atmosphere as discussed in response to question 3. This basis is consistent with the BVPS EAL and the bases of the NRC-approved NUMARC/NESP-007 EAL document. This reading, if reached or exceeded, will conservatively be taken as indicating the failure of all three fission product barriers. This results in a General Emergency classification including a protective action recommendation of a minimum 0-2 mile plus 5 mile downwind wedge evacuation. In comparison, the DBA LOCA analysis documented in the Unit 2 UFSAR postulates a site boundary dose of about 270 rem thyroid, 5.3 rem whole body based on 100% core damage.