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January 25, 1988

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Reference: Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, License No. DPR-66
Additional Information - TAC Item 65106
(1) Letter from J. D. Sieber, DLC to USNRC, dated April 13, 1987
(2) Letter from J. D. Sieber, DLC to USNRC, dated December 2, 1987

Gentlemen:

This letter provides our response to your request for additional information (Telecopy dated January 5, 1988) regarding our request for Technical Specification Change No. 136. The item identified in your telecopied request is reiterated here followed by our response:

1. In proposed TS 4.11.2.5.1 (Ref. 1) it is stated that:

   "The quantity of radioactive material contained in each gas storage tank shall be determined to be within the above limit at least once per 24 hours when radioactive materials are being added to the tank. Performance of this surveillance is required when the gross concentration of the primary coolant is >100 μCi/ml."

   In Ref. 2 (Item 4(c)), Duquesne Light provided information regarding the basis for the value of 100 microcuries/ml. However, Ref. 2 did not explain the link between the estimated concentrations of gases in the WGDTs (i.e., 361 microcuries/cc for Beaver Valley Unit-1) and the gross concentration in the primary coolant. Provide an analysis that shows that when the gross concentration of radionuclides in the primary coolant is less than or equal to 100 microcuries/ml, then

   (a) The quantities of radioactive gases in each tank is less than or equal to 52,000 Ci of noble gases (i.e., TS 3.11.2.5); and

   (b) In the event of an uncontrolled release of the tanks' contents, the resulting total body exposure to an individual located at the nearest exclusion boundary for two hours immediately following the onset of the release will not exceed 0.5 rem (see Bases 3/4.11.2.5, page B 3/4 11-5).

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Response

All of the calculational methodology used for Technical Specification Change Request No. 136 was performed using existing analyses from the Unit 1 Updated FSAR and applying the more recent Unit 2 FSAR analyses to Unit 1.

The following iterations are derived from the Unit 1 Updated FSAR, the Unit 2 FSAR and Calculation Package ERS-ATL-86-025 (RM-GW-101 Technical Specification Change Justification).

Offsite Doses (Accidental Release of Waste Gas)

1. **Using Unit 1 Updated FSAR analyses:**

   Section 14.2.3 of the Unit 1 Updated FSAR (Accidental Release of Waste Gas) shows that a rupture of the Unit 1 gas surge tank can produce a maximum offsite dose of 0.10 rem whole body. Since the Unit 1 gaseous waste decay tank volume (132 cubic feet) is larger than the Unit 1 gas surge tank volume (52 cubic feet) by a factor of 2.54, then an accidental release of a Unit 1 gaseous waste decay tank would produce a maximum offsite dose of 0.254 rem whole body. This value is less than the 0.5 rem value referenced in Section 3/4 11.2.5 of the Technical Specification Bases. This analysis also shows compliance with 10 CFR 100.11 criteria (ie; an individual located at the nearest exclusion area boundary for two hours immediately following the onset of a release would not receive a total dose to the whole body in excess of 25 rem).

2. **Applying Unit 2 FSAR analyses to Unit 1:**

   Section 15.7.1 of the Unit 2 FSAR (Waste Gas System Failure) shows that a rupture of the Unit 2 gaseous waste storage tanks can produce a maximum offsite dose of 0.16 rem whole body. Please note that this dose also shows compliance with Section 3/4 11.2.5 of the Technical Specification Bases and 10 CFR 100.11.

Reactor Coolant Concentrations vs Decay Tank Concentrations

1. **Using Unit 1 Updated FSAR analyses:**

   Section 14.2.3 of the Unit 1 Updated FSAR indicates that Reactor coolant fission product concentrations are based on the assumption that 1.0 percent of the fuel rods in the core develop pinhole defects, resulting in the diffusion of fission product isotopes into the coolant. The rod fission product inventories are those produced at 100 percent power at a maximum calculated core thermal rating of 2,766 MWt. The greatest expected buildup of radioactive fission isotopes in the gas surge tank is approximately 1,780 Ci (FSAR Table 14B-10).

   Since the Unit 1 gaseous waste decay tank volume is larger than the Unit 1 gas surge tank volume by a factor of 2.54, then the greatest expected buildup in a Unit 1 gaseous waste decay tank would be 4,518 Ci.

Table 14B-6 of the Unit 1 Updated FSAR shows Reactor Coolant Equilibrium Fission and Corrosion Product Activities when using the above parameters. When all of the concentrations listed in the table are summed, the resultant gross RCS concentration (excluding tritium) is ≈ 51 uCi/ml. This RCS concentration relates to a gaseous waste decay tank concentration of 218 uCi/cc (corrected to 14.3 PSIA) when there is 4,518 Ci in a gaseous waste decay tank.

2. Applying Unit 2 FSAR analyses to Unit 1

Section 15.7.1 of the Unit 2 FSAR indicates that the parameters used for determination of reactor coolant fission product concentrations are similar to the parameters used in the Unit 1 analysis as described above. A gaseous waste storage tank can release 20,508 Ci (FSAR Table 15.7-3). However, Unit 2 FSAR Table 11.3-3 lists a more restrictive design value of 22,400 Ci/yr for the Unit 1 radioactive gaseous waste system. This more restrictive activity was used for determination of the gaseous waste decay tank concentration.

The total activity of 22,400 Ci/yr is considered to be spread evenly in each Unit 1 gaseous waste decay tank, therefore the greatest expected buildup of radioactive fission isotopes in a Unit 1 gaseous waste decay tank would be 7,470 Ci (ie; 22,400 Ci ÷ 3).

Table 11.1-2 of the Unit 2 FSAR shows Reactor Coolant equilibrium Fission and corrosion Product Activities when using the above parameters. When all of the concentrations listed in the table are summed, the resultant gross RCS concentration (excluding tritium) is ≈ 75 uCi/ml. This RCS concentration relates to a gaseous waste decay tank concentration of 361 uCi/cc (corrected to 14.3 PSIA) when there is 7,470 Ci in a gaseous waste decay tank.

Compliance With Unit 1 Technical Specification 3.11.2.5

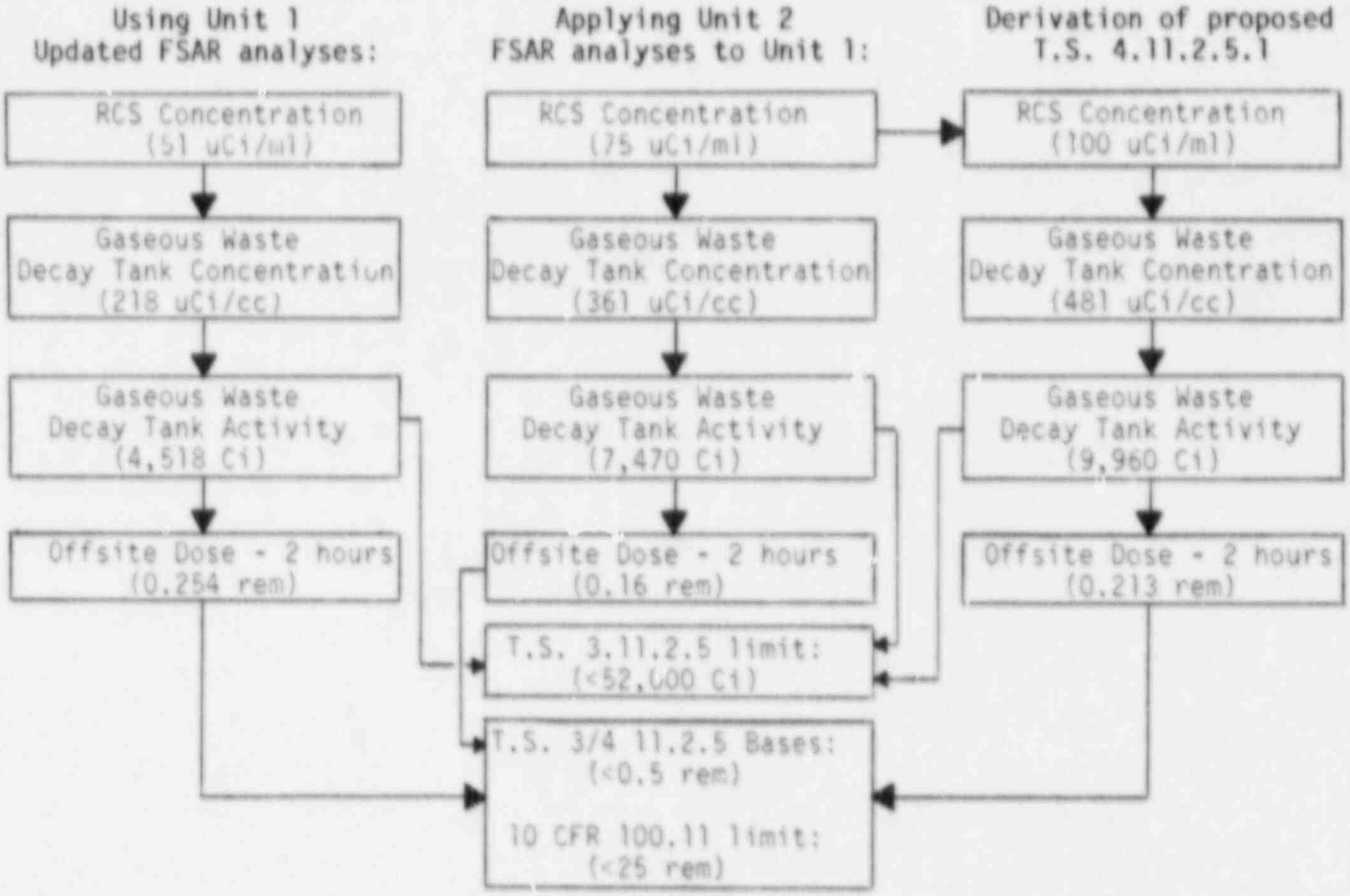
1. Using Unit 1 Updated FSAR analyses:

As calculated above (from Unit 1 Updated FSAR Section 14.2.3), the greatest expected buildup in a Unit 1 gaseous waste decay tank is 4,518 Ci. This value shows compliance with the 52,000 Ci limit from Unit 1 T.S. 3.11.2.5.

2. Applying Unit 2 FSAR analyses to Unit 1:

As calculated above (from Unit 2 FSAR Section 15.7.1), the greatest expected buildup in a Unit 1 gaseous waste decay tank would be 7,470 Ci. This value also shows compliance with the 52,000 Ci limit from Unit 1 T.S. 3.11.2.5.

The following table shows a numerical flowpath (from RCS concentration to offsite dose) when an accidental release of a gaseous waste decay tank occurs at Unit 1.



In summary, DLC derived the 100 uCi/ml RCS concentration (as proposed in T.S. 4.11.2.5.1) by applying the Unit 2 FSAR analyses to Unit 1. This was done because the Unit 2 FSAR yields more restrictive values (ie; RCS concentration, gaseous waste decay tank concentration and gaseous waste decay tank activity) than the Unit 1 Updated FSAR. The Unit 2 FSAR does yield a lower relative offsite dose than the Unit 1 Updated FSAR, but that is due to more recent conditions (eg; computer codes, dispersion parameters and deposition parameters).

Based on the above response, this letter provides additional documentation to further enhance the results of the calculation package sent previously (Ref 2). Therefore, it is requested that NRC re-evaluate our previous submittal and approve the proposed Technical Specification changes.

Very truly yours,

J. D. Sieber
Vice President,
Nuclear

ATL:mb

cc: Mr. F. I. Young, Sr. Resident Inspector (Unit 1)
Mr. J. Beall, Sr. Resident Inspector (Unit 2)
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