

SOUTH CAROLINA ELECTRIC & GAS COMPANY

POST OFFICE BOX 764

COLUMBIA, S. C. 29218

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Mr. Thyagaraja Chandrasekran
Office of Nuclear Reactor Regulation
U. S. NRC
Washington, DC 20555

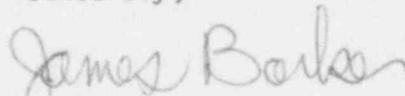
Dear Chandra:

Attached is my suggested rewording of the settling pond tech spec and its basis.

My changes basically keep the unit of activity as the microcurie rather than introduce the picocurie and acknowledge the fact that the density of the drained slurry is about 1 gm/ml. The implication is that for the purpose of fulfilling the tech-spec requirement on applicant need only count wet drained slurry in a standard for him liquid counting configuration and use his standard analysis programs.

I think these changes are in agreement with the discussion I had with Jack Bagley. If there are any problems, please contact me.

Sincerely,



James Barker, PhD
Staff Health Physicist

JB:tdh

Attachment

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A PDR

RADIOACTIVE EFFLUENTS

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BASES

3/4.11.1.3 LIQUID WASTE TREATMENT

The OPERABILITY of the liquid radwaste treatment system ensures that this system will be available for use whenever liquid effluents require treatment prior to release to the environment. The requirement that the appropriate portions of this system be used when specified provides assurance that the releases of radioactive materials in liquid effluents will be kept "as low as is reasonably achievable." This specification implements the requirements of 10 CFR Part 50.36a, General Design Criterion 60 of Appendix A to 10 CFR Part 50 and the design objective given in Section II.D of Appendix I to 10 CFR Part 50. The specified limits governing the use of appropriate portions of the liquid radwaste treatment system were specified as a suitable fraction of the dose design objectives set forth in Section II.A of Appendix I, 10 CFR Part 50, for liquid effluents.

3/4.11.1.4 LIQUID HOLDUP TANKS

Restricting the quantity of radioactive material contained in the specified tanks provides assurance that in the event of an uncontrolled release of the tanks' contents, the resulting concentrations would be less than the limits of 10 CFR Part 20, Appendix B, Table II, Column 2, at the nearest potable water supply and the nearest surface water supply in an unrestricted area.

3/4.11.1.5 SETTLING PONDS

Inventory limits of the settling ponds (SP) are based on limiting the consequences of an uncontrolled release of the pond inventory. The expression in Specification 3.11.1.5 assumes the pond inventory is uniformly mixed, that the pond is located in an uncontrolled area as defined in 10 CFR 20, and that the concentration limit in Note 1 to Appendix B of 10 CFR 20 applies.

The batch limits of slurry to the chemical treatment ponds assure that radioactive material in the slurry transferred to the SP are "as low as is reasonably achievable" in accordance with 10 CFR 50.36a. The expression in Specification 4.11.1.5 assures no batch of slurry will be transferred to the SP unless the sum of the ratios of the activity of the radionuclides to their respective concentration limitation is less than the ratio of the 10 CFR 50, Appendix I, Section II.A, total body level to the 10 CFR 20, 105(a), whole body dose limitation, or that:

$$\sum_j \frac{C_j}{C_j} < \frac{3 \text{ mrem/yr}}{500 \text{ mrem/yr}} = 0.006$$

where

C_j = radioactive slurry concentration for radionuclide "j" entering the unrestricted area SP, in microcuries/milliliter

BASES

3/4 11.1.5 SETTLING PONDS (Continued)

C_j = 10 CFR 20, Appendix B, Table II, Column 2, concentration for single radionuclide "j", in microcuries/milliliter.

For the design of filter/demineralizers using powder resin, the slurry wash volume and the weight of resin used per batch is fixed by the cell surface area and the slurry volume to resin weight ratio is constant at 100 milliliters/gram of wet, drained resin with a moisture content of approximately 55 to 60% (bulk density of about 58 pounds per cubic feet). Therefore,

$$\sum_j \frac{C_j}{C_j} = \sum_j \frac{Q_j}{C_j (10^2 \text{ ml/gm}) (10^6 \text{ pCi/}\mu\text{Ci})} < 0.006, \text{ and}$$

$$\sum_j \frac{Q_j}{C_j} < 6 \frac{\mu\text{Ci/gm}}{\mu\text{Ci/ml}}$$

Where the terms are defined in Specification 4.11.1.5.

Insert

Since for wet drained slurry the density is approximately 1 gm/ml and the absorption characteristics for γ -radiation is essentially that of water, one can further rewrite this as

$$\sum_j \frac{Q_j}{C_j} < 6$$

the individual will be sufficiently low... atmospheric diffusion factor above that for the site boundary. release rate limits restrict, at all times, the corresponding gamma and beta dose rates above background to an individual at or beyond the site boundary to less than or equal to 500 mrem/year to the total body or to less than or equal to 3000 mrem/year to the skin. These release rate limits also restrict, at all times, the corresponding thyroid dose rate above background to an infant via the cow-milk-infant pathway to less than or equal to 1500 mrem/year for the nearest cow to the plant.

RADIOACTIVE EFFLUENTS

SETTLING POND

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LIMITING CONDITION FOR OPERATION

3.11.1.5 The quantity of radioactive material contained in each settling pond shall be limited by the following expression:

$$\frac{264}{V} \cdot \sum_j \frac{A_j}{C_j} < 1.0$$

excluding tritium and dissolved or entrained noble gases, where,

A_j = Pond inventory limit for single radionuclide "j", in curie.

C_j = 10 CFR 20, Appendix B, Table II, column 2, concentration for single radionuclide "j", microcuries/ml.

V = design volume of liquid and slurry in the pond, in gallons.

264 = Conversion unit, microcuries/curie per milliliter/gallon.

APPLICABILITY: At all times.

ACTION:

- a. With the quantity of radioactive material in the settling pond exceeding the above limit, immediately suspend all additions of radioactive material to the pond and within 48 hours reduce the pond contents to within the limit.
- b. The provisions of specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.11.1.5 The quantity of radioactive material contained in each batch of slurry (used powdex resin) to be transferred to the settling ponds shall be determined to be within the above limit by analyzing a representative sample of the slurry, and batches to be transferred to the settling ponds shall be limited by the expression:

$$\sum \frac{Q_j}{C_j} < 5.0 \times 10^5 \frac{\text{pCi/cm}^3}{\text{pCi/ml}} < 0.6$$

RADIOACTIVE EFFLUENTS

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SURVEILLANCE REQUIREMENTS (Continued)

where

Q_j = concentration of radioactive materials in wet, drained slurry (used powdex resin) for radionuclide "j" excluding tritium, dissolved or entrained noble gas and radionuclides with ~~greater~~ than 8 day half-life. The analysis shall include at least Ce-144, Cs-134, Cs-137, Sr-89, Sr-90, Co-58 and Co-60 in ~~picocuries/gram~~ *microcuries/milliliter* *Microcuries/gm or*

C_j = 10 CFR 20, Appendix B, Table II column 2 concentration for single radionuclide "j", in microcuries/milliliter.

{ Estimates of Sr-89, Sr90 batch concentrations shall be included, based on the most recently available monthly composite analysis.