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VARGA,S.A. Operating Reactors Branch 1

SUBJECT: Forwards response to 840926 request for addl info re offsite dose calculation manual review.

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FLORIDA POWER & LIGHT COMPANY

October 22, 1984
L-84-292

Office of Nuclear Reactor Regulation
Attention: Mr. S. A. Varga, Chief
Operating Reactors Branch #1
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Varga:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Off-Site Dose Calculation Manual Review

Florida Power and Light has reviewed the NRC letter dated September 26, 1984 which requested additional information on the Off-Site Dose Calculation Manual for Turkey Point Units 3 and 4.

The requested information is attached.

Should you or your staff have any questions on this information, please contact us.

Very truly yours,

J. W. Williams, Jr.
Group Vice President
Nuclear Energy

JWW/PLP/js

Attachment

cc: J. P. O'Reilly, Region II
Harold F. Reis, Esquire
PNS-LI-84-376-1

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Proposed resolutions to the errors and inconsistencies identified during the review of the Offsite Dose Calculation Manual (ODCM) for Turkey Point Plant Units 3 and 4.

Question #1 - The units for A_i on page 6 are correct as mrem/Ci · min/gal, however, the units for the liquid discharge tables in Appendix A should all be given as mrem dose based on a 1 Ci/yr release in a discharge flow of 1 gpm. This heading is given on Table 2 and 3 of the liquid discharge tables but was inadvertently omitted from Table 1.

Question #2 - We propose to give separate definitions for the terms "S", "A", and "g". The definitions will be identical except that the word "continuous" will be substituted for "batch" in the definitions dealing with a continuous release.

Question #3 In our Technical Specification submittal we failed to take credit for the fact that Turkey Point is a two-unit site. Therefore, we propose to change our Technical Specification Section 3.9.1.d to reflect the limits for a dual unit site. Based on your concurrence of this proposed action, we will submit a change to our Technical Specifications and subsequently modify the ODCM.

Question #4 - We agree that Table 3-2 should be referenced and not Table 3-1. We also discovered that the tables were incorrectly identified in the table listing on page "ii" of the ODCM.

Question #5 - We feel that the need for Equations 12 and 13 would be more apparent if two of the paragraphs in the text of the ODCM were moved to a new location and an extra sentence of explanation was added. We propose moving the first two paragraphs on Page 13 to a location just before section 3.3.1, and an extra sentence of explanation would be added to paragraph 1. The text would appear as follows:

Compliance with the limits on dose rate from noble gases is demonstrated by establishing gaseous effluent monitor alarm setpoints such that an alarm will occur at or before a dose rate limit for noble gases is reached. If an alarm occurs when the monitor setpoint is at or below its limit, compliance may be assessed by comparing the monitor record with the setpoint (limit) calculated in accordance with section 3.6 or a more conservative method. In the event an alarm occurs and the monitored release exceeds the setpoint limit, then compliance may be evaluated by calculating dose rates in accordance with Sections 3.3.1 and 3.3.2.

Since Xe-133 has comprised most of the effluent noble gas radioactivity historically, alarm setpoints may be derived on the basis of Xe-133, an historical spectrum dominated by Xe-133, or on a measured spectrum. As long as Xe-133 is the dominant radioactive gas in airborne effluent, the gamma dose rate to a person's body is expected to be a larger fraction of the limit, 500 mrem/year, than is the beta plus gamma dose rate to skin, 3000 mrem/yr. In that case, a gaseous effluent monitor setpoint may be derived on the basis of gamma dose rate to a person's body alone; such that an alarm occurs at or before the total body dose rate offsite exceeds 500 mrem/year as given in Specification 3.9.2.a.

Question #6 - We agree that the 0.5 factor should not be here. We propose to remove it from the equation and from the definitions below the equation.

Question #7 - We agree that the reference to Appendix A is incorrect. The correct reference is Table 3-6.

Question #8 - We propose to remove Fe-55 which was inadvertently included in this statement.

Question #9 - We agree that the correct maximum averaging time for "other radionuclides" should be 9 days and not 35 days.

Question #10 - We propose to change slightly the definition of Q_j to "The measured gaseous radioactivity released via a stack or vent during a single counting interval j (μCi)"

Question #11 - Q_{ik} is intended to be the sum of the I-131 and I-133 activity based on a single analysis k; we propose to change the definition of Q_{ik} to "The quantity of radionuclide i (I-131 and I-133) released in a given effluent stream based on a single analysis k (μCi)"

Question #12 - Based on historical annual averaged X_d/Q and X/Q values, the nearest garden is subject to more exposure than is any residence. Therefore, the residence was assumed at the location of the garden, resulting in a conservative choice for assessing dose to a person from iodine and particulates in airborne releases.

Question #13 - See answer for Question #4.

Question #14 - See answer for Question #4.

Question #15 - The wording in the final paragraph of page 23 was incorrect and should not have used the word "computed" in describing the gas distribution. We propose to change the paragraph to read "In the event the distribution of radioactive noble gases is based on a historically measured distribution appearing in Table 3-2 or on Xe-133 alone, the MPC for the noble gas is 3×10^{-7} μCi/cm^3."

Question #16 - Equation 29 (Page 29 of the ODCM) includes Beta and Gamma irradiation from airborne radioactive noble gas. Because Section 4.3.2 will be used to assess the dose to the most exposed member of the public, irradiation directly from radioactive material within the Turkey Point Plant is not expected to contribute measurably or significantly to the dose to the most exposed member of the public because he resides more than 3.5 miles from the plant.

Question #17 - A general explanation of how the Appendix A pathway-dose transfer factors were developed is included in the paragraph at the beginning of Appendix A. In the computation, a unit release, 1 Ci/yr, of the radionuclides, and unit dilution or dispersion, as appropriate, for an aqueous or airborne release was assumed. Thus, the dose transfer factors are expressed in dose equivalent or dose equivalent commitment (mrem) per unit release and per unit dilution or dispersion.

Question #18 - We would consider revising these values if and when a major change was made to our waste processing systems. At present, we are still using demineralizers for processing liquid waste and we still have the same airborne release clean-up system as we had when the data was evaluated for A_{eff} calculations.

Question #19 - The weighted dose transfer factors for radioisotopes of noble gases released each year was calculated with the equation

$$A_{eff} = \frac{\sum_i Q_i \cdot A_i}{\sum_i Q_i}$$

where Q_i = The quantity of each radioisotope i of a noble gas released during a year, (Ci/yr)

A_i = Dose transfer factor for each radioisotope i of a noble gas via irradiation of air,

$$\frac{\text{mRad}}{\left(\frac{\mu\text{Ci} \cdot \text{sec}}{\text{m}^3}\right)}$$

The average value is the simple average of A_{eff} for the three (3) years.

Question #20 - The dose factors referenced, appear in Appendix A for the air-contaminated forage-cow-milk-infant-thyroid pathway. The derivation of the factors in Appendix A is explained in the response to Question #17.