JUL 16 1984

Docket Nos.: 50-352/353

Mr. Edward G. Bauer, Jr.
Vice President & General Counsel
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Dear Mr. Bauer:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION - LIMERICK
OFFSITE DOSE CALCULATION MANUAL

The NRC staff and its contractor, the Franklin Research Center, have completed a first round review of the Offsite Dose Calculation Manual (ODCM) which was submitted On January 19, 1984. We request that the ODCM be revised to reflect the responses to the enclosed comments and resubmitted for our review.

A. Schwencer Chief
Licensing Branch No. 2
Division of Licensing

Enclosure:
ODCM Review for Limerick

cc: See next page

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Enclosure

ODCM Review for Limerick Generating Station Units 1 and 2

Licensee: Philadelphia Electric Company
Docket Nos.: 50-352/50-353

The review comments presented in this report were prepared by the Franklin Research Center under contract to the U.S. Nuclear Regulatory Commission (Office of the Nuclear Reactor Regulations, Division of Operating Reactors) for technical assistance in support of NRC reactor licensing actions. This report is the result of reviewing the Licensee-submitted ODCM proposal (Revision 0, dated March 1983) against the NRC guidelines (Regulatory Guide 1.109 and NUREG-0133).

June 18, 1984

Franklin Research Center
A Division of The Franklin Institute

Limerick ODCM Review

Subject	Page Number	Comments
Liquid Setpoint	20	The Licensee should assign units for C_t.
	21	Provide a method to calculate setpoints for the service water monitor required by the model RETS.*
Liquid and Gaseous Setpoints	21	Provide a methodology for adjusting the monitor setpoints if simultaneous releases are made from several effluent streams, including Unit 2.*
Gaseous Setpoints	24	Methodologies should be provided for all monitors having automatic control features required by technical specification governing normal releases.. SRP 11-5 Table 1 provides for a waste gas holdup system (charcoal treatment system in Limerick design) monitor with automatic control features. Similar monitors are provided for in the SRP for containment purge and fuel storage and ventilation systems. A similar monitor is provided for in the SRP for condenser evacuation systems but only if not monitored prior to the release point by downstream provisions. No other monitors are provided for in the SRP with automatic control features. Add setpoint methodologies for monitors not so addressed in the ODCM draft, but required by the SRP. Delete methodologies for monitors not required by the SRP.*
	25	Rather than simply referencing Regulatory Guide 1.109, the Licensee should provide the whole body gamma dose factor (K_i), the beta skin dose factor (L_i), and the air dose factor (M_i) in the ODCM.
	26	The Licensee has not provided data for the inhalation dose factor P_i in the ODCM.

*These comments were provided by C. Nichols, METB, NRC, in lieu of FRC comments.

Liquid Concentration	1	For the sake of clarity, the Licensee should refer to the noble gases in the liquid waste as "the dissolved or entrained noble gases" as stated in the RETS for radioactive liquid concentrations.
	1	The Licensee should also consider the unidentified radionuclide concentration in determining the dilution factor. For those nuclides, the suggested MPC value (according to 10CFR20) is $1x10^{-7}$ uCi/ml.

Subject	Page Number	Comments
Gaseous Dose Rate	5	For the gross release method, Kr-89 has the most limiting dose factors for both total body and skin. The Licensee should explain why Kr-88 and Kr-87, instead of Kr-89, are considered as the most conservative isotopes for this calculation.
	7	The Licensee should explain how inhalation dose factors P_{I-131} and P_{I-133} are calculated.
	8	Section 2 of Appendix D to the Limerick FES states that because of the airflow around the cooling towers, the vent releases were assumed at ground level with mixing allowed for turbulence in the wake of these structures. However, for a ground-level release, the Licensee's highest calculated $(X/Q)_v$ of 6.29 x 10^{-7} sec/m^3 seems low. The Licensee should explain the possible discrepancy.
Liquid Dose	4	What is the basis for selecting only the total body and bone as the critical organ?
	27	The Licensee has not provided data for the bioaccumulation factor (BF_i) and the ingestion dose conversion factor (DF_i) in the ODCM.
	27	The Licensee should assign units for the ingestion dose conversion factor (DF_i).
Gaseous Air Dose	9	For beta radiation, the Licensee should provide data for the air dose factor (N_i) in the ODCM.
Gaseous Dose for I-131 and I-133	27	In Note 2, the Licensee has provided an equation to calculate the grass-goat milk ingestion. How does the Licensee justify that the grass-cow milk pathway, ground-plane pathway, grass-meat pathway, and vegetation pathway need not be considered?

Subject	Page Number	Comments
Gaseous Dose for I-131 and I-133	28	The Licensee has not provided the ingestion dose factor (DFL_i) for I-133.
Liquid Dose Projection	3	The Licensee has not specifically described the method for the monthly dose projection in connection with the operation of the liquid radwaste treatment system, according to the specified dose limits of RETS. In this dose projection, a method should be provided to describe how the Licensee would foresee oncoming situations and be able to predict the radioactivity releases for the next month.
Gaseous Dose Projection	11	As in the case of the monthly liquid dose projection, the Licensee should describe how the releases will be projected for the upcoming month.
Total Dose	12	The Licensee's method provided under "B" states: "Cumulative dose contribution from direct radiation = total dose at the site of interest (as evaluated by TLD measurements) - mean of background dose (as evaluated by TLD's at background sites) - effluent contribution to dose (as evaluated above)."
	12	The Licensee seems to imply that the total dose can be measured by TLD, which is not true. Instead, the Licensee should provide a method to estimate the direct radiation dose and add it to doses calculated from all other pathways.
Radiological Environmental Monitoring Program	15	1. The Licensee has not specified the control locations for all pathways. 2. The Licensee has not completed the description of the milk sampling station.

Subject	Page Number	Comments
Radiological Environmental Monitoring Program (Cont.)	15	3. One of the fish sampling stations should be downstream.
	17, 18, 19	The Licensee has not assigned a scale for each of the figures (VI.A.1, VI.A.2, and VI.A.3) shown.
Liquid and Gaseous Effluent Flow Diagrams	31, 32	The following deficiencies are found in the flow diagrams (Figures IX.A.1 and IX.A.2) provided by the Licensee: 1. The diagrams have not clearly shown the release points for both liquid and gaseous effluents. 2. Radiation monitors and controls are not explained in the diagrams. 3. For liquid effluents, the dilution flow is not designated. 4. It is not clear whether the gaseous effluent system is shared by both reactor units. 5. For gaseous effluents, the vent/stack elevations of the release points and the mode of releases should be designated. 6. Figure IX.A.2 is not legible; a simpler flow diagram is suggested.
Interlaboratory Comparison Program	--	The Licensee has not provided a description of the participation in the interlaboratory comparison program according to the RETS.

Typographic Errors

Page Number	Location	Comments
2	Second line of the the description of D	The line should read, "...any organ, τ, from liquid..."; the letter "τ" is missing.
2	Third line of the description of C_{il}	The line should read, "Δt from any liquid release,..."; the symbol Δ is missing.
2	Last line of the description of C_{il}	The sentence should end with a right parenthesis.
7	Equation for D_T	The variable "Q_{iv}" should read "$\dot{Q}_{iv}$".
9	Equation for D_γ	The equation should end with a right parenthesis.
10	Description of N_i for the Equation of D_β	The variable N_i should read "N".
20	Equation for C_t	The variable MPC should read "MPC_i".
27	Equation for $A_i\tau$	The parameter A_i should read "$A_{i\tau}$".

ADDITIONAL COMMENTS ON THE
PRPOSED OFFSITE DOSE CALCULATION MANUAL
FOR LIMERICK UNITS 1 & 2 (12/84)

Page No./Section	Subject	Comments
5/III	Gaseous Pathway Dose Calculations	1. Provide a numbered and captioned figure showing the site boundary and the unrestricted area boundary for gaseous and liquid effluents. 2. Provide the date of the land-use census that was used in identifying the controlling receptor locations. 3. Presumably the methodology described in the ODCM will be implemented via computer codes. The computer codes should be verified. After the codes are verified, provide a reference (individual or company name, title of document, and date) in the ODCM to document the validation of the codes.
27/VIII	Site Specific Data (Note 1: Second Paragraph)	1. The reference in the document to Branagan et al., is unpublished. It would be more appropriate to refer to ICRP-30 and NUREG/CR-1336 which are published.