Comments on

Oyster Creek Nuclear Station - Unit 2
Jersey Central Power and Light Company
Preliminary Safety Analysis Report
Volumes 1, 2 and 3 dated April 29, 1968

Prepared by

Air Resources Environmental Laboratory
Environmental Science Services Administration
May 27, 1968

The assumed dispersion conditions listed in Table 2-2 for the three periods following an accident are reasonably conservative as judged from the on-site meteorological data presented in the report. The relative diffusion calculations (χ/Q) are also conservative for the 0-2 and 2-24 hour periods and it is noted that the added dilution effect because of the building-induced turbulence amounted to a factor of about 3.5. For the 1-30 day period we believe there is a computational error in the χ/Q value and also, strictly speaking, the equation at the top of page 2-5 is incorrect. The distance, x, which appears in the sector-averaged equation according to Gifford [1] comes about because of an integration over the sector arc, s, where $s = x\theta$ and θ is the sector angle in radians. Thus, rather than increase x by an amount x', as was done in the equation on page 2-5, the σ_z value should be taken at a distance of (x + x') rather than x. Thus the equation should read

$$(\chi/Q)_{av} = \left(\frac{c}{x}\right)\left(\frac{n}{N}\right)\left(\frac{\overline{1}}{u}\right)\left(\frac{1}{\sigma_{z\ (at\ x+x')}}\right).$$

In practice, however, there is very little difference in the χ/Q values by the two methods. Using the equation, above, and the assumed dispersion frequencies in Table 2-2 we calculate an average 30-day χ/Q value of 1.1×10^{-5} sec/m^3 at the site boundary of 427 meters. This is about twice the value listed in Table 2-2 and would increase the thyroid doses shown in figures 14-63 and 14-64 from 9 to 20 rem and 320 to 720 rem, respectively.

References

[1] Gifford, F. A. (1960), "Atmospheric Dispersion Calculations Using Generalized Gaussian Plume Model", Nuclear Safety, 2(2), eq. (7), p. 24.

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