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June 4, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Ms. E. G. Adensam, Chief
Licensing Branch No. 4

Re: Catawba Nuclear Station
Docket Nos. 50-413 and 50-414

Dear Mr. Denton:

As stated in my May 29, 1984 letter, please find attached Section C4.3 of the Catawba Offsite Dose Calculation Manual.

Also be advised that in a future revision to the Generic Section of the ODCM, Section 3.3.5 will be changed to delete the words "...the estimates of this dose will be presented in the section on site specific information." The dose estimates referenced are already provided in Section 3.1.3.

Very truly yours,

Hal B. Tucker

Hal B. Tucker

RWO/php

Attachment

cc: Mr. James P. O'Reilly
Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30303

NRC Resident Inspector
Catawba Nuclear Station

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C4.3.2.2 Radioiodines, Particulates, and Other Radionuclides with $T\ 1/2 > 8$ days

For dose estimates, simplified dose estimates using the assumptions in C4.2.2.2 and source terms in the FSAR are presented below. Once operational source term data is available, this information shall be used to revise these calculations, if necessary. These calculations further assume that the annual average dispersion/deposition parameter is used and that 95% of the dose is from Iodine-131 concentrated in goat's milk. The simplified dose estimate to the thyroid of an infant is:

$$D = 1.84E{+}04\ w\ (\tilde{Q})_{I-131}\ (1.05)$$

where:

w = 7.3E-10 = $\overline{D/Q}$ for food and ground plane pathway, in m^{-2} from Table C4.0-2 for location of nearest real goat (NW sector at 2.5 miles).

$(\tilde{Q})_{I-131}$ = the total Iodine-131 activity released in μCi.

1.84E+04 = (3.17E-08)(R_i^C [$\overline{D/Q}$]) with the appropriate substitutions for goat's milk in the grass-cow-milk-pathway factor, R_i^C [$\overline{D/Q}$] for Iodine-131. See Section 3.1.2.2.

1.05 = factor derived from the conservative assumption (based on historical data) that 95% of the dose is contributed by I-131.

C4.3 FUEL CYCIE CALCULATIONS

As discussed in Section 3.3.5, more than one nuclear power station site may contribute to the doses to be considered in making fuel cycle dose assessments in accordance with 40CFR190. The fuel cycle dose assessments for Catawba Nuclear Station must include dose contributions from McGuire Nuclear Station, which is located upstream approximately thirty miles NNE of Catawba. For this dose assessment, the maximum exposed individual is conservatively assumed to live 5 miles NNE of Catawba and 5 miles SSW of McGuire; this individual eats fish caught in the discharge area at Catawba.

The dose contributions resulting from gaseous effluents are calculated using the methodology in Section 3.1.2:

$$D_f(g) < 0.47\ D_M(g) + 0.55\ D_C(g)$$

Where:

$D_M(g)$ = dose contribution from McGuire calculated using $\overline{X/Q}$ = 1.5E-07 sec/m³

and $\overline{D/Q}$ = 3.8E-10 sec/m³. The location is 5 miles SSW of McGuire.

0.47 = fraction of time the wind direction is out of NNE.

$D_c(g)$ = dose contribution from Catawba calculated using $\overline{X/Q} = 3.3E\text{-}07\ sec/m^3$ and $\overline{D/Q} = 3.5E\text{-}10\ sec/m^3$. The location is 5 miles NNE of Catawba.

0.55 = Fraction of time the wind direction is out of SSW.

Using the methodology above and the assumption that each station releases their maximum Technical Specification dose limit, the gaseous effluent contribution to the fuel cycle calculation is but a small fraction (< 1/100) of the allowable dose. Therefore, fuel cycle calculations will not normally be performed unless either station exceeds their gaseous effluent Technical Specifications by a factor of 10.

The dose contribution resulting from liquid effluents is calculated using the methodology in Section 3.1.1:

$$D_f(\ell) < 0.607 \cdot D_M(\ell) + D_C(\ell)$$

Where:

$$.607 = \frac{2670 \text{ cfs (average flow past Cowans Ford Dam)}}{4400 \text{ cfs (average flow past Lake Wylie Dam)}} \text{ dilution}$$

$D_m(\ell)$ = Dose contribution from McGuire via liquid effluents

$D_c(\ell)$ = Dose contribution from Catawba via liquid effluents

Using the methodology above and the assumption that each station releases its maximum Technical Specification dose limit, the liquid effluent contribution to the fuel cycle calculation would be 48% of the allowable dose. Therefore, fuel cycle calculations will not normally be preformed unless either station exceeds its liquid effluent Technical Specifications by a factor of 2.

In summary, Technical Specification 3.11.4 will be the deciding criteria for Catawba fuel cycle calculations since it is either equal to (liquid) or is more restrictive than (gaseous) the cases outlined above.