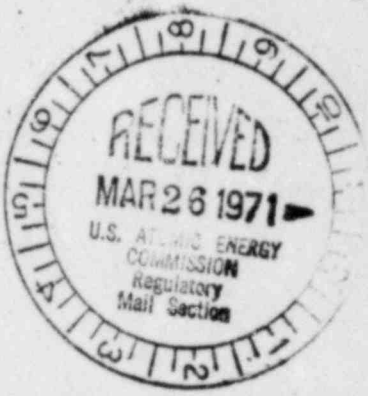
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION

July 29, 1970

Silver Spring, Maryland 20910

R323



Mr. Walter G. Belter, Chief
Environmental & Sanitary Engineering Branch
Reactor Development & Technology Division
U. S. Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. Belter:

This refers to the letter of July 29, 1970 from R.C. DeYoung, Assistant Director for Reactor Projects of the Division of Reactor Licensing requesting comments on the following:

Oconee Nuclear Stations Units 1, 2, and 3
Duke Power Company
Final Safety Analysis Report
Amendment No. 15 dated July 9, 1970 and
Amendment No. 16 dated July 23, 1970

These comments are attached, and we would appreciate your including them with other Reactor Development & Technology Division comments or forwarding copies to the Division of Reactor Licensing.

Sincerely,

Isaac Van der Hoven, Chief
Air Resources Environmental Laboratory
Air Resources Laboratories

Attachment
As stated

cc:
I. Spickler, USAEC

bcc.
Dr. Gifford, ARATDL

1445

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ESSA FORM 61-2 (FORMERLY ESSA FORM 7)

ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION

Comments on

Oconee Nuclear Station Units 1, 2, and 3
Duke Power Company
Final Safety Analysis Report
Amendment No. 15 dated July 9, 1970 and
Amendment No. 16 Dated July 23, 1970

Prepared by

Air Resources Environmental Laboratory
Environmental Science Services Administration
July 29, 1970

The fifteen gas tracer experiments conducted on the site under poor (inversion) conditions show that in all cases the centerline concentration was lower than that which would have been predicted by the use of the equivalent Pasquill Type diffusion rates. The closest agreement for a stability category of Type F was in test 1 b (see Table 2A-2) where at a distance of 660 m a centerline concentration of 4×10^{-5} sec m^{-3} was measured at a wind speed of 5.4 m/sec. The equivalent estimated concentration for Pasquill Type F would be 2.4×10^{-4} sec m^{-3}, a factor of 6 higher than the measured value. It must, however, be assumed that a building wake effect is part of the cause for this difference. Allowing a cA factor of 1270 m^2 for this effect brings the estimated value to a factor of 2.2 higher than the measured value.

An examination of the joint frequency tabulation of wind at the top of the 150-ft tower under slightly stable and moderately to strongly stable conditions shows a cumulative frequency of 9 percent for a diffusion rate equal to or worse than Pasquill Type F and 1.5 m/sec. Extrapolating the data to the 5 percent level of probability results in a diffusion rate equivalent to Type F and 1 m/sec.

Although a wind speed calibration check made in October 1969 indicated the speed to be reading low by a factor of 1.4, there is no rigorous way to determine how long this situation has persisted and to what extent the data in the joint frequency tables of speed and temperature lapse rate were affected.

It was obvious from a site visit by AEC and ESSA personnel in February 1970 that the terrain within the site boundary is very complicated and that it is difficult to make near-surface measurements which would be representative of the general flow of air in the area of the reactor

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complex. Because of the wooded nature of the terrain it was felt that the measurement above tree-top level at the top of the 150-ft micro-wave tower would most nearly represent the ambient flow from the reactor complex, although speeds would be somewhat overestimated with regard to near-surface conditions. However, it could well be that this overestimation is compensated for by the underestimation due to calibration errors.

In summary, for the short-term release (0-2 hours) it appears from the data presented that at the site boundary of 1.6 km, assuming an effective ground release, the use of Pasquill F diffusion, a 1 m/sec wind speed, a factor of 2.2 better diffusion because of site characteristics quantitatively shown by onsite diffusion experiments, and a χ/Q factor of 1270 m^2 because of building wake effect is appropriately conservative. The resulting concentration would be approximately 1×10^{-4} sec m^{-3}.