JAN 2 4 1974

Voss A. Moore, Assistant Director for Light Water Reactors
Group 2, L

METEOROLOGY SECTION FOR SAFETY EVALUATION REPORT

PLANT NAME: Alvin W. Vogtle Nuclear Plant - Units 1,2,3&4
LICENSING STAGE: CP
DOCKET NUMBERS: 50-424, 50-425, 50-426 & 50-427
RESPONSIBLE BRANCH: LWR 2-2
REQUESTED COMPLETION DATE: January 15, 1974
APPLICANTS RESPONSE DATE NECESSARY FOR
NEXT ACTION PLANNED ON PROJECT: As Scheduled
DESCRIPTION OF RESPONSE: N/A
REVIEW STATUS: Site Analysis Branch (Meteorology) - Complete

Enclosed is the meteorology section for inclusion in the Safety Evaluation Report on the subject plant.

This SER input (minus the X/Q values) was previously transmitted to LWR Group 1 on December 6, 1973. The applicant has since provided the data needed by the meteorological staff and the SER input has now been finalized with the insertion of the previously missing information. The relevant information has also been transmitted informally to the Licensing Project Manager.

This section was prepared by R. A. Kornasiewicz and E. H. Markee, Jr., Site Analysis Branch, L.

Original signed by
H. R. Denton

Harold R. Denton, Assistant Director
for Site Safety
Directorate of Licensing

Enclosure:
As stated

cc: See attached page.

MEMO

cc: w/o enclosure
A. Giambusso
W. McDonald
J. Panzarella
SS Branch Chiefs
A. Kenneke

cc: w/enclosure
S. Hanauer
J. Hendrie
W. Gammill
K. Kniel
L. Crocker
R. Klecker
D. Eisenhut
J. Carter
S. Varga
R. Kornasiewicz
E. Markee

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SURNAME	RKornasiewicz:jab	EHMarkee	WPGammill	HRDenton		

ALVIN W. VOGTLE NUCLEAR PLANT-UNITS 1/2/3 AND 4
DOCKET NUMBERS 50-424/50-425/50-426 AND 50-427
SAFETY EVALUATION REPORT INPUT

2.3 METEOROLOGY

2.3.1 Regional Climatology

Eastern Georgia has a humid, continental climate, with mild, winters and relatively long, hot summers, characteristic of continental climates in southern regions. The air mass type dominant over the area during the warmer portions of the year is maritime tropical which originates over the Gulf of Mexico. During the colder months, continental polar air of Canadian origin frequently alternates with the maritime tropical air over the region. Temperature extremes in winter are modifed as a result of the long overland trajectory of the cold air from the Canadian source regions and its descent of the eastern slopes of the Appalachians. Precipitation is rather uniformly distributed throughout the year, occurring most frequently as thundershowers in the summer and as rain in the winter and early spring. High air pollution potential (atmospheric stagnation) is expected to exist, on the

average, on five days during the year. Atmospheric dispersion rates are expected to be about average for all areas in the eastern United States.

2.3.2 Local Meteorology

The plant is sited on the southwest side of the Savannah River, about 25 miles southeast of Augusta, Georgia, on a low bluff about 150 feet above the level of the river. There is, topographically, little relief about the plant site. High wind occurrences in the area are associated mainly with severe thunderstorms or tropical storms and hurricanes. During the period 1871 through 1971, 35 tropical storms or hurricanes have passed within 50 miles of the site. Eighteen tornadoes were reported within the one degree latitude-longitude square containing the site during the period 1955-1967, giving a mean annual frequency of 1.4 and a computed recurrence interval of 1000 years. While snowfall is not usually significant, averaging only about one-half of an inch annually at Augusta, freezing rain and the resultant icing conditions may be expected about twice a year. The predominant wind flow over the site is from the west.

2.3.3 Onsite Meteorological Measurements Program

An onsite meteorological measurements program (which follows the recommendations of Regulatory Guide 1.23) was initiated in April 1972. The program consists of the installation of and measurements from a 150-ft tower constructed on the site 5,200 feet south-southwest of the Unit 1 containment building. Temperature instruments are located at the 33-, 95- and 150-foot levels on the tower and wind measuring instruments are located at the 33-, 100- and 150-foot levels. The applicant has submitted a (one year) period of data record (12/4/72 - 12/4/73) in joint frequency form, similar to that suggested in Regulatory Guide 1.23, to provide a basis for the staff's evaluation of atmospheric diffusion conditions. For the building and vent releases, the joint frequency distribution of wind direction and speed measured at the (33-foot) level, and vertical temperature difference (delta-T) between the (33-foot) and (150-foot) levels was used. The joint data recovery during the (one year) period of record was (80.1) percent. A lightning strike on the meteorological tower, about mid-way through the annual cycle, destroyed most of the sensors. The resulting outage was responsible for the majority of missing data during the collection period. The applicant (with the staff's concurrence) substituted wind directions measured at the 150-foot level, during periods when the direction sensor at the 33-foot level was inoperative, to obtain a representative amount of onsite data.

2.3.4 Short Term (Accident) Diffusion Estimates

In the evaluation of short term (0-2 hours at the site boundary and 0-8 hours at the LPZ) accidental releases from the buildings and vents, a ground level release with a building wake factor, cA, of 1350 meters^2 was assumed. The relative concentration (X/Q) for 0-2 hours which is exceeded 5% of the time was calculated, using the model described in Regulatory Guide 1.4, to be 2.8×10^{-4} sec/m^3 at the minimum site boundary distance of 1067 meters. The relative concentration is equivalent to Pasquill type F with a wind speed of 1.1 meters/second. The relative concentration which is exceeded 5% of the time at the outer boundary of the low population zone (3220m) was calculated to be 1.0×10^{-4} sec/m^3. The estimated relative concentration at the LPZ for the 8-24 hour period is 2.1×10^{-5} sec/m^3, for the 1-4 day period is 8.7×10^{-6} sec/m^3 and for 4-30 day period is 2.5×10^{-6} sec/m^3.

2.3.5 Long Term (Routine) Diffusion Estimates

The highest offsite annual average relative concentration of 2.7×10^{-6} sec/m^3 for vent releases occurred at the site boundary northeast of the reactor complex.

2.3.6 Conclusions

The staff concludes that the meteorological data presented in the PSAR provide an adequate basis to make estimates of atmospheric diffusion for accidental and routine gaseous releases from the plant.