ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
UNITED STATES ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

April 16, 1974

Honorable Dixy Lee Ray
Chairman
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subject: REPORT ON ALVIN W. VOGTLE NUCLEAR PLANT, UNITS 1, 2, 3, AND 4

Dear Dr. Ray:

At its 168th meeting, April 11-13, 1974, the Advisory Committee on Reactor Safeguards reviewed the application by the Georgia Power Company for a permit to construct the four-unit Alvin W. Vogtle Nuclear Plant. The Subcommittee made a visit to the plant site on March 28, 1974, and the project was considered at a Subcommittee meeting at Bush Field, Augusta, Georgia, on March 29, 1974. During its review the Committee had the benefit of discussions with representatives and consultants of the Applicant, Southern Services, Incorporated, Westinghouse Electric Corporation, Bechtel Power Corporation and the AEC Regulatory Staff. The Committee also had the benefit of the documents listed below.

The plant will be located on the Savannah River in Burke County, Georgia, approximately 26 miles south-southeast of Augusta, Georgia, the nearest population center (reported 1970 population of 59,864). A minimum exclusion area radius of 3600 feet has been specified. The radius of the low population zone (1977 estimated population of 15) has been selected to be two miles. Major land use in the area of the plant site is devoted to timber, with agriculture using about 30 percent of the land within a radius of five miles.

Each unit of the plant will utilize a Westinghouse four-loop pressurized water nuclear steam supply system having a design power level of 3411 MWt and a design essentially the same as that provided for the Catawba Station which was previously reviewed and reported by the Committee in its letter of November 13, 1973.

The seismic design bases for the plant are 0.2g horizontal ground acceleration for the safe shutdown earthquake and 0.12g horizontal ground acceleration for the operating basis earthquake. These values have been derived from experience with the Charleston, South Carolina, earthquake of 1886 as it affected the Vogtle site surroundings, and the Committee believes that they are appropriate to this site location.

The foundation structures will be supported on a marl deposit that has been investigated by the Applicant and found to be suitable for the purpose. Tests of the marl, whose minimum thickness is approximately 70 feet, have shown that it effectively separates the reactor site from the lower Tuscaloosa aquifer, a major regional water distribution channel. The Applicant has indicated that he will carefully evaluate the foundation excavation to verify the properties of the marl and to identify any conditions relevant to the seismic design of the plant.

The ultimate heat sink for the plant is provided by two seismic Category I mechanical-draft cooling towers for each unit. The Applicant has determined that, based on present design requirements, the cooling tower basins will have ample storage capacity for a 30-day emergency cooling demand. He also plans to install two seismic Category I wells for each unit, which would supply makeup water to the ultimate heat sink if future design shows a need for further emergency cooling water capacity. The seismic Category I requirements for these wells are still being evaluated. If the wells are needed for emergency cooling water purposes, these requirements should be met in a manner satisfactory to the Regulatory Staff.

The Committee recommended in its report of September 10, 1973, on acceptance criteria for ECCS, that significantly improved ECCS capability should be provided for reactors filing for construction permits after January 7, 1973. The Vogtle Plant is in this category. This plant will use 17x17 fuel assemblies similar to those to be used in Catawba Units 1 and 2, recently reviewed by the Committee. While details of the proposed design are available, complete analyses of the performance of this fuel arrangement are not yet available from the Applicant, and the AEC Regulatory Staff has not completed their review. The Committee has been informed that performance analyses and reviews will be conducted during the coming year in connection with operating license applications for other nuclear units. The Committee believes that the Applicant should continue studies that are responsive to the Committee's examples of design improvements. If studies establish that significant further improvements can be achieved, consideration should be given to including such additions to this plant.

The proposed emergency diesel-generators are larger than any previously qualified for nuclear service. The Applicant has proposed reliability tests as required for qualification. This matter should be resolved in a manner satisfactory to the Regulatory Staff.

The proximity of the AEC's Savannah River Plant and the Barnwell Nuclear Fuel Plant makes it important to have effective emergency arrangements to deal with unusual circumstances that may be of interrelated safety significance to the three plants. The Applicant has indicated that he will establish an emergency plan in cooperation with these other nuclear

installations to ensure effective emergency response if demanded by events in the immediate area. Consideration should be given by the AEC to periodic evaluations of the combined routine liquid and airborne radionuclide releases from these two plants and the Vogtle Plant as they may affect the health and safety of the public.

Generic problems relating to large water reactors have been identified by the Regulatory Staff and the ACRS and discussed in the Committee's report dated February 13, 1974. These problems should be dealt with appropriately by the Regulatory Staff and the Applicant, taking into account the nine-year construction period for the four-unit plant.

The ACRS believes that the above items can be resolved during construction and that, if due consideration is given to these items, the Alvin W. Vogtle Nuclear Plant, Units 1, 2, 3, and 4 can be constructed with reasonable assurance that they can be operated without undue risk to the health and safety of the public.

Sincerely yours,

W. R. Stratton

W. R. Stratton
Chairman

References:

1) Preliminary Safety Analysis Report (PSAR), Volumes I-IX, Alvin W. Vogtle Nuclear Plant, dated February 8, 1973

2) Amendments 1 through 17 to the PSAR

3) Safety Evaluation Report by the Directorate of Licensing, USAEC, Alvin W. Vogtle Plant, Units 1, 2, 3, and 4, dated March 8, 1974

4) Letter, Ernest L. Dodson, Department of the Army, Office of the Chief of Engineers, to T. Cardone, Directorate of Licensing, USAEC, dated January 31, 1974 (with enclosure dated January 30, 1974, regarding Amendment 13 to the PSAR)

5) Letter, Elmer H. Baltz, U. S. Department of the Interior, Geological Survey, to William P. Gammill, Directorate of Licensing, USAEC, dated February 21, 1974 (with enclosure dated February 8, 1974, regarding geologic aspects of the Alvin W. Vogtle Nuclear Plant)

References (cont'd)

6) Written Statement by Solomon K. Brown, dated March 19, 1974

7) Written Statement by Solomon K. Brown, dated March 22, 1974

8) Written Statement by Neill Herring, Georgia Power Project, submitted March 29, 1974