November 29, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the matter of	:	
	:	
GEORGIA POWER COMPANY, et al.	:	Docket Nos. 50-424
	:	50-425
(Vogtle Electric Generating Plant, Units 1 and 2)	:	

APPLICANTS' RESPONSE TO INTERVENORS' FIRST SET OF INTERROGATORIES AND REQUEST FOR PRODUCTION OF DOCUMENTS

On October 25, 1984, Joint Intervenors Campaign for a Prosperous Georgia and Georgians Against Nuclear Energy served upon Applicants by mail their First Set of Interrogatories and Requests to Produce. Applicants provide herein their responses to those discovery requests.

OBJECTIONS TO INSTRUCTIONS

Applicants object to the preliminary instructions contained in Intervenors' First Set of Interrogatories and Requests to Produce to the extent that (1) the Intervenors seek to impose requirements upon the Applicants beyond those permitted by the Nuclear Regulatory Commission's Rules of Practice for Domestic Licensing Proceedings and (2) those instructions request the production of documents

protected from discovery by the attorney-client privilege or the work product privilege.

ANSWERS AND OBJECTIONS TO SPECIFIC INTERROGATORIES AND REQUESTS TO PRODUCE

Applicants respond as follows to the individually numbered interrogatories and requests for production of documents contained in Intervenors' First Set of Interrogatories and Requests to Produce.

A-1. Please identify (by name, business, address, occupation and employer) a) all individuals who have knowledge or information responsive to each interrogatory and designate the interrogatory or the part thereof which that individual answered; and b) each person you expect to call as an expert witness in this proceeding as well as a brief description of the subject matter on which that person is expected to testify and the substance of that testimony, the witness's educational and professional background, and the identity of any previous proceedings in which that person has testified.

RESPONSE: (a) Applicants object to interrogatory A-1(a) on the following grounds:

(1) interrogatory A-1(a) is vague, confusing, and not susceptible to a proper response by Applicants,

(2) to the extent that interrogatory A-1(a) requests information about persons other than those who provided

information used by Applicants in responding to these discovery requests, it is overly broad, unduly burdensome, and oppressive.

Subject to these objections, Applicants further respond to interrogatory A-1(a) by stating that the Applicants' responses to the Intervenors' first interrogatories were prepared by Applicants' attorneys based upon information received from the following persons:

John A. Achenbach - Engineer
Instrumentation and Control
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- Interrogatories F-1 through F-7, J-1 through J-3, L-1 through L-4, and N-1 through N-3.

James M. Adams - Engineer
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James A. Bailey - Project Licensing Manager
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- Interrogatory N-1.

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- Interrogatories R-1, R-2, R-3, and R-7.

Willard L. Bowers -

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- Interrogatories B-1 through B-32 and R-1 through R-9.

Robert W. Carlson -

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Reactor Coolant System ("RCS")
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- Interrogatories P-1 and P-7 through P-15.

Steven J. Cereghino -

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Elaine Y. Chang - Environmental Engineer
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- Interrogatory R-4

Thomas W. Crosby - Geologist
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- Interrogatories B-1, B-2, B-3, B-4, B-5, B-8, B-9, B-10, B-11, B-12, B-15, B-18, B-20, B-21, B-23, B-24, B-25, B-26, B-29, B-30, and B-31.

Norman D. Dennis - Site Environmental Supervisor
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- Interrogatories B-15 and B-22

Clarence G. Draughon - Manager
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- Interrogatories F-1 through F-7, J-1 through J-3, L-1 through L-4, and N-1 through N-3.

C. R. Farrell - Hydrogeologist
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Kathleen M. Fitzgerald - Environmental Engineer
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- Interrogatories R-1, R-2, R-3, and R-7.

V. C. Gonzales - Equipment Qualification Supervisor
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- Interrogatories F-1 through F-7 and J-1 through J-3.

Carl N. Hirst - Manager
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- Interrogatories P-1 and P-7 through P-15.

Steven M. Kane - Nuclear Engineer
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- Interrogatories R-1, R-2, R-3, and R-7.

William Kershul - (former) Nuclear Engineer
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- Interrogatories R-1, R-2, R-3, and R-7.

Joel Kitchens - Assistant to the Chief
Electrical Engineer
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- Interrogatories F-1 through F-7 and J-1 through J-3.

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- Interrogatories F-1 through F-7, J-1 through J-3, L-1 through L-4, and N-1 through N-3.

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- Interrogatories P-1 and P-7 through P-15.

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- Interrogatories F-1 through F-7, J-1 through J-3, L-1 through L-4, and N-1 through N-3.

Steve Phillips -

Maintenance Supervisor
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- Interrogatory D-3.

Gary T. Quinn -

Environmental Engineer
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- Interrogatories R-1, R-2, R-3, and R-7.

Joseph R. Schulties -

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Ken C. Stokes -

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- Interrogatory D-1.

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Daniel H. Warren - Environmental Licensing Engineer
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- Interrogatories B-1 through B-32 and R-1 through R-9.

L. R. West Hydrogeologist
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Interrogatories B-1, B-2, B-4, B-5, B-8, B-9, B-10, B-11, B-12, B-15, B-18, B-20, B-21, B-23, B-24, B-25, B-26, B-29, B-30, and B-31.

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Southern Company Services
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- Interrogatories D-2, D-3, and L-2.

Gary W. Whiteman RCS Components Licensing, NTD
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- Interrogatories P-1 and P-7 through P-15.

(b) Morton I. Goldman, Sc.D., Senior Vice President and Technical Director, NUS Corp., 910 Clopper Road, Gaithersburg, Maryland 20878. Applicants expect Mr. Goldman to testify concerning cooling tower salt drift. Mr. Goldman has not at this time compiled the facts nor formulated the opinions to which he will testify. Applicants will supplement this response to provide the information requested concerning Mr. Goldman's background and prior proceedings in which he has testified.

B-1. Please characterize the hydrology from the surface at and within twenty-five miles of the Vogtle site downward through the Tuscaloosa aquifer (including the Lisbon Sand Formation and other overlying and underlying water formations). Specify both the techniques used to characterize the hydrology and describe the data using scientific inference, i.e., ranges of uncertainty, etc.

RESPONSE: Sections 2.4.12.1 and 2.4.12.2 of the Vogtle Electric Generating Plant ("VEGP") Final Safety Analysis Report ("FSAR") describe the occurrence, movement, and utilization of ground water in the vicinity of Plant Vogtle. The regional ground water hydrology is described in § 2.4.12.1.1 of the FSAR, while § 2.4.12.1.2 discusses the ground water hydrology local to the plant site.

The general ground water characteristics of the area were determined by reviewing published reports concerning the geology and ground water hydrology of the region. The reports on which the discussion of the regional ground water hydrology are based are identified in the reference list for § 2.4.12 of the FSAR. That list incudes the "Studies of Postulated Millett Fault" prepared by Bechtel Power Corporation, which discusses the geology and hydrology of the VEGP site and the surrounding area in Chapters 4 and 5.

Ground water conditions in the vicinity of the site were determined on the basis of exploratory holes drilled to collect information about the type and sequence of materials, their thicknesses and hydrogeologic relationships. In-situ permeability tests were conducted in some of the exploratory holes. Using the data from this exploration program, aquifers and aquicludes were identified and related to the regional aquifers. Selected holes were completed as observation wells to provide a monitoring network. The results of the exploratory work, the permeability testing, and the water level measurements are described in §§ 2.4.13 and 2.5.1 of the VEGP Preliminary Safety Analysis Report ("PSAR") and §§ 2.4.12 and 2.5.1 of the FSAR.

The methods used in analyzing the data obtained from these reports and site investigations are described in §§ 2.4 and 2.5 of the FSAR and the PSAR.

Applicants object to that portion of interrogatory B-1 that requests them to "describe the data using scientific inference, i.e., ranges of uncertainty, etc." on the ground that it is vague, confusing, and not susceptible to a proper response.

B-2. Describe each study or test the Applicant has conducted to assure that the underlying clays will prevent penetration of radioactive spills into the ground water. Please provide copies of the tests and the test results.

RESPONSE: The effectiveness of the Blue Bluff marl underlying the plant site as a barrier to ground water movement between the water table aquifer and the Tertiary and Cretaceous aquifers has been confirmed in several ways. These include field permeability tests, laboratory permeability tests, inspection of core samples, examination of portions of the marl exposed by plant excavations, and water levels measured in observation wells. The general conclusions reached on the basis of the information derived by these different means are summarized in Appendix 2B of the FSAR.

The first field permeability tests performed on the marl are discussed in §§ 2.4.13.2.1.3 and 2.4.13.2.3.1 of the PSAR. Table 2.4-5 of the PSAR reflects the data obtained from these tests. Later field permeability tests were conducted in drill holes 501 through 508, 510, 513, 518. No flow of water into the marl was found during these tests, which evidences the effective impermeability of the marl. The data from these tests are shown on the geologic logs of the holes in Appendix 2C of the PSAR. During foundation investigations for the river facilities, further field permeability tests were conducted in 12 drill holes. The data from these tests are addressed in § 2.4.12.2.4.2 of the FSAR and are summarized in Table 2.4.12-9 in the FSAR, and a complete description of the

testing procedures utilized can be found in "Report on Foundation Investigations for River Facilities - Addendum - Oct. 1979."

Laboratory permeability tests conducted on core samples obtained from exploration holes have also confirmed the effective impermeability of the marl. The PSAR Appendix 2C reflects the data produced by those tests.

Excavations for the VEGP power block exposed approximately the upper 25 feet of the marl over a surface area of more than one million square feet. The marl surface was examined and the entire excavation was mapped in detail. This mapping is shown graphically in Figures 2.5.1-23, 2.5.1-24, 2.5.1-26, 2.5.1-27, and 2.5.1-28 of the FSAR. The results of the mapping are discussed in § 2.5.1.2.2.2.1.1.1 and Appendix 2B of the FSAR and in the Applicant's response to NRC question 241.9 in Amendment 6, to the FSAR, dated May 1984. This examination of the marl revealed no voids, dissolution cavities, systematic fractures, or joints that would provide a path for movement of ground water through the marl.

Finally, the consistently large differences between water levels (head) measured in observation wells open to the sands immediately above the marl and water levels measured in wells open to the sands immediately below the marl provide further proof of the effective impermeability of the marl as discussed in § 2.4.12.2.3.1 of the FSAR.

Those water level measurements are reflected in Table 2.4-2 of the PSAR and Table 2.4.12-7 of the FSAR.

B-3. (a) Where is the Tuscaloosa Aquifer located?

(b) Discuss the hydraulic confinement of the Tuscaloosa Aquifer under Plant Vogtle and to a distance of 25 miles from the plant site.

(c) Where does it interact with other ground water under the Plant Vogtle site and within twenty-five miles of the Plant Vogtle site?

RESPONSE: The Cretaceous aquifer (also referred to as the lower confined or Tuscaloosa aquifer) is located beneath the Coastal Plains of Georgia and South Carolina. Sections 2.4.12.1.1. and 2.4.12.1.2 of the FSAR and Chapter 5 of the "Studies of Postulated Millett Fault" discuss the location and confinement of the Cretaceous aquifer and its interaction with other aquifers beneath Plant Vogtle.

B-4. (a) What wells have been dug on and within twenty-five miles of the Plant Vogtle site? Include complete descriptive data on any wells in this area (e.g., well depth, water pressure, casing description, construction, water analysis, etc.) and similar data on other types of surface penetrations within the area.

(b) What measures has the Applicant taken to assure that it has identified all such wells?

(c) What measures has the Applicant taken to assure that none of such wells have penetrated the aquifer?

(d) What measures has the Applicant taken to assure that such wells will not provide a route for penetration of aquifer?

RESPONSE: (a) Information on water wells off site has been collected in well surveys as part of the initial site investigation and subsequent investigations. On-site wells have been drilled for different purposes, including observation wells, wells for construction water, and wells for plant make-up water.

A door-to-door water well canvass was conducted in September 1971 and March 1972 in the vicinity of the plant site. A Burke County road map showing detailed cultural information, including houses and public buildings, was used to aid in locating and inspecting all wells on the west side of the Savannah River within 7 miles of the site and 60 percent of the wells within 10 miles. That well canvass is described in §2.4.13.2.1 of the PSAR, § 2.5.4 of the VEGP construction permit stage Environmental Report ("CP-ER"), and § 6.1.2.1 of the VEGP operating license stage Environmental Report ("OL-ER"). The well data obtained from that survey is shown in Table 2.4-4 of the PSAR. Wells on the east side of the river and within 10 miles of the site are also discussed in §2.4.13.2.1 of the

PSAR, and the well data are shown on Table 2.4-4 of the PSAR.

In May and June 1982, a water well canvass was conducted as part of the Millett study. This canvass covered 4400 square miles around the plant site. In that area 886 wells were located. As part of that canvass, USGS topographic quadrangles and county road maps showing cultural features were used to help identify where wells might be located. Water well data were also obtained from the files of the USGS and State Geological Survey offices in Georgia and South Carolina. The well canvass and the data obtained are discussed in Chapters 6 and 7 and Appendices B and C of the "Studies of Postulated Millett Fault."

On March 13, 1984, a door-to-door well canvass was conducted to identify the location of off-site domestic wells within a 2-mile radius of the plant. Results of this well canvass are presented in the FSAR in response to the NRC's Question 240.5 at Page Q240.5-1.

Observation wells have been constructed at Plant Vogtle to monitor water levels (1) in the water table aquifer, (2) in the marl confining layer, (3) in the underlying Tertiary and Cretaceous aquifers, and (4) in the backfill of the power block excavation. Data pertaining to the wells constructed prior to March 1972 are in § 2.4.13.2.1.1, Appendix 3K, and Tables 2.4-2 and 2.4-3 of the PSAR. Observation wells constructed after 1972 are

discussed in § 2.4.12.2.3 of the FSAR, and the data are summarized on Table 2.4.12-7 of the FSAR.

Eight wells located on the plant site produce water from the Tertiary and Cretaceous aquifers. Three wells have been installed at the plant site to provide water needed during construction. Those wells are located at the Batch Plant, the Construction Office, and the Environmental Building. A well has also been installed at the Simulator Building. Each of these wells is at least 220 feet deep. In addition, four other wells designated TW-1, MU-1, MU-2, and MU-2A have been drilled on site. Details of well TW-1 are discussed in Appendix 3K of the PSAR and Figure 2.4.12-8 of the FSAR. Wells MU-1, MU-2, and MU-2A are discussed in §§ 2.4.12.1.3.3 and 2.4.12.2.4.1 of the FSAR.

At Plant Wilson, a combustion turbine facility adjacent to Plant Vogtle to the southeast, a well has been installed that is approximately 90 feet deep. That well draws from the water table aquifer.

(b) Applicants have not attempted to identify all wells within twenty-five miles of the plant site. Those efforts that it has undertaken to identify wells in the vicinity of the VEGP are described in the Applicants' response to part (a) of this interrogatory.

(c) Applicants object to part (c) of interrogatory B-4 on the ground that it is vague, confusing, and

not susceptible to a proper response. With the exception of two observation wells drilled into the marl beneath the plant site, all of the wells described above penetrate into an aquifer, whether the water table aquifer, the Tertiary aquifer, or the Cretaceous aquifer.

(d) The Applicants have not taken any measures concerning off-site wells. The references cited in the Applicants' response to part (a) of this interrogatory contain whatever information is in the Applicants' possession concerning the construction of off-site wells. Construction of on-site wells is discussed in §§2.4.12.1.3.3 and 2.4.12.3 of the FSAR and in Appendix 3K of the PSAR.

B-5. Where are the connections between the various aquifers under and within twenty-five miles of the Plant Vogtle site located?

RESPONSE: The aquifers beneath Plant Vogtle and within the region are complex. The locations where these aquifers are in hydrologic connection and where they are separated by various confining layers are discussed in §§ 2.4.12.1.1 and 2.4.12.1.2 of the FSAR, in Appendix 2B of the FSAR, and in § 2.4.2 of the OL-ER. In further response to interrogatory B-5, Applicants refer Intervenors to and incorporate herein their responses to interrogatories B-1 and B-3.

B-6. Please list all ground water contamination discovered at Plant Hatch and all studies of the tritium contamination of ground water at Plant Hatch.

RESPONSE: Applicants object to interrogatory B-6 on the following grounds:

(1) interrogatory B-6 seeks information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory B-6 requests information outside the scope of those matters identified as being in controversy in this proceeding by the Atomic Safety Licensing Board ("Board") in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2-715a.

B-7. What provisions has the Applicant made for long-term monitoring of the surface water and ground water on and within twenty-five miles of the Plant Vogtle site-before, during and after operation of the plant?

RESPONSE: Applicants interpret interrogatory B-7 to request information concerning the long-term radiological monitoring program of the surface and ground water for the VEGP. Section 6.1 of the VEGP OL-ER describes the pre-operational environmental radiological monitoring program, including the monitoring of surface and ground water. The pre-operational radiological monitoring began in August, 1981. The results of the pre-operational

radiological monitoring program are summarized in the OL-ER § 6.4.

The operational environmental radiological monitoring program will be established by the Radiological Effluent Technical Specifications as discussed in the OL-ER § 6.2.1. With minor modifications, the operational phase monitoring program will in all likelihood be a continuation of the pre-operational phase program.

Any post-operational environmental radiological monitoring programs associated with decommissioning the plant will be formulated prior to permanent cessation of plant operation. The program will be designed to comply with the applicable regulations in effect at that time.

B-8. (a) What is the Applicant's scientific basis for calling marl a "heavy clay"?

(b) What is the Applicant's basis for saying marl is "impermeable"?

(c) What reports support these positions?

RESPONSE: Studies of the Blue Bluff marl at Plant Vogtle have shown that it can be best described as a greenish to bluish-gray, moderately hard, calcareous clay. The composition and lithology of the marl at Plant Vogtle are discussed in Appendix 2B and §§ 2.4.12.1.2.2, 2.5.1.1.3.3.1.2, and 2.5.1.2.2.2.1.1 of the FSAR. The physical properties of the marl as a bearing stratum are described in § 2.5.4.2.2 of the FSAR.

The bases on which Applicants have concluded that the marl beneath the VEGP site is effectively impermeable, as well as the reports and site investigations that support that conclusion, are described in the above cited sections of the FSAR and in the Applicants' response to interrogatory B-2 above.

B-9. What consideration has the Applicant made of the Lisbon Sand Formation aquifer?

RESPONSE: The hydrologic properties of the unnamed sands of the Lisbon Formation, which comprise part of the Tertiary aquifer system, are discussed in §§ 2.4.12.1.2.2, 2.4.12.2.4.1, and 2.4.12.2.4.2 of the FSAR. Information concerning the permeability of various members of the Lisbon formation is shown in Table 2.4.12-9 of the FSAR.

B-10. Describe each test or study the Applicant has conducted that relates to spillage from the Vogtle Plant, including but not limited to spillages flowing to the Mathis Pond and hence to the Savannah River.

RESPONSE: Applicants interpret interrogatory B-10 to request information concerning analyses made concerning spillage of radioactive material at Plant Vogtle. In § 2.4.13.3.2 of the PSAR, which is entitled "Consideration of Accidental Spill of Radioactive Material," Applicants submitted a spill analysis made in response to the guidelines of the NRC Regulatory Guide 1.70 issued originally in October 1972. In response to a revision of the format

for the SAR in NUREG-0800 Standard Review Plan, Revision 2, July, 1981, the spill analysis was resubmitted in the FSAR under § 2.4.13.1, which is entitled "Consideration of Accidental Spill of Radioactive Material in Ground Water." The method and scope of this analysis and the basis for parameter values used in this analysis are described in those sections.

B-11. Describe the distinctions (if any) between the subsurface underlying Plant Vogtle and the Savannah River Plant.

RESPONSE: Section 2.5.1.1 of the FSAR describes the regional geology for the areas surrounding Plant Vogtle, which includes the Savannah River Plant ("SRP"). The subsurface conditions for Plant Vogtle and portions of the SRP are also discussed in the "Studies of Postulated Millett Fault." The SRP consists of an area of over 300 square miles, while Plant Vogtle is slightly greater than 5 square miles in area. Considering this difference in the size of the two facilities, many distinctions between the subsurface conditions underlying the two plants undoubtedly could be identified. Some of these distinctions, in fact, are apparant from a comparison of (1) §§ 2.4.12 and 2.5 of the FSAR; (2) Appendix F of the L-Reactor Operation, Savannah River Plant, Final Environmental Impact Statement; and (3) Chapters 4 and 5 of the Millett Study.

While Applicants have not undertaken a detailed study of the differences between the subsurface conditions underlying these two facilities, some general geologic distinctions can be drawn from the various available studies and reports. The studies and reports that address subsurface conditions underneath the VEGP site are referenced in Applicants' response to interrogatory B-1. The geology and ground water beneath the SRP are described in the following report: Siple, G.E., "Geology and Ground Water of the Savannah River Plant and Vicinity, South Carolina," United States Geological Survey Water-Supply Paper 1841 (1967).

A significant consideration in comparing the two areas is that the same geologic formations have different physical characteristics in the two areas as a result of changes in depositional environment (facies changes). These changes include grain size, chemical composition, and other characteristics. Similarly ground-water characteristics (i.e., permeability, porosity, and transmissivity) of the formations vary with these changes. A pertinent illustration of these changes is the variation in composition of the Blue Bluff marl present beneath Plant Vogtle and its stratigraphic equivalent, the McBean Formation, present beneath the SRP. Siple discusses the differences in the composition of the McBean Formation beneath the SRP at pages 43-52 of his report. Table 2 of

this report clearly demonstrates the wide range in composition of this unit beneath the SRP. This variation is distinctly different from the uniform, effectively impermeable, dense, calcareous clay found beneath Plant Vogtle and described in Appendix 2B and §§ 2.4.12.1.2.2., 2.5.1.1.3.3.1.2, and 2.5.1.2.2.2.1.1. of the FSAR.

B-12. Characterize the movement of meteorological water infalling on and within twenty-five miles of the Vogtle site; this data should be categorized by the effects due to surface collection (e.g. of rainwater), to surface runoff, to percolation, etc. What effect will the presence of Plant Vogtle have on meteorological percolation rates and subsequent increased migration of surficial contamination vectors?

RESPONSE: Applicants object to interrogatory B-12 on the ground that it is vague, confusing, and not susceptible to a proper response. Specifically, Applicants do not understand what is meant by "meteorological percolation rates" or "surficial contamination vectors" and Applicants do not know what "data" Intervenors seek to have "categorized."

Subject to this objection, Applicants respond to interrogatory B-12 by interpreting "meteorological water infalling on" the plant site to refer to precipitation and "meteorological percolation rates" to mean infiltration. Precipitation falling on the surface of the ground at the Vogtle site and in its vicinity either will infiltrate the

ground or will run off as overland surface flow to streams. That portion of the precipitation that infiltrates the soil can be distributed in one of several ways, including retention as soil moisture, transfer to the atmosphere through the evaporation and transpiration processes, consumption in the growth of plants, discharge to adjacent streams, and percolation to the water table to become part of the ground water. Regional, local and on-site meteorology are discussed in § 2.3 of the FSAR.

At the Vogtle site the sandy nature of the soil, the lack of surface channeling on undisturbed areas, and moderate topographic relief suggest that relatively little of the precipitation falling on those areas runs off as surface flow. See § 2.4.12.1.2.3 of the FSAR. Grading and construction will alter the precipitation runoff infiltration characteristics in the plant area. Where grading has reduced slopes, ponding of precipitation can occur and higher infiltration may result. Where areas have been covered by pavement or by buildings, infiltration is negligible, and precipitation will be carried off as surface flow to adjacent areas where infiltration may occur or to drainage channels to be carried away as designed in the plant drainage system. The site grading and drainage plan is shown on Figure 2.4.1-2 of the FSAR. No definitive study has been made of the effect of Plant

Vogtle upon the precipitation runoff/infiltration characteristics. However, construction of the major features of the plant has been completed and the ground water table has recovered to levels similar to those measured prior to construction, which suggests that the impact of the plant on the infiltration/runoff relationship has been small.

B-13. Characterize the liquid waste flow systems for Plant Vogtle (by type, flow rates, effluent, flow containment, logistics, system physical description, mass-energy balances, etc.). Specifically include a discussion of the potential for failure at each point and the consequences thereof.

RESPONSE: Applicants object to interrogatory B-13 as being vague, confusing, and not susceptible to a proper response. Applicants do not understand what Intervenors mean by the terms "logistics" and "mass-energy balances" in relation to the characterization of liquid waste flow systems.

Subject to that objection, Applicants further respond to interrogatory B-13 by stating that they interpret "liquid waste flow systems" to refer to flow systems for both radioactive and non-radioactive liquid waste. The non-radioactive liquid waste streams for the VEGP are described in §§ 3.4.2, 3.4.3, 3.4.4, and 3.4.5 of the OL-ER and in §§ 9.2 and 2.4.13.2 of the FSAR. The concentration of chemicals and biocides in the effluents are

discussed in § 3.6 of the OL-ER, and the sanitary sewage discharge is described in § 3.7 of the OL-ER. Anticipated system flow rates are described in § 3.3 of the OL-ER. Sections 5.1, 5.3, and 5.4 of the OL-EP describe the effects of releases from the non-radioactive liquid waste flow systems.

The radwaste liquid waste flow system is described in §§ 3.5.2 of the OL-ER and § 11.2 of the FSAR. Individual systems are described in the § 10.4 of the FSAR. OL-ER § 5.2.4.1 describes the effects of releases from the radwaste flow system.

Discussions of accidents due to chemicals stored on site can be found in § 7.3 of the OL-ER. Discussions of accidents associated with liquid radwaste or radioactive water stored on site are set forth in §§ 7.1.6, 7.1.8, 7.1.9, 7.1.10, 7.1.11, and 7A of the OL-ER. Design basis accident analyses to establish performance requirements for the engineered safety features systems are found in Chapter 15 of the FSAR.

B-14. Please identify and describe the characteristics of each natural soil column for Plant Vogtle waste management (including radioactive and hazardous waste).

RESPONSE: Applicants interpret interrogatory B-14 to request information concerning on-site disposal of radioactive and hazardous waste in landfills. No on-site waste disposal facilities are included in the waste management

system for VEGP for either radioactive or hazardous waste. The solid radwaste system for VEGP is described in § 3.5.4 of the OL-ER and §§ 3.2 and 11.4 of the FSAR. The movement of solid radioactive waste is described in § 3.8.1.3 of the OL-ER and § 11.4.2.3.10 of the FSAR. As described in § 5.6.3 of the OL-ER, hazardous wastes generated as a result of the operation of Plant Vogtle will be packaged, transported, and disposed of off-site.

B-15.(a) What is the current well data base?

(b) What is the normalized (historical) well data base?

RESPONSE: The current well data base consists of water level measurements taken quarterly in observation wells. Data from such measurements since 1982 to the present will be produced for inspection and copying by the Intervenors. Applicants interpret "normalized (historical) well data base" to refer to water level measurements made over a period of time. Table 2.4.12-7 in the FSAR summarizes data concerning water level measurements at observation wells for the years 1971 to 1974 and 1979 to 1980. Similar information is also available from Table 2.4-2 in the PSAR.

B-16. What is the statistical inference of possible Plant Vogtle ground water (including aquifers) contamination compared to national contamination statistics?

RESPONSE: Applicants object to interrogatory B-16 on the following grounds:

(1) interrogatory B-16 seeks information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence,

(2) interrogatory B-16 requests information outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, and

(3) interrogatory B-16 is vague, confusing, and not susceptible to a proper response since the Applicants do not know what Intervenors mean when they refer to "national contamination statistics."

B-17. The Three Mile Island accident resulted in the use of clean-up water that itself became contaminated. What provisions for clean-up water (source, storage, etc.) has Applicant made for a similar emergency at Plant Vogtle? What would be the consequences to ground waters under and within twenty-five miles of Plant Vogtle if such an emergency arose?

RESPONSE: Applicants have made no special provisions for clean-up water for use in an emergency at VEGP similar to that that occurred at Three Mile Island. In the event that such measures were necessary, storage of clean-up

water would be accommodated by existing storage capacity at the VEGP site and, if necessary, temporary storage capacity provided by temporary tanks or containers. Any water involved in a clean-up process would be treated and recycled or discharged in accordance with regulatory requirements. Therefore, if such a situation were to arise at VEGP, any clean-up water used would have no impact upon ground water beneath and within 25 miles of VEGP.

B-18. Describe all tests, studies, analyses or surveys

(a) of the geologic fracture zones which provide transfer between surface water and surficial and deep aquifers on and within twenty-file miles of the Plant Vogtle site;

(b) of concentrations of radionuclides and toxic substances in surficial and deep aquifers on and within twenty-five miles of the Plant Vogtle site; and

(c) that consider the cumulative effects of the operation of the Savannah River Plant and Plant Vogtle on the ground water and aquifers.

RESPONSE: (a) As discussed in Applicants' response to interrogatory B-2, several studies have been conducted to determine the hydraulic interconnection of the aquifer systems beneath the VEGP site. Those studies include permeability testing of the subsurface units, monitoring

water levels in observation wells, examination of drill core samples, and mapping of the portion of the marl exposed by the excavation for the power block.

As indicated in Applicants' response to interrogatory B-2, these studies show that beneath the plant site the marl is effectively impermeable and would prevent any movement of ground water between the water table aquifer above the marl and the Tertiary and Cretaceous aquifers below the marl. Moreover, as described in the Applicants' response to NRC question 241.9 in Amendment 6 to the FSAR dated May 1984 and in § 2.4.12.2.3.1 of the FSAR, none of the exploratory holes that penetrated the marl beneath the plant site detected a permeable zone or experienced water losses that would suggest the presence of fracture zones in the marl that would be capable of providing an avenue for transfer of water.

(b) Applicants interpret "surficial aquifers" to refer to the water table aquifer and "deep aquifers" to refer to the Tertiary and Cretaceous aquifers. The pre-operational environmental radiological monitoring program for ground water is described in § 6.1 of the OL-ER, as discussed in Applicants' response to interrogatory B-7. The results of this program are summarized in § 6.4 of the OL-ER.

To date, Applicants have not conducted analyses of water from wells on the VEGP site that are in the water

table aquifer, the Tertiary aquifer, or the Cretaceous aquifer to detect toxic substances. Standard water quality tests have been conducted on water from each of these aquifers and are summarized in Tables 2.4.12-3, 2.4.12-4, and 2.4.12-5 of the FSAR for observation wells, domestic wells, and springs.

The Applicants were contacted on November 2, 1984 by the State of Georgia Geological Survey requesting permission to sample water from a VEGP makeup water well as part of a larger sampling program that the Geological Survey is conducting statewide. The sample will be analyzed for: standard water quality parameters, ICAP metals, chlorinated pesticides, phenoxy herbicides, and other substances. The sampling was performed on November 27, 1984. The Applicants also intend to sample the well and conduct an independent analysis.

Applicants also have in their possession documents produced and released by the Savannah River Plant relating to the concentrations of radionuclides and toxic substances in ground water, which documents will be made available for inspection and copying by the Intervenors.

(c) Applicants object to part (c) of interrogatory B-18 on the following grounds:

(1) interrogatory B-18(c) asks for information that is not relevant to the subject matter of this

proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory B-18(c) seeks information beyond the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a.

B-19. Describe all provisions, plans and measures of the Applicant to monitor and observe the migration of contamination in the ground at and within twenty-five miles of the Plant Vogtle site.

RESPONSE: Applicants' response to interrogatory B-7 describes those programs adopted or planned by the Applicants for radiological monitoring of surface water and ground water at VEGP. Applicants refer Intervenors to and incorporate herein their response to interrogatory B-7.

B-20. To what extent was Cook's study (reference 5, ground water, FSAR) relied upon in the Applicant's conclusions? How was his data updated?

RESPONSE: Reference 5 in § 2.4.12 of the FSAR is a study by C. W. Cooke, entitled "Geology of the Coastal Plain of Georgia." In that report, Cooke briefly describes Pleistocene age terraces found on the Coastal Plain of Georgia. The FSAR refers to the composition of these deposits on page 2.4.12-7 in describing the Pleistocene terrace sediments of the region. Neither this reference

nor Cooke's report was relied upon for any conclusions made by the Applicants about the ground water conditions beneath Plant Vogtle. Because Cooke's report was not site specific, no need existed to update his data.

B-21. What surface data from Cook's study are extrapolated into the subsurface analysis?

RESPONSE: None.

B-22. Water quality analyses listed in the FSAR are 13 years old and appear to represent the results of a one-time-only analysis. Justify this one-time-only analysis. What, if any, more recent analyses have been conducted?

RESPONSE: Applicants object to interrogatory B-22 on the following grounds:

(1) interrogatory B-22 seeks information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory B-22 asks for information outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2-715a.

Subject to these objections, Applicants state in further response to interrogatory B-22 that water from make-up wells 1 and 2 has been analyzed for coliform

bacteria on a quarterly sampling schedule from February 1978 to the present. Water from construction wells 1 and 2 has been analyzed for coliform bacteria on a quarterly sampling schedule since June 1982. Also, chemical analyses have been performed at various times between 1977 and 1982 on water from construction wells 1, 2, and 3; make-up wells 1 and 2; and the well adjacent to the Simulator Building.

B-23. What geophysical well log data from the State of Georgia Geological Survey and the U.S.G.S. were used by the Applicant? Why are they not listed in the FSAR? If none were used, what is the Applicant's justification for not using them?

RESPONSE: Geophysical well logs from the State of Georgia Geological Survey and the USGS have been used by the Applicants. In particular, such logs were used in the "Studies of Postulated Millett Fault," which is one of the references listed for § 2.4.12 of the FSAR. Those logs used in the 1982 Millett study are indicated in Chapter 7 and Appendices A and C of that report. Figure 7-1 of that report shows the location of all wells that have geophysical logs in the region. The Millett study has been submitted to the Nuclear Regulatory Commission ("NRC"), and data from the study have been used in formulating § 2.5 of the FSAR.

B-24. What is the source of Table 2.4.12-7(FSAR)? On what basis are the listed aquifers identified? Were the wells compared with subsurface geologic maps?

RESPONSE: The source of Table 2.4.12-7 in the FSAR is water level measurements made in wells by the Applicants or their contractors. The sequence and depths of the different aquifers and aquicludes beneath the VEGP site were determined by site exploration as discussed in Applicant's response to interrogatory B-1 and described in §§ 2.4 and 2.5 of the PSAR and FSAR. Geologic sections showing the geology and the aquifers were developed from the data collected. These sections are shown in Figures 2.5.1-14 through 2.5.1-20 of the FSAR.

The Applicants object to the last portion of interrogatory B-24 on the ground that it is vague, confusing, and not susceptible to a proper response. Specifically, Applicants do not know to what Intervenors are referring by the term "subsurface geologic maps."

B-25. Is the reference in Table 2.4.12-7 (FSAR) to "observation wells in the marl aquiclude" correct? Why do wells drilled to an aquiclude have a large enough flow of water in them to obtain water levels that are nearly the same as levels obtained from wells drilled into the aquifers listed?

RESPONSE: Observation wells 42B and 42C are open to the marl. They were constructed in 1971 along with wells 42A

and 42D as a nest of observation wells to compare hydrostatic levels in the sand overlying the marl with levels in the sand beneath the marl. The wells were monitored for 4 years until construction of the plant required their removal, at which time they were sealed. At the location of this well nest the marl is 65 feet thick. The water levels in the observation wells reflect the hydrostatic pore pressure present in the interval the well is monitoring. The levels do not indicate the rate of water inflow to the well. The measured water levels in wells 42B and 42C are distinctly different from the levels measured in the sands immediately below and above the marl, considering their proximity to those sands.

Well 42B is open to an interval of the marl that is within 10 feet of the bottom of the marl. The water levels measured in well 42B are from 10 to 20 feet different (higher) than those measured in well 42A, which is open to the underlying sands beneath the marl and 10 feet below the interval monitored by 42B.

Well 42C is open to an interval that is at the top of the marl. The water levels measured in well 42C are 4 to 6 feet different (lower) than those measured in well 42D, which is open to the sands above the marl, less than 3 feet above the interval monitored by 42C.

These differences in hydrostatic levels are proportionately of similar magnitude to the difference in

hydrostatic levels between the overlying and underlying sands as measured in observation wells 42D and 42A, respectively. That difference is about 50 feet, with the level in the sands above the marl being higher. This difference is between sands separated by a marl thickness of 65 feet.

B-26. On page 2.4.12-10, paragraph 3, FSAR, Applicant states that the Huber Fm (Paleocence) does not constitute an effective acquiclude and the Tertiary and Cretaceous aquifers are hydraulically interconnected. Does this mean that if contaminated waters are released at the surface, groundwater contamination will result? Provide the bases for the response.

RESPONSE: The Huber Formation is located about 300 feet below land surface at the VEGP site and the water table is about 60 feet below land surface. The marl confining layer is located between the water table aquifer and the Huber Formation, and the marl would prevent any contamination present in the water table aquifer from reaching the deeper Tertiary and Cretaceous aquifers. As discussed in § 2.4.12.1.2.2 of the FSAR, the permeability of the Huber Formation will have no effect on whether or not contaminated water released at the surface will contaminate the Tertiary and Cretaceous aquifers.

B-27. What is the basis of the Applicant's statement that "the water table aquifer . . . lies largely

within the exclusion radius of the plant (Applicant's Response to GANE and CPG Supplements to Petitions for Leave to Intervene, p. 43)?

RESPONSE: Plant Vogtle is located on an interfluvial high bounded by stream channels that have cut down to or near the effectively impermeable Blue Bluff marl. This marl forms the aquiclude between the shallow water table aquifer and the deeper Tertiary and Cretaceous aquifers. The streams that act as interceptor drains for the ground water (water table aquifer) in the sands overlying the marl include the Savannah River to the northeast, the Hancock Landing draining (including Mathes Pond) to the north, tributaries of Beaverdam Creek (including Daniels Branch) to the west, and Beaverdam Creek to the south. (See FSAR Figures 2.5.1-12, 2.5.1-13, 2.5.1-14, and 2.5.1-15.) The water table aquifer beneath the VEGP site flows in the direction of and discharges into those streams. The water table aquifer beneath the plant is thus hydraulically isolated on an interfluvial high. The ground water is replenished by natural precipitation which percolates to the water table aquifer and then moves laterally to one of the interceptor streams. The interceptor streams, and thus the water table aquifer beneath and around the plant, are located largely within the exclusion radius (i.e. plant boundary or property line) of

the VEGP. (See CP-ER § 2.5.4, FSAR §§ 2.4.12.1.2.3 and 2.4.12.2.3.3, and OL-ER §§ 2.4.2.2 and 7A.4.3.)

B-28. What is the basis of the Applicant's statement that radioactive spillage "could be intercepted" in the Mathes Pond (Applicant's Response to GANE and CPG Supplements to Petitions for Leave to Intervene, p. 43)?

RESPONSE: As indicated in Applicants' response to interrogatory B-27, the streams that hydraulically isolate the water table aquifer at the VEGP site on an interfluvial high act as interceptor drains for the ground water in the sands overlying the marl beneath the plant site. See Figures 2.5.1-12, 2.5.1-13, 2.5.1-14, and 2.5.1-15 of the FSAR. As evidenced in Figure 2.4.12-7 of the FSAR, the contours of the water table aquifer indicate that water within the water table aquifer directly underneath the power block moves to the northwest in the direction of Mathes Pond. Therefore, any spillage at the plant that infiltrated the ground would move downward through the unsaturated zone to the water table aquifer. After reaching the water table aquifer it would move laterally to Mathes Pond where it would be intercepted.

B-29. What is the basis of the estimate that the time of migration of a spill to Mathes Pond would be "on the order of 350 years" (Applicant's Response to GANE and CPG Supplements to Petitions for Leave to Intervene, p. 43)?

RESPONSE: The basis of the statement is the seepage analysis of a hypothetical spill of radionuclide material described in § 2.4.13 of the FSAR.

B-30. What is the basis for the Applicant's statement that "the water table aquifer is isolated on an interfluvial high and is intercepted by Beaverdam Creek" (Applicant's Response to GANE and CPG Supplements to Petitions for Leave to Intervene, p. 44)?

RESPONSE: In response to interrogatory B-30, Applicants refer the Intervenors to and incorporate herein the Applicants' responses to interrogatories B-27 and B-28.

B-31. Discuss the withdrawal of water underlying and within twenty-five miles of Plant Vogtle and the consequences (e.g., ground water contamination rates, aquifer depletion, etc.) for the short and long term at the postulated withdrawal rates.

RESPONSE: Ground water usage at Plant Vogtle is discussed in § 2.4.12.1.3.1 and summarized in Table 2.4.12-2 of the FSAR. Construction water requirements are discussed in § 2.4.12.1.3.2 of the FSAR, and construction dewatering is discussed in § 2.4.12.1.3.3 of the FSAR. Ground water use within the region, present and projected, is discussed in §§ 2.4.12.2.1 and 2.4.12.2.2 of the FSAR and in the OL-ER in response to NRC Questions E470.4 at page QE470.4-1 and E470.5 at page QE470.5-1. A tabulation of existing off-site ground water users and a map showing the location

of the wells within a two-mile radius of the VEGP is presented in the FSAR in response to NRC Question 240.5 at page Q240.5-1. Estimates of the draw down caused by withdrawal of water from the Cretaceous acquifer by makeup wells at Plant Vogtle are presented in § 2.4.12.1.3.3 of the PSAR.

The information reflected in these sections indicates that withdrawals will be negligible in comparison to the aquifer capacity. The measurable impact beneath the site will be the lowering of head (water levels) of the Cretaceous acquifer within the pumping depression of the makeup wells during operation of the plant. The extent of the pumping depression is not expected to be significant beyond the boundaries of the site.

Applicants interpret "groundwater contamination rates" to mean the potential for a possible spill of liquid waste at the plant to reach the ground water. Withdrawal of water from the Cretaceous aquifer will not affect the probability that a fluid spilled at the site would reach the ground water. Any spill that infiltrated the ground and reached the water table aquifer would be contained within the water table aquifer beneath the site by the effectively impermeable Blue Bluff marl, discussed in Applicants' response to interrogatory B-2.

B-32. Discuss the effects of all cooling water storage on the possibility of causing radioactive hazardous ground water contamination?

RESPONSE: Cooling water storage at the VEGP is provided by the concrete basins for the natural draft cooling towers and the concrete basins for the mechanical draft ECCS cooling towers. No storage ponds or other cooling water storage facilities will be used at the VEGP. Therefore, cooling water storage will have no effect on ground water contamination.

C-1. Please produce all information relating to each well listed in Tables 2.4.12-7 of the VEGP-FSAR as well as other wells on and within twenty-five miles of the Plant Vogtle site, including:

(a) the location and type of each well;

(b) lithologic logs developed in the field or elsewhere during the drilling of each well;

(c) sampling intervals (including split spoon or shelby tube cores);

(d) depths;

(e) screened intervals;

(f) other construction details (including sand packs, plugs and grouting);

(g) any and all maps showing the location of the wells.

RESPONSE: Applicants will produce those documents in their possession or under their control that fall within the category of documents described in request to produce C-1.

C-2. Please produce all permeability data from geologic material at and within twenty-five miles of the Plant Vogtle site including

(a) method of permeability analysis; and

(b) areal and vertical location of the measured interval.

RESPONSE: Applicants will produce those documents in their possession or under their control that fall within the category of documents described in request to produce C-2.

C-3. Please produce all transmissivity data from geologic material at the Plant Vogtle site.

RESPONSE: Applicants will produce those documents in their possession or under their control that fall within the category of documents described in request to produce C-3.

C-4. Please provide copies of all tests, test results, studies, memoranda, scientific treatises and other reports or information (whether published or not) to Applicant's knowledge which tend to support, contradict or otherwise relate to any answer to the interrogatories included above.

RESPONSE: Applicants object to request to produce C-4 on the following grounds:

(1) request to produce C-4 is overly broad, unduly burdensome, and oppressive, and producing the requested documents would necessitate an unreasonable and costly expenditure of time, effort, and research by Applicants, and

(2) Applicants cannot properly respond to request to produce C-4 because the description of the category of documents sought is too vague and is susceptible to varying interpretations.

Subject to those objections, Applicants further respond to request to produce C-4 by stating that they will produce for inspection and copying by the Intervenors any documents referenced in their responses to interrogatories B-1 through B-32 that have not been produced in response to requests to produce C-1 through C-3.

D-1. What tests of the TDI generators will be performed by the Applicant, and at what power levels, before Plant Vogtle comes on line?

RESPONSE: The operational tests of the Transamerica Delaval, Inc. ("TDI") diesel generators that will be performed before Plant Vogtle Unit 1 begins commercial operation will be delineated in Applicants' Pre-Op Procedure 1-3KJ-01 Rev.0 when that procedure is issued. The present schedule for issuance of this Pre-Op Procedure is January

1985. A draft of this Pre-Op Procedure, designated 1-3KJ-01 Rev.B, has been prepared and is presently being reviewed. A copy of that draft will be produced for inspection and copying by the Intervenors. Applicants emphasize, however, that that draft of the Procedure and the operational tests outlined in it may be modified or otherwise changed prior to issuance of Pre-Op Procedure 1-3KJ-01 Rev.0 in January 1985.

D-2. What will the testing schedule for the generators be during operation of Plant Vogtle?

RESPONSE: Operational testing of the TDI diesel generators after Plant Vogtle Unit 1 begins commercial operation will be conducted in accordance with VEGP procedures that are currently being developed. These procedures will be based on NUREG 0452, Rev.4 "Standard Technical Specifications for Westinghouse Pressurized Water Reactors," input from the TDI Diesel Generator Owners' Group, and review by the Applicants. The specific testing schedule that will be followed has not yet been determined.

D-3. What actions has the Applicant taken to prevent problems with its TDI generators in the following areas: Piston crown separation; piston skirt cracks; fuel line failures/fire; cylinder head cracks; turbocharger problems; push rod cracks; generator short due to engine fastener failure; air starting valve problems; jacket water pump problems; fuel oil lines rupturing; crankshaft

failures; connecting rod bearing failures; fastener failures; excessive bearing wear; cracks in push rod welds; cracks in connecting rods; and cylinder blocks?

RESPONSE: The Applicants have developed a TDI Emergency Diesel Generator Resolution Program to prevent problems in the referenced areas and enhance the reliability of the TDI diesel generators. This Program is delineated in the Vogtle Electric Generating Plant Project Policy and Procedures Manual, Appendix 6. Under the Program, which involves TDI as a consultant and Georgia Power and Bechtel QA/QC disciplines, each diesel generator has been or will be disassembled, inspected, modified or repaired as necessary, and reassembled.

The application of the Program to the TDI diesel generators for Unit 1 is documented in a twelve (12) volume report that was transmitted to the TDI Owners Group by letter LSV-NS1484, dated October 17, 1984. This report includes documentation of inspection, non-destructive examination testing, and modifications of the referenced components other than fuel lines. With respect to fuel lines, fuel oil lines with a shrouded design to enable detection of any leaks that might occur have been ordered and will be installed on the diesel generators at Plant Vogtle. Applicants have also reviewed and evaluated design review reports on the referenced components for applicability to the VEGP diesel generators.

Georgia Power is, and has been, a member of the TDI Diesel Generator Owners' Group. The Owners' Group has met in the past and will continue to meet with representatives of the NRC pursuant to a program to establish the reliability of TDI diesel generators. Applicants expect the Owners' Group to provide them with a "Design Review Quality Revalidation Report" specific to the VEGP diesel generators in January 1985.

In addition to the foregoing, Applicants will develop and implement a planned maintenance, inspection, and surveillance program applicable to the diesel generators during operation of Plant Vogtle. While this program and its scope have not yet been developed, it will be based in part on the results of the above described actions.

E-1. Please provide a copy of the Applicant's response to all questions from the NRC staff regarding Transamerica Delaval, Inc. ("TDI") generators, including but not limited to questions asked with the letter from Elinor G. Adensam, Branch Chief, Licensing Branch 4, to Mr. Donald Foster, Vice President and General Manager for Georgia Power, dated December 29, 1983.

RESPONSE: Applicants will produce those documents in their possession or under their control that fall within the category of documents described in request to produce E-1.

E-2. Please provide copies of any reports, memoranda, letters or other materials between the Applicant and TDI concerning the adequacy of the TDI generators.

RESPONSE: Applicants will produce those documents in their possession or under their control that fall within the category of documents described in request to produce E-2.

E-3. Please provide all copies of all meeting notices, meeting transcripts, meeting minutes and correspondence between the TDI Owners' Group and the Applicant, the TDI Owners' Group and the NRC staff, and between the Applicant and the NRC staff.

RESPONSE: Applicants will produce those documents in their possession or under their control that fall within the category of documents described in request to produce E-3.

E-4. Please provide copies of all QA/QC reports in the Applicant's possession concerning the TDI generators.

RESPONSE: Applicants will produce those documents in their possession or under their control that fall within the category of documents described in request to produce E-4.

E-5. Please provide any information in the Applicant's possession concerning starting problems with TDI generators.

RESPONSE: Applicants will produce those documents in their possession or under their control that fall within the category of documents described in request to produce E-5.

E-6. Please provide copies of all tests, test results, studies, memoranda, scientific treatises and other reports or information (whether published or not) to Applicant's knowledge which tend to support, contradict or otherwise relate to the interrogatories included above.

RESPONSE: Applicants object to request to produce E-6 on the following grounds:

(1) request to produce E-6 is overly broad, unduly burdensome, and oppressive, and producing the requested documents would necessitate an unreasonable and costly expenditure of time, effort, and research by Applicants, and

(2) Applicants cannot properly respond to request to produce E-6 because the description of the category of documents sought is too vague and is susceptible to varying interpretations.

Subject to those objections, Applicants further respond to request to produce E-6 by stating that they will produce for inspection and copying by the Intervenors any documents referenced in their responses to interrogatories D-1 through D-3 that have not been produced in response to requests to produce E-1 through E-5.

F-1. What are the dose rates that have actually been used in the Applicant's testing program?

RESPONSE: The dose rates utilized in the environmental qualification of safety related equipment for Plant Vogtle have varied depending upon the particular piece of equipment being qualification tested. Applicants are having prepared a list that will identify the polymer materials contained in safety related equipment at Plant Vogtle that will be exposed for the normally expected radiation environment over the installed life of the equipment to a total integrated radiation dose of at least 10,000 (1×10^4) rads. To the extent that Applicants or its contractors Bechtel and Westinghouse have information concerning the dose rates used in the qualification tests for that equipment, that information will be reflected on the list. Applicants will provide this list to the Intervenors once it has been completed.

F-2. Are these dose rates considered normal rates for equipment under standard operating conditions?

RESPONSE: No.

F-3. (a) What does rates would be encountered under accident conditions?

(b) What are the assumptions for this design basis accident?

RESPONSE: (a) The average dose rates postulated to be encountered under post design basis accident ("DBA") conditions are shown on Table 1 for equipment located within the reactor containment building at VEGP and on Table 2 for equipment located outside the reactor containment building, which could be affected by the recirculation of post-accident fluids.

TABLE 1

Average Post DBA Radiation Dose Rates Inside Reactor Containment

Time Period	Average Dose Rate
0.0 - 4.0 hours	3.25×10^6 rad/hr
4.0 hours - 1 day	1.03×10^6 rad/hr
1 - 30 days	1.52×10^5 rad/hr
30 - 300 days	1.54×10^3 rad/hr

TABLE 2

Maximum Post DBA Radiation Dose Rates for Affected Areas Outside Reactor Containment

Elapsed Time Period	Dose Rate
8 hours	3.0×10^5 rad/hr
1 day	9.2×10^4 rad/hr
30 days	6.0×10^3 rad/hr
300 days	8.3×10^2 rad/hr

(b) The assumptions used for the calculation of post loss of coolant accident equipment dose rates are in accordance with the guidance provided by:

(1) NUREG-0578, Section 2.1.6.8

(2) NUREG-0737, Section II.B.2

(3) USNRC Regulatory Guides 1.4, Revision 2 and 1.7, Revision 2

(4) AEC Technical Information Document 14844.

These assumptions include the postulated release of the following fractions of the core's inventory:

(1) 100% Noble gasses

(2) 50% Halogens

(3) 1% All other isotopes.

F-4. How did the Applicant determine what dose rate(s) should be used for qualification of equipment?
RESPONSE: The Applicants do not specify dose rates to be used for qualification of equipment. Radiation aging rates used for qualification of safety related equipment are determined by equipment suppliers based upon the appropriate qualification standards and in some instances Applicants' procurement specifications. The Applicants review each qualification program to assure consistency with the appropriate qualification standard.

F-5. How did the Applicant determine which equipment should be tested at different dose rates?
RESPONSE: The Applicants have not specified that the same equipment be tested at multiple dose rates. Determination of which equipment should be radiation aged at different

rates is made by suppliers of safety related equipment based on the Applicants' procurement specifications and conditions. Applicants require that suppliers of safety related equipment qualify equipment to the combined integrated radiation dose for the normally expected radiation environment over the equipment's installed life, plus that associated with the most severe design basis event. Following exposure to that total integrated dose, the equipment is required to remain functional.

F-6. Does the Applicant anticipate any major changes that would affect testing in this area? If so, describe these changes.

RESPONSE: No.

F-7. (a) What is the derivation of the list of equipment that includes material expected to be subject to dose rate effects as outlined in NUREG/CR-2157? Justify that this list is complete and does not overlook any safety related equipment.

(b) Are all of these components being tested or planned to be tested for dose rate effect? If not, provide an explanation for the Applicant's failure to test.

RESPONSE: (a) Applicants do not expect any safety related equipment at Plant Vogtle to be subject to dose rate effects under the conditions to which that equipment will be exposed during the normal operation of the plant. As indicated in their response to interrogatory F-1,

Applicants are having prepared a list that will identify the polymer materials contained in safety related equipment at Plant Vogtle that will be exposed for the normally expected radiation environment over the installed life of the equipment to a total integrated radiation dose of at least 10,000 (1×10^4) rads. Applicants will provide this list to the Intervenors once it has been completed.

(b) No dose rate testing is planned for safety related equipment used at Plant Vogtle, because it has not been established that dose rate effects will be significant for any such equipment at Plant Vogtle at the total integrated radiation dose to which that equipment will be exposed over its installed life.

G-1. Supply a list of all equipment that include material expected to be subject to dose rate effects, as outlined in NUREG/CR-2157.

RESPONSE: Applicants do not expect any safety related equipment at Plant Vogtle to be subject to dose rate effects under the conditions to which that equipment will be exposed during the normal operation of the plant. As indicated in their response to interrogatory F-1, Applicants are having prepared a list that will identify the polymer materials contained in safety related equipment at Plant Vogtle that will be exposed for the normally expected radiation environment over the installed

life of the equipment to a total integrated radiation dose of at least 10,000 (1×10^4) rads. Applicants will provide this list to the Intervenors once it has been completed.

G-2. Please provide copies of all tests, test results, studies, memoranda, scientific treatises and other reports or information (whether published or not) which to Applicant's knowledge tend to support, contradict or otherwise relate to any answer to the interrogatories included above.

RESPONSE: Applicants object to request to produce G-2 on the following grounds:

(1) request to produce G-2 is overly broad, unduly burdensome, and oppressive, and producing the requested documents would necessitate an unreasonable and costly expenditure of time, effort, and research by Applicants, and

(2) Applicants cannot properly respond to request to produce G-2 because the description of the category of documents sought is too vague and is susceptible to varying interpretations.

Subject to those objections, Applicants further respond to request to produce G-2 by stating that they will produce for inspection and copying by the Intervenors any documents referenced in their responses to interrogatories F-1 through F-7. Applicants further note that the

list described in their responses to interrogatories F-1 and F-7(a) will be derived from documents relating to the environmental qualification of particular items of the safety related equipment at Plant Vogtle. These documents are voluminous, and it would impose an undue and oppressive burden upon the Applicants to produce all such documents. If, however, the Intervenors want to inspect the environmental qualification packages for a limited number of specific items of safety related equipment, the Applicants will endeavor to produce those documents.

H-1. What are the detailed conditions used in synergistic testing of cables?

RESPONSE: Applicants object to interrogatory H-1 on the following grounds:

(1) interrogatory H-1 seeks information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory H-1 requests information outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, since the Board did not admit subcontention 10.2 for litigation in this proceeding.

H-2. Are these conditions considered to simulate normal or accident parameters?

RESPONSE: Applicants object to interrogatory H-2 on the following grounds:

(1) interrogatory H-2 seeks information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory H-2 requests information outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, since the Board did not admit subcontention 10.2 for litigation in this proceeding.

H-3. Explain why these conditions were chosen and cite all studies that were considered (internal and external).

RESPONSE: Applicants object to interrogatory H-3 on the following grounds:

(1) interrogatory H-3 seeks information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory H-3 requests information outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held

Pursuant to 10 C.F.R. 2.715a, since the Board did not admit subcontention 10.2 for litigation in this proceeding.

H-4. In this analysis of synergistic effects, have all variables that normally affect the aging of materials, e.g. heat, humidity, light, radiation (of all expected types), atmospheric composition, etc., been considered? Cite all relevant studies and justify why any variables were either not studied or eliminated from consideration.

RESPONSE: Applicants object to interrogatory H-4 on the following grounds:

(1) interrogatory H-4 seeks information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory H-4 requests information outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, since the Board did not admit subcontention 10.2 for litigation in this proceeding.

H-5. Since other equipment besides cable that contain PE or PVC would be expected to be susceptible to synergism, have they all been tested in this program? If not, please list the equipment that has not been tested and provide an explanation for Applicant's failure to test.

RESPONSE: Applicants object to interrogatory H-5 on the following grounds:

(1) interrogatory H-5 seeks information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory H-5 requests information outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, since the Board did not admit subcontention 10.2 for litigation in this proceeding.

I-1. Provide a list of all components besides cables expected to be susceptible to synergism.

RESPONSE: Applicants object to request to produce I-1 on the following grounds:

(1) request to produce I-1 seeks documents that are not relevant to the subject matter of this proceeding and that are not reasonably calculated to lead to the discovery of admissible evidence, and

(2) request to produce I-1 requests documents relating to matters outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a,

since the Board did not admit subcontention 10.2 for litigation in this proceeding.

I-2. Please provide copies of all tests, test results, studies, memoranda, scientific treatises and other reports or information (whether published or not) which to Applicant's knowledge tend to support, contradict or otherwise relate to any answer to the interrogatories included above.

RESPONSE: Applicants object to request to produce I-2 on the following grounds:

(1) request to produce I-2 seeks documents that are not relevant to the subject matter of this proceeding and that are not reasonably calculated to lead to the discovery of admissible evidence,

(2) request to produce I-2 requests documents relating to matters outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, since the Board did not admit subcontention 10.2 for litigation in this proceeding,

(3) request to produce I-2 is overly broad, unduly burdensome, and oppressive, and

(4) Applicants cannot properly respond to request to produce I-2 because the description of the

category of documents sought is too vague and is susceptible to varying interpretations.

J-1. Give a full and complete analysis of the Applicant's program to study the performance of EPR cable material.

RESPONSE: Applicants object to interrogatory J-1 on the following grounds:

(1) interrogatory J-1 asks for information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory J-1 seeks information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a.

Subject to those objections, Applicants state in further response to interrogatory J-1 that the Sandia study upon which Intervenors based subcontention 10.3, which is Sandia 83-1258, NUREG/CR-3538, and which is entitled "The Effect of LOCA Simulation Procedures on Ethylene Propylene Rubber's Mechanical and Electrical Properties," identified only one type of multiconductor cable that showed greater degradation than single conductor cable, which was a multiconductor cable manufactured by Anaconda

Wire and Cable Co. that had EPR insulation and a chlorinated polyethylene jacket. No other type of cable has been found to suffer greater degradation in multiconductor configurations than in a single conductor configuration. A subsequent Sandia study, which is Sandia 83-2406, NUREG/CR-3588, and which is entitled "The Effect of LOCA Simulation Procedures on Cross-Linked Polyolefin Cable's Performance," found no significant differences in degradation of insulation materials between tests of the cables samples in single conductor configurations and tests in multiconductor configurations.

The particular multiconductor cable material found to show greater degradation than single conductor cable by the Sandia National Laboratories has not been used in any safety related equipment at Plant Vogtle. Therefore, with respect to the EPR cable material used in Plant Vogtle, qualification testing of a single conductor cable configuration would be adequate.

J-2. How does this take into account cable with single/multiconductor configurations?

RESPONSE: Applicants object to interrogatory J-2 on the following grounds:

(1) interrogatory J-2 asks for information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory J-2 seeks information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a.

Subject to those objections, Applicants further respond to interrogatory J-2 by referring Intervenors to and incorporating herein their response to interrogatory J-1.

J-3. (a) Are samples from every batch or production run of cable tested?

(b) What are the Applicant's sampling methods? How are these justified?

(c) How many samples of cable have already been tested?

RESPONSE: Applicants object to interrogatory J-3 on the following grounds:

(1) interrogatory J-3 asks for information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory J-3 seeks information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a.

Subject to those objections, Applicants further respond to interrogatory J-3 by referring Intervenors to and incorporating herein their response to interrogatory J-1.

K-1. Please provide copies of all tests, test results, studies, memoranda, scientific treatises and other reports or information (whether published or not) which to Applicant's knowledge tend to support, contradict or otherwise relate to any answer to the interrogatories included above.

RESPONSE: Applicants object to request to produce K-1 on the following grounds:

(1) request to produce K-1 is overly broad, unduly burdensome, and oppressive, and producing the requested documents would necessitate an unreasonable and costly expenditure of time, effort, and research by Applicants, and

(2) Applicants cannot properly respond to request to produce K-1 because the description of the category of documents sought is too vague and is susceptible to varying interpretations.

Subject to those objections, Applicants further respond to request to produce K-1 by stating that they will produce for inspection and copying by the Intervenors any documents referenced in their responses to interrogatories J-1 through J-3.

L-1. (a) Under what conditions were solenoid valves tested for environmental qualification, and what results were obtained?

(b) Do these conditions represent normal or accident conditions?

(c) Justify why these conditions and testing results are adequate to insure the safety of the plant (e.g. how long will accident conditions exist and the basis for this assumption).

RESPONSE: Applicants object to interrogatory L-1 on the following grounds:

(1) interrogatory L-1 calls for information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory L-1 requests information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a. The Intervenors premised subcontention 10.5 upon and the Board admitted that subcontention on the basis of a Franklin Research Center test in which certain solenoid valves manufactured by Automatic Switch Co. ("ASCO") failed to perform after exposure to high temperatures. Interrogatory L-1 does

not, however, limit the information sought to ASCO solenoid valves.

(3) Interrogatory L-1 seeks information that is confidential and proprietary in nature.

Subject to those objections, Applicants provide the following response to interrogatory L-1:

(a) ASCO solenoid valves utilized in safety related equipment at Plant Vogtle were qualification tested by both Westinghouse Electric Corporation and ASCO. The conditions under which the valves were tested by Westinghouse can be determined from WCAP 8587, Supplement 1 (Non-Proprietary), Equipment Qualification Data Package HE-2/5 Revision 4, March 1983 and WCAP 8687, Supplement 2 (Proprietary), Equipment Qualification Test Report HO2A/5A Revision 2, March 1983. The test conditions utilized by ASCO are set out in AQS-21678/TR, Revision A (Proprietary) and AQR-67368, Revision 1 (Proprietary). These reports will be produced for inspection and copying by Intervenors provided that agreements protecting any proprietary information in these reports from disclosure suitable to all parties can be entered into between Westinghouse and the Intervenors and ASCO and the Intervenors.

(b) Accident conditions.

(c) Various accident scenarios are analyzed for Plant Vogtle in Chapters 6 and 15 of the FSAR. The worst

case environment inside containment with respect to peak temperature determined by these analyses is used to determine the conditions to which the ASCO solenoid valves must be qualified. Heat transfer analysis performed for the worst case environment inside containment at Plant Vogtle demonstrates that the temperature reached by any of the ASCO solenoid valves inside containment will not exceed the maximum temperature to which the valves were qualified under either the ASCO or the Westinghouse test programs referenced in Applicants' response to part (a) of this interrogatory.

L-2. When environmentally qualified valves are obtained, what type of maintenance and surveillance program will be used to insure that these valves remain qualified throughout the life of the plant?

RESPONSE: Applicants object to interrogatory L-2 on the following grounds:

(1) interrogatory L-2 calls for information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory L-2 requests information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a. The Intervenors premised

subcontention 10.5 upon and the Board admitted that subcontention on the basis of a Franklin Research Center test in which certain solenoid valves manufactured by ASCO failed to perform after exposure to high temperatures. Interrogatory L-2 does not, however, limit the information sought to ASCO solenoid valves.

Subject to those objections, Applicants respond further to interrogatory L-2 by stating that the Applicants have not at this time developed a maintenance and surveillance program applicable to the ASCO solenoid valves in safety related equipment, although such a program will be established prior to Plant Vogtle becoming operational.

L-3. Has the testing program taken into account the physical orientation of all of the solenoid valves that must be qualified?

RESPONSE: Applicants object to interrogatory L-3 on the following grounds:

(1) interrogatory L-3 calls for information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory L-2 requests information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a. The Intervenors premised

subcontention 10.5 upon and the Board admitted that subcontention on the basis of a Franklin Research Center test in which certain valves manufactured by ASCO failed to perform after exposure to high temperatures. Interrogatory L-3 does not, however, limit the information sought to ASCO solenoid valves.

Subject to those objections, Applicants state in further response to interrogatory L-3 that the ASCO solenoid valves are designed to operate in any configuration. The only interface requirement for qualification is that the solenoid enclosure be sealed.

L-4. (a) If physical orientation has been considered, describe the testing program that provided this information.

(b) If physical orientation has not been considered, justify why this important variable has been eliminated.

RESPONSE: Applicants object to interrogatory L-4 on the following grounds:

(1) interrogatory L-4 calls for information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory L-4 requests information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its

Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a. The Intervenors premised subcontention 10.5 upon and the Board admitted that subcontention on the basis of a Franklin Research Center test in which certain valves manufactured by ASCO failed to perform after exposure to high temperatures. Interrogatory L-4 does not, however, limit the information sought to ASCO solenoid valves.

Subject to those objections, Applicants state in further response to interrogatory L-4 that the ASCO solenoid valves are designed to operate in any configuration. The only interface requirement for qualification is that the solenoid enclosure be sealed.

M-1. Provide a list (model number and location in plant) of all solenoid valves that should be environmentally qualified.

RESPONSE: Applicants object to request to produce M-1 on the following grounds:

(1) request to produce M-1 requests documents that are not relevant to the subject matter of this proceeding and that are not reasonably calculated to lead to the discovery of admissible evidence, and

(2) request to produce M-1 calls for documents that are outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference

Held Pursuant to 10 C.F.R. 2.715a. The Intervenors predicated subcontention 10.5 upon and the Board admitted that subcontention on the basis of a Franklin Research Center test in which certain valves manufactured by ASCO failed to perform after exposure to high temperatures. Request to produce M1, however, requests documents about valves other than just the ASCO solenoid valves that failed in the Franklin Research Center test.

Subject to those objections, Applicants state that they are having prepared a list of all ASCO solenoid valves used in safety related equipment at Plant Vogtle that will identify each such valve by model number and will list its location in the plant. Once this list has been completed, it will be provided to the Intervenors.

M-2. Please provide copies of all tests, test results, studies, memoranda, scientific treatises and other reports or information (whether published or not) which to Applicant's knowledge tend to support, contradict or otherwise relate to any answer to the interrogatories included above.

RESPONSE: Applicants object to request to produce M-2 on the following grounds:

(1) request to produce M-2 is overly broad, unduly burdensome, and oppressive, and producing the requested documents would necessitate an unreasonable and

costly expenditure of time, effort, and research by Applicants, and

(2) Applicants cannot properly respond to request to produce M-2 because the description of the category of documents sought is too vague and is susceptible to varying interpretations.

Subject to those objections, Applicants state in further response to request to produce M-2 that they will produce for inspection and copying by the Intervenors any documents referenced in their responses to interrogatories L-1 through L-4 that have not been produced in response to request to produce M-1.

N-1. (a) Are there any types of transducers or sensors important to the proper functioning of the Plant Vogtle electric type hydrogen recombiner in an accident environment that require environmental qualification testing?

(b) If so, what testing is planned or completed and with what results?

RESPONSE: The electric hydrogen recombiner system utilized at Plant Vogtle is a natural convection, flameless, thermal reactor type hydrogen recombiner that heats a continuous stream of air mixed with hydrogen to a temperature sufficient for spontaneous recombination of the hydrogen with oxygen to form water. The hydrogen recombiner units used at Plant Vogtle contain no transducers or sensors

that are important to their functioning. The hydrogen recombiner units at Plant Vogtle do not monitor in any way the level of hydrogen inside containment. That function is performed by a completely separate containment hydrogen monitoring system, as described in § 6.2.5.2.4 of the FSAR.

While the hydrogen recombiner unit does contain a thermocouple system, that system is provided only as a convenient means of measuring the temperature of the heater element of the unit. The thermocouple system does not activate the operation of the hydrogen recombiner units, nor is it required for monitoring proper operation of the units. The operation of the unit would not be affected in any way by a failure of the thermocouple system. Proper operation of the hydrogen recombiner units requires only manual actuation of power delivery to the heater banks.

N-2. (a) If environmental qualification testing in an accident environment of an entire prototype recombiner is not required, what is the basis for this conclusion?

(b) If such testing is planned or has been completed, what is the nature of the test and what criteria exist for assessing the adequacy of the test results?

RESPONSE: Applicants object to interrogatory N-2 to the extent that it seeks information that is confidential or proprietary in nature concerning the qualification testing

of the Westinghouse hydrogen recombiner units utilized at Plant Vogtle.

Subject to that objection, Applicants state in further response to interrogatory N-2 that each of the hydrogen recombiner units at Plant Vogtle consists of three basic parts: (1) a heating unit consisting of electric heaters in a ceramic shell, which is located inside the containment building; (2) a power supply located outside containment; and (3) a control panel located outside containment. Because only the heating unit is inside the containment building, only that part of the hydrogen recombiner has been subjected to an accident environment in qualification testing.

WCAP-7709L and its supplements 1-7 (proprietary), and WCAP-7820 and its supplements 1-7 (nonproprietary) document the qualification testing of hydrogen recombiner units of the type used at Plant Vogtle. This testing was conducted on the Westinghouse Model A Hydrogen Recombiner. Westinghouse subsequently redesigned this model to incorporate several improvements. The redesigned hydrogen recombiner is the Westinghouse Model B Hydrogen Recombiner employed at Plant Vogtle. No changes were made in the design that would have affected qualification. WCAP-9346 discusses the design changes between the Model A and Model B recombiners and the testing performed to verify their design. Copies of these reports will be produced for

inspection and copying by the Intervenors provided an agreement can be reached suitable to all parties between Westinghouse and the Intervenors protecting from disclosure any confidential or proprietary information contained in those reports.

N-3. If such testing of either the entire recombiner or its components does not include post-LOCA steam and spray exposure, justify this lack of testing.

RESPONSE: The qualification testing performed on the hydrogen recombiners is described in the reports referenced by Applicants in their response to interrogatory N-2, and it included the effects of post-LOCA steam and spray exposure.

N-4. What is the operating experience with this type of recombiner in other plants?

RESPONSE: Applicants object to interrogatory N-4 on the following grounds:

(1) interrogatory N-4 seeks information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory N-4 asks for information beyond the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a.

N-5. Give a full and complete analysis of how this recombiner (the whole system) will avoid the problems encountered during the accident at Three Mile Island in which the recombiner system could not be used.

RESPONSE: Applicants object to interrogatory N-5 on the following grounds:

(1) interrogatory N-5 seeks information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory N-5 asks for information beyond the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a.

N-6. What type of maintenance and surveillance program will be used to insure that the recombiners will remain qualified throughout the life of the plant?

RESPONSE: Applicants object to interrogatory N-6 on the following grounds:

(1) interrogatory N-6 seeks information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence; and

(2) interrogatory N-6 asks for information beyond the scope of those matters identified as being in

controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a.

O-1. Please provide copies of all tests, test results, studies, memoranda, scientific treatises and other reports or information (whether published or not) which to Applicant's knowledge tend to support, contradict or otherwise relate to any answer to the interrogatories included above.

RESPONSE: Applicants object to request to produce O-1 on the following grounds:

(1) request to produce O-1 is overly broad, unduly burdensome, and oppressive, and producing the requested documents would necessitate an unreasonable and costly expenditure of time, effort, and research by Applicants, and

(2) Applicants cannot properly respond to request to produce O-1 because the description of the category of documents sought is too vague and is susceptible to varying interpretations.

Subject to those objections, Applicants further respond to request to produce O-1 by stating that they will produce for inspection and copying by the Intervenors any documents referenced in their responses to interrogatories N-1 through N-3.

P-1. Give a full and complete analysis of how the steam generators to be installed at Plant Vogtle will avoid the problems seen in other Westinghouse steam generators in regards to tube failures caused by vibration-induced fatigue cracking and by bubble collapse.

RESPONSE: Tube failures resulting from vibration-induced fatigue cracking or bubble collapse have not been observed in any Westinghouse designed steam generators. This statement is based upon historical experience from 97 plants that have operated between one and twenty-five years and that utilize various model Westinghouse steam generators, including feed-ring type units.

P-2. Give a full and complete analysis of how the all volatile treatment ("AVT") will eliminate the problems seen in other Westinghouse steam generators with regards to general corrosion, stress corrosion cracking, denting and tube thinning. This analysis will include, but not necessarily be limited to: all relevant studies; a summary of all important empirical data; a statement of the conditions under which the AVT is effective and conditions under which it is not effective; an explanation of how conditions at Plant Vogtle will be controlled so the AVT will be effective for the life of the plant.

RESPONSE: Applicants object to interrogatory P-2 on the following grounds:

(1) interrogatory P-2 requests information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory P-2 seeks information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, which restricted contention 11 to issues related to "steam generator tube failures occasioned by vibration-induced fatigue cracking and by bubble collapse."

P-3. Give a full and complete analysis of the Applicant's maintenance and surveillance program in regards to the Westinghouse steam generator.

RESPONSE: Applicants object to interrogatory P-3 on the following grounds:

(1) interrogatory P-3 requests information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory P-3 seeks information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, which restricted contention

11 to issues related to "steam generator tube failures occasioned by vibration-induced fatigue cracking and by bubble collapse."

P-4. Justify the procedures stated in the current Operators Manual for Emergency Action during a steam generator tube rupture ("SGTR"), using technical reports and any other information you have available.

RESPONSE: Applicants object to interrogatory P-4 on the following grounds:

(1) interrogatory P-4 requests information t at is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory P-4 seeks information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, which restricted contention 11 to issues related to "steam generator tube failures occasioned by vibration-induced fatigue cracking and by bubble collapse."

P-5. Under what conditions would a SGTR accident cause activation of the ECCS? What additional problem would this cause in the management of the SGTR accident?

RESPONSE: Applicants object to interrogatory P-5 on the following grounds:

(1) interrogatory P-5 requests information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory P-5 seeks information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, which restricted contention 11 to issues related to "steam generator tube failures occasioned by vibration-induced fatigue cracking and by bubble collapse."

P-6. Based on several different levels of severity including the most severe case, what would be the expected consequences of a SGTR accident? Give details of all of the assumptions made, and include a worst case analysis.

RESPONSE: Applicants object to interrogatory P-6 on the following grounds:

(1) interrogatory P-6 requests information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory P-6 seeks information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its

Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, which restricted contention 11 to issues related to "steam generator tube failures occasioned by vibration-induced fatigue cracking and by bubble collapse."

P-7. How many Westinghouse steam generators have experienced significant degradation of tubes resulting in tube leaks?

RESPONSE: Applicants object to interrogatory P-7 on the following grounds:

(1) interrogatory P-7 requests information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory P-7 seeks information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, which restricted contention 11 to issues related to "steam generator tube failures occasioned by vibration-induced fatigue cracking and by bubble collapse."

In further response to interrogatory P-7, Applicants state that no tube failures resulting from vibration-induced fatigue cracking or bubble collapse have been observed in any Westinghouse designed steam generators.

P-8. Identify each reactor employing Westinghouse steam generators which has experienced tube leaks.

RESPONSE: Applicants object to interrogatory P-8 on the following grounds:

(1) interrogatory -8 requests information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory P-8 seeks information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, which restricted contention 11 to issues related to "steam generator tube failures occasioned by vibration-induced fatigue cracking and by bubble collapse."

In further response to interrogatory P-8, Applicants state that no tube failures resulting from vibration-induced fatigue cracking or bubble collapse have been observed in any Westinghouse designed steam generators.

P-9. What data does the Applicant possess on the frequency and severity of tube leaks in reactors equipped with Westinghouse steam generators?

RESPONSE: Applicants object to interrogatory P-9 on the following grounds:

(1) interrogatory P-9 requests information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory P-9 seeks information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, which restricted contention 11 to issues related to "steam generator tube failures occasioned by vibration-induced fatigue cracking and by bubble collapse."

In further response to interrogatory P-9, Applicants state that no tube failures resulting from vibration-induced fatigue cracking or bubble collapse have been observed in any Westinghouse designed steam generators.

P-10. What are the bases for the Applicant's responses to 7 through 9 above?

RESPONSE: In response to interrogatory P-10, Applicants refer Intervenors to and incorporate herein their response to interrogatory P-1.

P-11. How many tube ruptures have occurred at reactors employing Westinghouse steam generators?

RESPONSE: Applicants object to interrogatory P-11 on the following grounds:

(1) interrogatory P-11 requests information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory P-11 seeks information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, which restricted contention 11 to issues related to "steam generator tube failures occasioned by vibration-induced fatigue cracking and by bubble collapse."

In further response to interrogatory P-11, Applicants state that no tube failures resulting from vibration-induced fatigue cracking or bubble collapse have been observed in any Westinghouse designed steam generators.

P-12. At which reactors employing Westinghouse steam generators have (a) steam generator tubes been plugged; (b) steam generator tubes been sleeved; or (c) lower steam generator assemblies been replaced?

RESPONSE: Applicants object to interrogatory P-12 on the following grounds:

(1) interrogatory P-12 requests information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory P-12 seeks information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, which restricted contention 11 to issues related to "steam generator tube failures occasioned by vibration-induced fatigue cracking and by bubble collapse."

In further response to interrogatory P-12, Applicants state that no tube failures resulting from vibration-induced fatigue cracking or bubble collapse have been observed in any Westinghouse designed steam generators.

P-13. Identify any additional reactors employing Westinghouse steam generators where the operators or owners anticipate (a) plugging steam generator tubes; (b) sleeving steam generator tubes; or (c) replacing the lower steam generator assemblies.

RESPONSE: Applicants object to interrogatory P-13 on the following grounds:

(1) interrogatory P-13 requests information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory P-13 seeks information that is outside the scope of those matters identified as being in

controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, which restricted contention 11 to issues related to "steam generator tube failures occasioned by vibration-induced fatigue cracking and by bubble collapse."

In further response to interrogatory P-13, Applicants state that no tube failures resulting from vibration-induced fatigue cracking or bubble collapse have been observed in any Westinghouse designed steam generators.

P-14. What are the Applicant's bases for the responses to 11 through 13 above?

RESPONSE: Applicants respond to interrogatory P-14 by referring Intervenors to and incorporating herein their response to interrogatory P-1.

P-15.(a) Is Applicant aware of any litigation in which its supplier Westinghouse is involved in which it has been alleged that there have been defects or deficiencies in the design, manufacture or operation of Westinghouse steam generators?

(b) Please identify each such litigation, the parties involved and the allegations made.

RESPONSE: Applicants object to interrogatory P-15 on the following grounds:

(1) Interrogatory P-15 requests information that is not relevant to the subject matter of this proceeding

and that is not reasonably calculated to lead to the discovery of admissible evidence, and

(2) interrogatory P-15 seeks information that is outside the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, which restricted contention 11 to issues related to "steam generator tube failures occasioned by vibration-induced fatigue cracking and by bubble collapse."

Subject to those objections, Applicants state that Westinghouse is not involved in any litigation in which the allegation has been made that a Westinghouse designed steam generator suffered tube failures as a result of vibration-induced fatigue cracking or bubble collapse.

Q-1. Provide copies of the current and all previous revisions of the Operators Manual for Emergency Action during a steam generator tube rupture accident.

RESPONSE: Applicants object to request to produce Q-1 on the following grounds:

(1) request to produce Q-1 asks for documents that are not relevant to the subject matter of this proceeding and that are not reasonably calculated to lead to the discovery of admissible evidence, and

(2) request to produce Q-1 calls for documents outside the scope of those matters identified as being in

controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, which restricted contention 11 to issues related to "steam generator tube failures occasioned by vibration-induced fatigue cracking and by bubble collapse."

Q-2. Please provide copies of all tests, test results, studies, memoranda, scientific treatises and other reports or information (whether published or not) which to Applicant's knowledge tend to support, contradict or otherwise relate to any answer to the interrogatories included above.

RESPONSE: Applicants object to request to produce Q-2 on the following grounds:

(1) request to produce Q-2 is overly broad, unduly burdensome, and oppressive, and producing the requested documents would necessitate an unreasonable and costly expenditure of time, effort, and research by Applicants, and

(2) Applicants cannot properly respond to request to produce Q-2 because the description of the category of documents sought is too vague and is susceptible to varying interpretations.

R-1. Give a complete and detailed analysis of how a salt drift rate of 305 lb/acre/year was estimated in the CP-FSAR, and salts drift rates of 31 and 21 lb/acre/year

were estimated in the OL-ER. What models, equations and data are used in the new and old calculations of salt drift emissions?

RESPONSE: Part B of Attachment 3 to the September 25, 1984, letter from Mr. Foster of Georgia Power Company to Mr. Denton of the NRC describes how the estimated deposition rate of 305 lb/acre/year stated in the CP-ER was calculated. The Applicants' response to NRC Question E451.17 in Amendment 1 of the OL-ER, dated February 1984, initially provided the estimated salt drift deposition rates of 31 lb/acre/year and 21 lb/acre/year for maximum on-site and off-site deposition. The Applicants' response to NRC Question E290.8 in Amendment 3 of the OL-ER, dated May 1984, reported the Applicants' current estimates of maximum salt deposition rates of 17 lbs/acre/year on site and 15 lbs/acre/year off site.

The methodology used to calculate the last two sets of estimates was the same and is also described in Attachment 3 to the September 25, 1984 letter from GPC to the NRC. The difference in those two sets of estimates results from (a) a change in the expected drift rate and (b) the use of deposition pattern information from two plants rather than just one.

The salt drift deposition rates of 31 lbs/acre/year off site and 21 lb/acre/year on site were calculated based upon an expected drift rate of 0.015%, as reported in the

CP-ER at page 3.5-2, Amendment 2, November 1973. The rates of 17 lbs/acre/year on site and 15 lbs/acre/year off site were determined on the basis of a revision in the expected drift rate received from Research-Cottrell, the cooling tower manufacturer, from 0.015% to 0.008%.

The rates of 31 lbs/acre/year on site and 21 lbs/acre/year off site were derived from maximum predicted deposition rates from four other projects, Shearon Harris 1-4, Grand Gulf 1 and 2, Susquehanna 1 and 2, and Beaver Valley 1, and deposition pattern information from one project, Susquehanna 1 and 2. The revised estimates of 17 lbs/acre/year on site and 15 lbs/acre/year off site were calculated using predicted deposition rates and deposition pattern information from those same projects and from Beaver Valley 1 and 2 combined.

The change in the expected drift rate and the use of deposition pattern information from an additional plant resulted in the revision of the maximum on-site salt deposition rate from 31 lbs/acre/year to 17 lbs/acre/year and of the maximum off-site salt deposition rate from 21 lbs/acre/year to 15 lbs/acre/year. It should be noted that the estimated rates of 17 lbs/acre/year on site and 15 lbs/acre/year off-site represent the highest of a range of figures calculated by comparing Plant Vogtle to other similar plants, as described in Attachments 2 and 3 to the September 25, 1984 letter from Georgia Power to the NRC.

R-2. Are these rates based on operating plants? If so, justify why Plant Vogtle would be similar to those used for comparison.

RESPONSE: As described in Attachment 2 to the September 25, 1984 letter from Georgia Power to the NRC, drift deposition rates predicted for five similar power plants were used to estimate a range of drift rates that could be expected at Plant Vogtle. The data about these other plants used in making the estimates was drawn from the environmental reports, safety analysis reports, and NRC environmental statements for those plants. Thus, although some of these plants are now operating, the data used was based on design information. The parameters used in comparing these plants to Plant Vogtle are set out in Attachments 2 and 3 to the September 25, 1984 letter.

R-3. (a) Give a complete and detailed analysis of all information in possession of the Applicant on the effects of salt drift on vegetation.

(b) Cite all relevant studies and summarize empirical information related to this problem.

RESPONSE: Applicants will produce for inspection and copying by the Intervenors all those documents in their possession and those consulted by Bechtel Power Corp. in relation to the VEGP project that concern the effects of salt drift on vegetation. The information sought by interrogatory R-3 can be derived from those documents.

R-4. Give a complete and detailed analysis of the expected releases of chlorine from the cooling towers. Explain the chemistry of the system in relationship to these expected releases.

RESPONSE: Based upon the Intervenor's contention 12, Applicants interpret interrogatory R-4 to request information concerning the possible release of chlorine gas (Cl2) from the VEGP cooling towers. Applicants do not expect any chlorine gas to be released from the cooling towers at Plant Vogtle. This conclusion is based upon the following factors:

(1) As noted in § 3.7.1 of the CP-ER and § 3.6.1 of the OL-ER, chlorine will be injected as a gas dissolved in water at the circulating water intake structure. The distance from the circulating water intake structure to the condenser is approximately 1,200 feet and from the condenser back to the natural draft cooling towers is approximately 1,600 feet. (See Figure 1.2.2-1 in the FSAR.) These distances are for Unit 1 and the corresponding distances for Unit 2 would be greater. (See Figure 1.2.2-1 of the FSAR.) The diameter of each circulating water conduit is 12 feet. Based on a circulating water flow of 484,600 gpm (Table 3.41 in the OL-ER), for the water to flow from the point of injection to the natural draft cooling tower would take approximately 5 minutes.

(2) As noted above, the chlorine gas is dissolved in water prior to injection into the circulating water system. When chlorine gas (Cl2) is injected into water the flowing reaction occurs:

$$Cl2 + H2O = HOCl + H^{+} + Cl-$$

This reaction occurs very rapidly and has been found to be substantially complete in less than one second at temperatures of 1° C. The complete hydrolysis of the chlorine gas occurs in a few tenths of a second at 65° F. White, G.C., Handbook of Chlorination, Van Nostrand Reinhold Company, New York (1972), p. 183. It has also been demonstrated that "the hydrolysis constant is of such magnitude that no measureable concentration of Cl2 remains in solution when the pH of the chlorinated water is more then 3.0 and the total chloride concentration is less than 1,000 mg/1." Fair, Geyer and Okun, Water and Wastewater Engineering, Volume 2, Water Purification and Wastewater Treatment and Disposal, John Wiley and Sons, Inc., New York (1968), p. 31-16. The pH of the circulating water in the cooling towers at Plant Vogtle will be between 7.0 and 8.0 with chloride concentrations of 20 to 30 mg/1. (See Table 3.6-2 in the OL-ER.) While the information in Table 3.6-2 does not include chlorides that would result from the addition of chlorine to the circulating water system, even considering these additional chlorides, the chloride

concentration in the circulating water would still be much less than 1000 mg/1.

(3) Changes in temperature do not result in any appreciable change in the hydrolysis constant. White, G. C. Handbook of Chlorination, (1972), p. 183. Therefore, passage of the circulating water through the condenser following the injection of chlorine would have no appreciable effect on the hydrolysis of chlorine gas in the water.

In summary, chlorine gas would be dissolved in water prior to injection into the circulating water system at the circulating water intake structure. Complete hydrolysis of the chlorine gas should occur within a few seconds following injection. The total time for the water to travel from the point of injection to the cooling tower is approximately 5 minutes. This provides more than ample time for the chlorine gas to be hydrolyzed. No conditions exist in the circulating water system that would hinder or reverse this hydolysis. Therefore, no measurable chlorine gas would be available in the water when it reaches the cooling tower, and no measurable chlorine gas could be released from the cooling tower.

R-5. Has new information concerning corbicula been obtained since the granting of the Construction permit? If so, provide a summary of that information.

RESPONSE: At the time of the granting of the Construction Permit, studies done by Georgia Power Company on the aquatic ecology of the Savannah River did not indicate the presence of Corbicula. (See CP-ER at § 2.7.9) The U.S. Nuclear Regulatory Commission issued I&E Bulletin 81-03 on April 10, 1981 requesting information concerning the occurrence of Corbicula. Georgia Power Company responded on July 18, 1981 noting that Corbicula had been found in the Savannah River during pre-operational environmental monitoring programs conducted on May 13, 1981. See Doug Dutton's letter to J.P. O'Reilly, NRC Region II, of July 18, 1981 as clarified by D. O. Foster's letter to J.P. O'Reilly of February 4, 1982.

In response to NRC Question E291.10 (page QE291.10-1 of the OL-ER), Georgia Power Company provided comments on TVA's experience with controlling Corbicula as noted in I&E Bulletin 81-03. In response to NRC question E291.13 (page QE291.13-1 of the OL-ER), Georgia Power Company provided information concerning the occurrence of Corbicula in the U.S. and specifically the Savannah River Basin. In response to NRC question E291.15 (page QE291.15-1 of the OL-ER), Georgia Power Company provided information concerning Corbicula spawning seasons.

On May 30, 1984 the NRC staff and its consultant, Dr. Clement Counts, III, visited the VEGP site and the Savannah River Plant to discuss Corbicula. The summary

of that meeting in Melanie A. Miller's letter of October 3, 1984 was provided to the Intervenors.

R-6. Has the Applicant increased its levels of chlorine in response to the presence of corbicula? If so, to what levels? How has the environmental impact of this increase been quantified by Applicant?

RESPONSE: No, the levels (concentration of free available chlorine) have decreased since the construction permit stage. Due to the presence of Corbicula in the Savannah River, Applicants have decided to increase the duration of chlorination during Corbicula spawning season. Applicants have, however, reduced the level of free available chlorine that will be maintained in the circulating water condenser discharge from the 2.0 to 3.0 ppm stated in § 3.7 of the CP-ER to 1.0 ppm during Corbicula spawning season and to a lower level at other times.

R-7. What evidence does the Applicant have to demonstrate that its models and equations of salt and chlorine drift have been tested and found adequate and accurate for all conditions at Plant Vogtle?

RESPONSE: The methodology used by the Applicants of estimating maximum on-site and off-site salt drift deposition rates is intended to bound the actual salt deposition rates that will be experienced at Plant Vogtle. Thus, in determining the maximum on-site and off-site deposition

rates for Plant Vogtle, the Applicants determined maximum predicted deposition rates for five other similar plants and adjusted those rates to VEGP conditions. As reflected in Attachments 2 and 3 to the September 25, 1984, letter, those calculations produced a range of five numbers for the maximum on-site rate and a range of six numbers (based upon two plants and three wind directions) for the maximum off-site rate. The maximum on-site rate for Plant Vogtle of 17 lbs/acre/year estimated by the Applicants is the highest of the range of five maximum on-site rates determined by comparison to the five similar plants. The off-site rate of 15 lbs/acre/year is also the highest of the range of six numbers.

This bounding methodology was not intended to predict accurately for all conditions the salt drift that will occur at VEGP. Instead, Applicants intended to derive an estimate that, because of the conservative methodology used, would very likely exceed the maximum deposition rates that would be experienced at VEGP. Applicants believe that the methodology used achieved this goal for several reasons.

First, as described above and in Attachments 2 and 3 to the September 25, 1984, letter from Georgia Power to the NRC, the calculation technique used provided a range of deposition rates, rather than a single composite value, when transposing the results of model predictions at other

plants to VEGP. The estimated deposition rates reported by the Applicants in response to NRC Questions E451.7 and E290.8 were the maximum values in the range of predicted on-site and off-site peak salt drift deposition rates.

Second, the models for Shearon Harris 1-4 and Beaver Valley 1 used in determining the range of figures for Plant Vogtle were run during the early 1970's when modelling of salt drift deposition rates was much less sophisticated, and the rates predicted by those models when transposed to Plant Vogtle were much higher than the rates predicted by transposition of information from the more recent modelling studies used at Grand Gulf 1 and 2, Susquehanna 1 and 2, and Beaver Valley 1 and 2 combined. If only the information produced by these more recent models had been used, the estimated deposition rates for Plant Vogtle would be significantly lower.

Third, Research-Cottrell, the manufacturer of the cooling towers used at Plant Vogtle, has indicated that if it were submitting a proposal today for the same cooling towers it would guarantee a drift rate of 0.008% and the expected drift rate would be 0.002%. That expected drift rate is four times smaller than the expected drift rate used by the Applicants in estimating the maximum salt drift deposition rates for Plant Vogtle.

R-8. Has the Applicant catalogued and evaluated agricultural land use and natural ecosystems surrounding

Plant Vogtle and accounted for all possible routes of salt and chlorine contamination of these systems? If so, please provide this catalogue and evaluation for CPG/GANE's inspection.

RESPONSE: Applicants have not attempted to account for all possible routes by which salt and chlorine in the cooling tower drift could reach agricultural areas and natural ecosystems in the vicinity of Plant Vogtle. Certain sections of the CP-ER and OL-ER, however, do discuss agricultural land use and natural ecosystems surrounding Plant Vogtle. Section 2.7 of the CP-ER provides descriptions of vegetation, insects, amphibians and reptiles, birds, mammals, and aquatic flora and fauna on and around the VEGP plant site. Section 2.2.3 of the CP-ER discusses farming and dairies within a five mile radius of the VEGP plant site. Appendix B of the CP-ER provides specific data on agricultural production within five miles of the VEGP plant site.

Section 2.1.3 of the OL-ER discusses land use within a five mile radius of and agricultural activity in the vicinity of the VEGP. Section 2.2 of the OL-ER discusses the ecology of the VEGP site and adjacent surface water streams. The Applicants' responses to NRC Questions E290.1, E291.17, E291.18 and E451.7 provided copies of specific studies to the NRC relating to the ecology of the VEGP site and the adjacent streams. See pages QE290.1-1,

QE291.17-1, QE291.18-1, and QE451.7 of the OL-ER. Additional information regarding the ecology of the site and adjacent streams can be found in response to NRC Questions E290.2, E291.14, and E290.18 in the OL-ER. Adult and larval fish studies of the Savannah River were submitted to the NRC in accordance with Condition E(7) of the Construction Permit.

Georgia Power Company has also consulted with the Burke County representative of the Soil Conservation Service concerning crops in Burke County within approximately five miles of the VEGP. The following inventory of crops for 1983 was developed based on an examination of aerial photos:

soybeans	3,009 acres
corn	928 acres
peanuts	1,112 acres
wheat	661 acres
millett	25 acres
rye	403 acres
sunflowers	317 acres
TOTAL	6,455 acres

Using these photos, the closest agricultural activity, as measured from the center of the cooling towers for both units, was:

North - Savannah River Plant ("SRP") - no agricultural activity.
Northwest - Soybeans at 3.25 miles.
West - Soybeans at 3.0 miles; unknown cultivation at 2.5 miles.
Southwest - Unknown cultivation at 1.5, 2.0, and 3.0 miles; soybeans, peanuts and corn at 4.5 miles.
South - Soybeans and peanuts at 4.5 miles.

Southeast - Soybeans, peanuts and wheat at 4.0 miles.
East - SRP - no agricultural activity.
Northeast - SRP - no agricultural activity.

R-9. What are the surface and surficial aquifer transmissions from the cooling tower effluent?

RESPONSE: Applicants object to interrogatory R-9 on the following grounds:

(1) interrogatory R-9 seeks information that is not relevant to the subject matter of this proceeding and that is not reasonably calculated to lead to the discovery of admissible evidence,

(2) interrogatory R-9 requests information that is beyond the scope of those matters identified as being in controversy in this proceeding by the Board in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2-715a, and

(3) interrogatory R-9 is vague, confusing, and not susceptible to a proper response by Applicants, since Applicants do not know what the Intervenors mean by "surface and surficial aquifer transmissions."

S-1. Provide all information in possession of the Applicant on the expected effects on the environment of salt emissions.

RESPONSE: Applicants will produce those documents in their possession or under their control that fall within the category of documents described in request to produce

S-1, as well as any documents consulted by Bechtel Power Corporation in relation to salt drift effects at Plant Vogtle.

S-2. Provide all information in the Applicant's possession relating to the presence or potential presence of corbicula in the water taken from the Savannah River.

RESPONSE: Applicants will produce those documents in their possession or under their control that fall within the category of documents described in request to produce S-2.

S-3. Provide all information in possession of the Applicant on the expected effects on the environment of chlorine emissions.

RESPONSE: Based upon Intervenors' contention 12, Applicants interpret request to produce S-3 to refer to chlorine gas. Applicants will produce those documents in their possession or under their control that fall within the category of documents described in request to produce S-3.

S-4. Provide all micrometeorological data available to predict atmospheric transport of salt and chlorine from the cooling towers.

RESPONSE: Micrometeorological data is available from the meteorological tower located on the VEGP site. Section 2.3 of the FSAR describes and summarizes this data. Other information concerning this data can be found in the Applicants' response to NRC Questions E451.1 through

E451.17 in the OL-ER and Questions 451.1 through 451.20 in the FSAR.

The raw data from the meteorological tower at Plant Vogtle is stored on computer tape. Applicants will provide Intervenors with a print out or computer tape of that data provided the Intervenors agree to pay the cost, which the Applicants estimate to be $500 to $1000.

S-5. Please provide copies of all tests, test results, studies, memoranda, scientific treatises and other reports or information (whether published or not) which to Applicant's knowledge tend to support, contradict or otherwise relate to any answer to the interrogatories included above.

RESPONSE: Applicants object to request to produce S-5 on the following grounds:

(1) request to produce S-5 is overly broad, unduly burdensome, and oppressive, and producing the requested documents would necessitate an unreasonable and costly expenditure of time, effort, and research by Applicants, and

(2) Applicants cannot properly respond to request to produce S-5 because the description of the category of documents sought is too vague and is susceptible to varying interpretations.

Subject to those objections, Applicants further respond to request to produce S-5 by stating that they

will produce for inspection and copying by the Intervenors any documents referenced in their responses to interrogatories R-1 through R-9 that have not been produced in response to requests to produce S-1 through S-4.

Respectfully submitted,

James E. Joiner

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Counsel for Applicants

DATED: November 29, 1984.

November 29, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board '84 DEC -3 A10:44

In the matter of:	:	
	:	
GEORGIA POWER COMPANY, et al.	:	Docket Nos. 50-424
	:	50-425
(Vogtle Electric Generating Plant, Units 1 and 2)	:	
	:	

CERTIFICATE OF SERVICE

I hereby certify that copies of Applicants' Response to Intervenors' First Set of Interrogatories and Request for Production of Documents, dated November 29, 1984, were served upon those persons on the attached Service List by deposit in the United States mail, postage prepaid, or where indicated by an asterisk (*) by hand delivery, this 29th day of November, 1984.

James E. Joiner

James E. Joiner
Attorney for Applicants

Dated: November 29, 1984

November 29, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the matter of:	:	
	:	
GEORGIA POWER COMPANY, et al.	:	Docket Nos. 50-424
	:	50-425
(Vogtle Electric Generating Plant, Units 1 and 2)	:	

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