February 13, 1985

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 OL
	:	50-425 OL
(Vogtle Electric Generating Plant, Units 1 and 2)	:	

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

On January 9, 1984, Joint Intervenors Campaign for a Prosperous Georgia and Georgians Against Nuclear Energy served upon Applicants by mail their Third Set of Interrogatories and Requests to Produce. In its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, dated September 5, 1984, the Atomic Safety and Licensing Board (ASLB or Board) adopted a stipulation entered into by the parties that provided for two rounds of discovery. The discovery requests contained in the Intervenors' Third Set of Interrogatories and Requests to Produce comprise the Intervenors' second round of discovery requests on Contentions 7, 10.1, 10.3, 10.5, 10.7, 11, 12, and 14, and follow up on Intervenors' First Set of

Interrogatories and Requests to Produce, to which Applicants responded on November 29, 1984. Applicants provide herein their responses to those discovery requests.

Documents produced by the Applicants in response to the Intervenors' Third Set of Interrogatories and Requests to Produce, as well as documents produced in response to the Intervenors' First Set of Interrogatories and Requests to Produce, will be available at the discovery room established by the Applicants at the Vogtle Electric Generating Plant (VEGP) for inspection and copying until the date for close of discovery on contentions 7, 10.1, 10.3, 10.5, 10.7, 11, 12, and 14 established by the Board's September 5, 1984 Memorandum and Order at 47-48 and the parties' subsequent stipulation adding 30 days to the discovery period for depositions. Documents produced by the Applicants in Response to Intervenors' Second Set of Interrogatories and Requests to Produce will be available at the VEGP discovery room for inspection and copying until the close of discovery on Contention 8.

OBJECTIONS TO INSTRUCTIONS

Applicants object to the preliminary instructions contained in Intervenors' Third 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 (NRC) 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' Third Set of Interrogatories and Requests to Produce.

A-1. Please identify (by name, business, address, occupation and employer) all individuals who have knowledge or information responsive to each interrogatory and designate the interrogatory or the part thereof which that individual answered.

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

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

(2) to the extent that interrogatory A-1 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 by stating that the Applicants' responses to the Intervenors' Third Set of

Interrogatories were prepared by Applicants' attorneys based upon information received from the following persons:

Nora A. Blum - Engineering Supervisor - Environmental
Bechtel Power Corporation
12400 East Imperial Highway
Norwalk, California 90650
- Interrogatories B-8 and B-37.

Willard L. Bowers - Manager, Environmental Compliance
Alabama Power Co.
P. 0. Box 2641
Birmingham, Alabama 35291
- Interrogatories B-2, B-4, B-9(a), B-10, B-12, B-18, B-31, B-38, and B-50.

Robert W. Carlson - Engineer
Reactor Coolant System (RCS)
Components Licensing
Nuclear Technology Division (NTD)
Westinghouse Electric Corporation
P. 0. Box 355
Pittsburgh, Pennsylvania 15230
- Interrogatories B-45 through B-47.

Elaine Y. Chang - Environmental Engineer
Bechtel Power Corporation
12400 East Imperial Highway
Norwalk, California 90650
- Interrogatories B-8 and B-37.

Bill Chenault - Diesel Generator Consultant
Route 2, Box 299A
Waynesboro, Georgia 30830
- Interrogatories B-6(a) through (n).

Thomas W. Crosby - Geologist
Bechtel Civil and Minerals, Inc.
P. 0. Box 3695
San Francisco, California 94119
- Interrogatories B-3, B-5, B-11, B-13 through B-17, B-19 through B-24, B-28 through B-30, and B-32 through B-36.

Larry Eppler - Diesel Generator Engineer
Bechtel Power Corporation
12400 East Imperial Highway
Norwalk, California 90650
- Interrogatories B-6(a) through (n).

C. R. Farrell - Hydrogeologist
Bechtel Civil and Minerals, Inc.
P. O. Box 3965
San Francisco, California 94119
- Interrogatories B-3, B-5, B-11, B-13 through B-17, B-19 through B-24, B-28 through B-30, and B-32 through B-36.

Kathleen M. Fitzgerald- Environmental Engineer
Bechtel Power Corporation
12400 East Imperial Highway
Norwalk, California 90650
- Interrogatories B-8 and B-37.

Morton I. Goldman - Senior Vice President and
Technical Director
NUS Corp.
910 Clopper Road
Gaithersburg, Maryland 20878
- Interrogatories B-1, B-9(b), B-37, B-49.

V. C. Gonzales - Equipment Qualification Supervisor
Bechtel Power Corporation
12400 East Imperial Highway
Norwalk, California 90650
- Interrogatory B-7.

Carl N. Hirst - Manager
RCS Components Licensing, NTD
Westinghouse Electric Corporation
P. O. Box 355
Pittsburgh, Pennsylvania 15230
- Interrogatories B-45 through B-47.

Joe L. Leamon - Project Quality Assurance Engineer
Southern Company Services
P. O. Box 2625
Birmingham, Alabama 35202
- Interrogatories B-6(o) and (q).

David D. Malinowski - Manager
Steam Generator Field Data Analysis
Steam Generator Technology Division
Westinghouse Electric Corporation
P. O. Box 355
Pittsburgh, Pennsylvania 15230
- Interrogatories B-45 through B-47.

Roger Moore - Contracts and Support Manager
Georgia Power Company
P. O. Box 282
Waynesboro, Georgia 30830
- Interrogatory B-6(r).

Steve Phillips - Maintenance Supervisor
Georgia Power Company
Route 2, Box 299A
Waynesboro, Georgia 30830
- Interrogatories B-6(a) through (n), (v), (w), (z).

Joseph R. Schulties - Lead Engineer for Steam Generator Evaluation
RCS Components Licensing, NTD
Westinghouse Electric Corporation
P. O. Box 355
Pittsburgh, Pennsylvania 15230
- Interrogatories B-45 through B-47.

Bahu Shete - Diesel Generator Engineer
Bechtel Power Corporation
12400 East Imperial Highway
Norwalk, California 90650
- Interrogatories B-6(a) through (n).

Daniel H. Warren - Environmental Licensing Engineer
Southern Company Services, Inc.
P. O. Box 2625
Birmingham, Alabama 35202
- Interrogatories B-2, B-4, B-9(a), B-10, B-12, B-18, B-31, B-38, and B-50.

L. R. West - Hydrogeologist
Bechtel Civil and Minerals, Inc.
P. O. Box 3965
San Francisco, California 94119
- Interrogatories B-3, B-5, B-11, B-13 through B-17, B-19 through B-24, B-28 through B-30, and B-32 through B-36.

John Wheless - Nuclear Projects Engineer
Southern Company Services
P. O. Box 2625
Birmingham, Alabama 35202
- Interrogatories B-6(a) through (n) and (u).

Gary W. Whiteman - RCS Components Licensing, NTD
Westinghouse Electric Corporation
P. O. Box 355
Pittsburgh, Pennsylvania 15230
- Interrogatories B-45 through B-47.

Ping Wong - Mechanical Engineer
Bechtel Power Corporation
12400 East Imperial Highway
Norwalk, California 90650
- Interrogatories B-6(t) and (y).

A-2. Please identify any Open Items and identify (by name, business address, occupation and employer) all individuals working on the resolution of the Open Items and designate the Item or the portion thereof the individual is working on. Please also provide any documents related to the Open Items.

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

(1) interrogatory A-2 is vague, confusing, and not susceptible to a proper response by Applicants since Intervenors do not identify what they are referring to by their use of the term "Open Items";

(2) interrogatory A-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;

(3) interrogatory A-2 requests information outside the scope of those matters identified as being in controversy in this proceeding by the ASLB in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2-715a; and

(4) interrogatory A-2 is overly broad, unduly burdensome, and oppressive.

A-3. VEGP Response to IQA-1 identified almost seven pages of names, addresses, and organizations of individuals providing technical information to VEGP and their responses to Intervenor questions, but the VEGP responses did not include the financial relationship among themselves, the organizations they represent and VEGP. Nor did the VEGP response to question A-1 identify the specific renumeration between VEGP and these individuals. The Rosenthal experimenter expectancy effect is a well documented research bias displayed unwittingly by an experimenter that can skew or lead technical statements to predictable conclusions. As F. W. Bessel, a German astronomer, first proved in 1815, individual differences even among most experienced astronomers can lead to observational differences. Rosenthal experimenter expectancy effect builds on top of individual differences by skewing an experiment along lines of bias or prejudgment. The VEGP technical consultants should assist in measuring the

pronouncement of this effect on VEGP technical responses. Please provide an estimate of this effect.

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

(1) interrogatory A-3 is vague, confusing, and not susceptible to a proper response by Applicants;

(2) interrogatory A-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

(3) interrogatory A-3 requests information beyond the scope of those matters identified as being in controversy in this proceeding by the ASLB 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 A-3 that neither they nor the contractors who provided information used by Applicants in responding to Intervenors' First Set of Interrogatories and Requests to Produce have estimated or measured the "pronouncement" of the "Rosenthal experimenter expectancy effect" on those prior responses.

A-4. How much independent data gathering has the NRC staff done on VEGP? Has an independent assessment of the NRC staff's analyses of VEGP been completed? Please detail all technical differences between the VEGP and the NRC.

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

(1) interrogatory A-4 is vague, confusing, and not susceptible to a proper response by Applicants. Applicants do not have information about the extent to which the NRC staff has engaged in "independent data gathering" concerning Plant Vogtle except as such information is reflected in publicly available documents such as the Draft Environmental Statement (Draft ES) or the Draft Safety Evaluation Report (Draft SER) for Plant Vogtle. Also, Applicants do not know what Intervenors mean by an "independent assessment" of the NRC staff's analyses of Plant Vogtle.

(2) Interrogatory A-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,

(3) interrogatory A-4 asks for information outside the scope of those matters identified as being in controversy in this proceeding by the ASLB in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2-715a, and

(4) interrogatory A-4 is overly broad, unduly burdensome, and oppressive.

B-1. When will Morton Goldman have "compiled the facts [and] formulated the opinions to which he will

testify," as stated in "Applicants' Response to Intervenors' First Set of Interrogatories and Request for Production of Documents" (hereinafter "Applicants' First Response"), page 9?

RESPONSE: Applicants expect Dr. Goldman to testify concerning the salt and chlorine that will be emitted in the drift from the natural draft cooling towers at Plant Vogtle. The substance of the facts and opinions to which Dr. Goldman is expected to testify concerning salt drift from the VEGP cooling towers and a summary of the grounds for those opinions are set out in a report prepared by Dr. Goldman and NUS Corporation entitled "An Evaluation of Cooling Tower Drift Deposition at the Vogtle Electric Generating Plant" and dated January 29, 1985. A copy of that report will be provided to Intervenors with these discovery responses.

With respect to chlorine emitted from the VEGP natural draft cooling towers, the substance of the facts and opinions to which Dr. Goldman is expected to testify and a summary of the grounds for those opinions are set out in the Applicants' response to interrogatory B-49 of the Intervenors' Third Set of Interrogatories.

B-2. Do the Applicants have no intention of designing post-operational radiological monitoring programs prior to operation of the plant, as implied in "Applicants' First Response" p. 20?

RESPONSE: Monitoring programs for Plant Vogtle will be divided into three distinct phases, pre-operational monitoring, operational monitoring, and post-operational monitoring. Pre-operational monitoring occurs before the plant becomes operational and includes the gathering of background data on various environmental parameters against which operational monitoring data can be compared to assess the impacts of operation. Operational monitoring occurs during the period of operation of the plant. Post-operational monitoring, if required, would be instituted after the plant has been retired or decommissioned. The Applicants will not draft a post-operational monitoring program for VEGP prior to the plant beginning operation.

B-3. In "Applicants' First Response" p. 26, Applicants state, "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. . ." Please describe the levels of the ground-water during construction from which it has "recovered."

RESPONSE: Construction dewatering at VEGP is discussed in Section 2.4.12.1.3.3 of the Final Safety Evaluation Report (FSAR). The effect of the construction dewatering system upon the water table aquifer can be seen in the cone of

depression in the March 1980 water levels surrounding the construction excavation, which are shown on Figure 2.4.12-7 of the FSAR (dated August 1984).

B-4. What provisions have Applicants made for availability of "temporary tanks or containers," including assurances that such containers will provide safe storage for radioactively contaminated water and that they would be available in a timely fashion, as stated in "Applicants' First Response" p. 30?

RESPONSE: Any temporary tanks or containers utilized at Plant Vogtle for the storage of radioactively contaminated water would be required to meet the limiting conditions of operation that will be specified in the plant's radiological effluent technical specifications to assure that they will provide safe storage. The Applicants are not required to and have made no arrangements to assure the availability of such temporary tanks or containers.

B-5. How would radioactive contamination of the Mathes Pond "be intercepted" ("Applicants' First Response" p. 40)?

RESPONSE: Mathes Pond would itself intercept any contaminants spilled at the plant that reached the water table aquifer. Mathes Pond is at the head of one of the stream channels that bound the plant site and act as interceptor drains for the water table aquifer in the sediments

overlying the marl, as described in Applicants' response to interrogatory B-27 of the Intervenors' First Set of Interrogatories. The contours of the water table aquifer, which are shown on Figure 2.4.12-7 of the FSAR, demonstrate that directly underneath the power block the water table aquifer flows to the northwest in the direction of Mathes Pond. As reflected in Figure 2.5.1-15 of the FSAR, the bottom of Mathes Pond is on the effectively impermeable Blue Bluff marl that underlies the plant site. Thus, any spillage at the plant that reached the water table aquifer would move laterally toward and eventually drain into Mathes Pond.

B-6. In "Applicants' First Response" the Applicants made available certain documents and numbered the pages therein. The following questions concerning TDI generators relate to these documents.

(a) Page 140010, Applicants state "cause of bearing wear has not been determined." Has the cause been determined since that time? Please provide the basis for the response.

RESPONSE: Document number 140010 is a component revalidation checklist that is part of the twelve volume report prepared by the Applicants as part of their TDI Emergency Diesel Generator Resolution Program and submitted to the TDI Diesel Generator Owners Group (TDI Owners Group).

That document states that the right bank turbocharger's thrust journal bearing was replaced because of bearing wear. The Applicants believe that the wear was caused by lack of lubrication during testing prior to shipment.

As indicated in the document number 140010, the worn bearing was replaced. To prevent excessive wear of the thrust journal bearings in the future, the Applicants will add a pre-lube system. Furthermore, the maintenance and surveillance program that the Applicants will implement for the TDI diesel generators will include monitoring bearings for degradation.

(b) Page 140028, the cause is "unknown at this time." Has the cause since been determined? Provide the basis for the response.

RESPONSE: Document number 140028 is the first page of a non-conformance report that is also part of the Applicants' report to the TDI Owners Group. The worn thrust journal bearing that is the subject of this non-conformance report is the same bearing discussed in Applicants' response to interrogatory B-6(a) above, and the Applicants refer Intervenors to and incorporate herein that response.

(c) Page 140323, the cause is "suspected." Has the cause since been confirmed? Provide the basis for the response.

RESPONSE: Document number 140323 is the first page of a non-conformance report that is part of the Applicants' report to the TDI Owners Group. That non-conformance report concerns "cracks in the face of cylinder head stud lock washers, head 6 L position 6 and head 6 R positions 3 [and] 6." The Applicants believe that the cracks in the lock washers were caused by too much torque being applied during their installation.

The cracked lock washers were replaced with new lock washers. The TDI Owners Group has recommended that the torque values for the cylinder head studs be revised, and the Applicants have accepted that recommendation.

(d) Page 140385, the cause is 'suspected." Has the cause been confirmed? Please provide the basis for the response.

RESPONSE: Document number 140385 is the first page of a non-conformance report that is part of the Applicants' report to the TDI Owners Group. That non-conformance report relates to "galling noted on rod bearing bolts, washers, and nuts." The Applicants believe the cause of that galling on the connecting rod bearing bolts, washers, and nuts to be dry installation without lubrication by TDI.

The damage to the bolts and nuts was corrected by machining, and the washers were replaced. The bolts, nuts, and washers were lubricated prior to reassembly to minimize further galling.

(e) Page 140488, the cause is "suspected." Has the cause since been confirmed? Please provide the bases for the response.

RESPONSE: Document number 140488 is the first page of a non-conformance report contained in the Applicants' report to the TDI Owners Group. That non-conformance report addresses "thread damage on piston crown to skirt stud." The Applicants believe that the damage occurred during disassembly or reassembly as the result of an object hitting the stud causing damage to the threads. The damaged stud was replaced.

(f) Page 140626, the cause is "unknown." Has the cause since been ascertained? Please provide details, including the bases for the response.

RESPONSE: Document number 140626 is part of a non-conformance report contained in Applicants' report to the TDI Owners Group. That non-conformance report concerns unacceptable readings on gearsets 2-5 and gearsets 4-5. The Applicants believe that the back-lash gear measurements were inaccurate because the bearing caps were not installed.

The measurements will be taken again before pre-operational testing. Moreover, the maintenance and surveillance program that the Applicants will implement for the TDI diesel generators will include periodically inspecting the gearsets and taking measurements.

(g) Page 140684, the cause is "suspected." Has the cause since been confirmed? Please provide the bases for the response.

RESPONSE: Document number 140684 is a non-conformance report that is part of the Applicants' report to the TDI Owners Group. That non-conformance report relates to unacceptable indications found on valve seat "U" on cylinder head 2 R and valve seat "Z" on cylinder head 6 L. The Applicants believe that the indications resulted from cracks in welded areas that occurred during the manufacture of the cylinder heads.

The two cylinder heads were returned to TDI for repair. On each cylinder head the weld was removed, and the area was rewelded, machined, and dye penetrant tested. In the future, the cylinder heads will be periodically inspected visually under the maintenance and surveillance program that the Applicants will implement for the emergency diesel generators.

(h) Page 140723, the cause is "unknown." Has the cause since been determined? Please provide details, including the bases for the response.

RESPONSE: Document number 140723 is a non-conformance report that is part of the Applicants' report to the TDI Owners Group. That non-conformance report concerns a linear indication found on the firing deck of cylinder

head 6 R. The Applicants believe that the indication resulted from a casting defect that occurred during the manufacture of the cylinder head.

The Applicants shipped the cylinder head back to TDI, which removed the indication by machining and hydrotested the repaired cylinder head. Once the cylinder head was returned to VEGP, it was again tested. The cylinder head will be inspected periodically as part of the maintenance and surveillance program.

(i) Page 140749, the cause is "suspected." Has the cause since been confirmed? Please provide the bases for the response.

RESPONSE: Document number 140749 is a non-conformance report taken from the Applicants' report to the TDI Owners Group. That non-conformance report addresses the thickness of the firing deck on cylinder head 1 R. Applicants believe that the cause of the thin section in the cylinder head firing deck was a casting defect.

The cylinder head was replaced by another cylinder head that met the TDI Owners Group acceptance criteria. The maintenance and surveillance program for the diesel generators will include periodic visual inspection of the cylinder heads.

(j) Page 140936, the cause is "suspected." Has the cause since been confirmed? Please provide the bases for the response.

RESPONSE: Document number 140936 is a non-conformance report contained in Applicants' report to the TDI Owners Group. That non-conformance report concerns a linear indication on the subcover of cylinder head 6 L. The Applicants believe the cause of the indication to be a casting defect that occurred during the manufacturing process.

The damaged subcover was replaced with a subcover that passed the TDI Owner's Group acceptance criteria. The maintenance and surveillance program for the VEGP diesel generators will include periodic tests of the subcover assemblies.

(k) Page 141223, the cause is "suspected." Has the cause since been confirmed? Please provide the bases for the response.

RESPONSE: Document number 141223 is the first page of a non-conformance report contained in the Applicants' report to the TDI Owners Group. That non-conformance report concerns grooving in a back plate wear ring of the jacket water pump. The Applicants believe that the damage occurred to the back plate wear ring during its installation by TDI. The wear ring was replaced with a ring that passed the TDI Owners Group acceptance criteria.

(l) Page 141256, the cause is "unknown." Has the cause since been ascertained? Please provide details, including the bases for the response.

RESPONSE: Document number 141256 is part of a non-conformance report included in the Applicants' report to the TDI Owners Group. That non-conformance report addresses damage to the threads on a base bolt for the right bank turbocharger. The Applicants believe that the bolt threads were damaged during disassembly of the turbocharger for inspection. The bolt was replaced with a satisfactory bolt.

(m) Page 141401, on 8-8-84, the results were marked "sat[isfactory]" and on 8-10-84, were changed to "Unsat[isfactory]." Why were the results changed? Why was it initially marked satisfactory? Provide details, including the bases for the response.

RESPONSE: Document number 141401 is part of a quality control inspection plan included in the Applicants' report to the TDI Owners Group. That document concerns verification of the torquing of the intake elbow cap screws on one of the diesel generators. The results of the torque measurements taken on the intake elbow cap screws were originally marked satisfactory based upon an examination of the screws that had been installed. Four of the elbows, however, can not be installed until after installation of the diesel generator in its permanent location. Therefore, the results reported on document 141401 were changed to unsatisfactory until the cap screws for those four elbows

are installed and torque measurements can be taken on the screws for those elbows. Once the last four elbows have been installed, those torque measurements will be made.

(n) Page 141826, the cause is described as "apparently. . ." Has the cause since been confirmed? Provide details, including the bases for the response.

RESPONSE: Document number 141826 is a blank divider page contained in the Applicants' report to the TDI Owners Group. The Applicants assume that the Intervenors meant to refer to document number 141827, which is a component revalidation checklist contained in that same report. That document concerns inspection of the turbocharger for one of the diesel generators and indicates that "on the right turbocharger several blades were bent on both the turbine wheel and the nozzle ring." The Applicants believe that the turbocharger blades were bent during testing of the diesel generator by TDI. The damaged rotor assembly was replaced with a satisfactory assembly.

(o) Page 144505, the Applicants state, "A review has also been made of the quality assurance program at TDI and it has been concluded that there has not been a significant breakdown in the quality program at TDI." In view of the extraordinarily poor record at TDI, what would be a significant breakdown in the quality program at TDI? Please be specific and provide the bases for the response.

RESPONSE: Document number 144505 is the second page of a document entitled "Evaluation for a Substantial Safety Hazard, Evaluation for a Significant Deficiency" that is part of the Applicants' report to the TDI Owners Group. That document addresses a potential problem with the diesel generator drive couplings. TDI had discovered on a non-nuclear commercial engine installation that the flexible coupling drive hubs were loose on the shafts in the overspeed governor fuel transfer pump drive. The hubs were manufactured by a subvender and installed by TDI.

The Evaluation concludes that this condition was reportable under the requirements of 10 C.F.R. Part 21 and 10 C.F.R. § 50.55(e). As noted by the Intervenors, the Evaluation also states that a review had been made of the quality assurance program at TDI with respect to this condition resulting in the conclusion that a significant breakdown had not occurred in the quality program at TDI.

This conclusion concerning the quality program at TDI was based upon information received from TDI advising the Applicants that the couplings that "worked loose" did so because the alignment tolerances specified by the coupling manufacturer proved to be excessive after extended periods of continuous engine operation. Utilizing the manufacturer's recommendation regarding use of his product is normal practice. TDI's procedures for installation and

inspection of these couplings reflected the manufacturer's recommendation and were properly implemented. TDI advised the Applicants concerning the recommended corrective action and revised its shop installation and inspection procedures to restrict further alignment tolerances based upon this operating experience.

In reviewing TDI's quality assurance program with regard to the condition discussed in the Evaluation, and in implementing and complying with 10 C.F.R. 50.55(e) and 10 C.F.R. 50, Appendix B, Criterion VII regulations generally, the Applicants follow the guidance issued by the NRC on April 1, 1980. That guidance states in part:

> d. Significant Breakdown in Quality Assurance
>
> A breakdown in the QA program related to any criteria in 10 CFR 50, Appendix B, may be a reportable deficiency depending upon its significance. This applies to those design and construction activities affecting the safety of plant operations, including activities such as design verification, inspection, and auditing. For example, QA program breakdown may result from an improper identification system for safety related materials. More specifically, the implementing procedures may be incomplete or otherwise inadequate, or the execution of adequate procedures may be incomplete, improper or completely ignored. In the latter case, not following established procedures to assure that specified quality related requirements are met, for example, may constitute a breakdown in the QA program that is reportable.
>
> Similarly, an inadequate record keeping system that makes it impossible on a broad scale to determine whether quality requirements have been met, is another example. In

such a case extensive evaluation and testing may be required to establish that applicable requirements have been met.

Conversely, occasional, incomplete or otherwise inadequate records that do not indicate a significant breakdown in the QA program nor an unsafe condition are not considered reportable. For example, if during site construction, delivery times (from mixing to placing) of a few of many truckloads of concrete are not recorded as required, and it can be shown by other records that requirements important to safety have been met, the matter would not be reportable. These other records may be related concrete truck trip tickets, batch plant records or acceptable test results of concrete samples representing concrete from these trucks. The lack of complete records in this example would not lead to unsafe plant operation, nor would it constitute a significant breakdown in the QA Program.

(p) Page 1414811, Applicants state, "Suppliers were evaluated prior to award to assure that their quality assurance program and facilities complied with the procurement document requirements. . .based on surveys, past performances, audits, and the review and approval of the suppliers' documented quality programs." Would the Applicants again choose TDI if ordering new emergency diesel generator for a new nuclear power plant today? If not, why not? If so, why? Provide the bases for the response.

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

(1) interrogatory B-6(p) asks a hypothetical question to which Applicants could respond only through abstract speculation, and

(2) interrogatory B-6(p) 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.

(q) Page 1414812, Applicants state, "Surveillance inspections were performed at the supplier's facility. . ." Was the supplier notified in advance of these inspections? Describe the inspection process in detail.

RESPONSE: While vendors, in this case TDI, are aware in advance of inspections that are to be performed at predetermined witness points and hold points, the vendor surveillance inspection process also includes other random unannounced inspections. The surveillance inspection process for the TDI diesel generators is described in the following documents:

(1) "A-1 Quality Surveillance Plan for Unfired Pressure Vessels for Plant Vogtle--Units 1 and 2," revision 2, dated March 5, 1981;

(2) "A-2 Quality Surveillance Plan for Tubular Heat Exchangers Vogtle Nuclear Plant--Units 1 and 2," revision 2, dated March 9, 1981;

(3) "B-6 Inspection Plan for Mechanical Equipment Diesel Engine for Plant Vogtle--Units 1 and 2," revision 2, dated November 13, 1980;

(4) "E-2 Inspection Plan for Electrical Aux. Boards for Plant Vogtle--Units 1 and 2," revision 1, dated February 2, 1981; and

(5) "B-2 Quality Surveillance Plan for Reciprocating Compressors for Plant Vogtle Units 1 and 2," revision O, dated April 14, 1981;

(6) "B-7 Inspection Plan for Mechanical Equipment - Motor Generator Sets for Plant Vogtle Units 1 and 2," revision 2, dated Nov. 14, 1980;

(7) "D-5 Inspection Plan for Motor Control Centers for Plant Vogtle Units 1 and 2," revision 5, dated Jan. 9, 1981; and

(8) Section 3.2 of the Procurement Supplier Quality Manual.

These documents will be produced for inspection and copying by the Intervenors.

(r) Page 149258, TDI states, "Georgia Power Company extension of cooperation to Transamerica Delaval, Inc. over the last three months has been one of hardship. . ." What is the Applicants' response to this accusation? Have relationships between TDI and the Applicants improved since that time?

RESPONSE: Document number 149258 is the second page of a three page letter from Mr. Richard Cooke of TDI to Mr. B. E. Wilson of Georgia Power Company dated April 4, 1984. Georgia Power Company responded to that letter by

letter dated April 9, 1984 from Mr. B. E. Wilson to Mr. Cooke, which document has been produced as document number 1411245. At all times during its relationship with TDI, Georgia Power Company has sought to foster a mutual cooperative effort to insure that the diesel generators supplied by TDI to VEGP are adequate to perform their intended function.

(s) Page 1410976, the Applicants state, "Should we not hear from Transamerica by this date, we will assume that there exist in your organization a lack of dedication to ensure a quality product per the specification and the contract." Do the Applicants believe that TDI is dedicated to ensuring a quality product per the specifications, contracts and regulatory requirements? Provide the bases for the response.

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

(1) interrogatory B-6(s) asks the Applicants to speculate concerning the subjective intent of TDI, and

(2) interrogatory B-6(s) 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.

(t) Page 1411006, the Applicants' contractor (Bechtel) states, "Compliance with Appendices EA Revision 2 and QG Revision O for qualification of the

equipment will not be required. Appendices EA and OG will not be incorporated as part of the contract." What are the bases for this decision?

RESPONSE: The Applicants did not require TDI to comply with Appendices EA Revision 2 and QG Revision 0 for qualification of equipment because the diesel generators were environmentally and seismically qualified under a generic qualification program rather than the VEGP specific program set out in those appendices. The generic qualification program utilized by TDI enveloped the VEGP requirements with adequate margin. Vogtle specific seismic testing was, however, conducted on certain Vogtle specific panels in accordance with Appendix QG § 2.0.

(u) Page 149327, TDI states, ". . .not all requests made in your June 19, 1984 letter can be fulfilled by TDI at this time. . .TDI has not accepted the Owners' Group X-ray criteria for rod bearings and therefore declines your request to X-ray the shells prior to delivery." Has TDI maintained this position? Has the Owners' Group maintained its position? Has this controversy been resolved? Provide details, including the bases for the response.

RESPONSE: By letter dated November 2, 1984 from C. S. Matthews of TDI to Mr. C. L. Ray, Jr., the Technical Program Director for the TDI Owners Group, TDI indicated that it would accept the Owners Group's proposed

radiography procedure for R4 engine connecting rod bearings.

(v) Page 149327, TDI says it "sees no reason to issue purchase orders and invoice after fact. The possibility of muddled documentation and responsibility exists in trying to rectify this kind of situation." Have the Applicants requested that TDI issue purchase orders and invoice after the fact? Provide the justification and bases for the response.

RESPONSE: The Applicants did on one occasion request TDI to issue purchase order invoices after the shipment of certain turbocharger parts. The parts had been shipped to the Applicants by a subvendor of TDI to whom a purchase order had been released directly. Because the purchase order had been sent to the subvendor, TDI would not provide a certificate of compliance for the parts. The Applicants did, however, obtain a certificate of compliance from the subvendor. Subsequently, the Applicants reissued a purchase order to TDI for the turbocharger parts, which parts it will substitute for the parts received from subvendor when received.

(w) Page 149327, TDI asks the Applicants to "inform TDI if GPC wishes to wave source inspection on any parts ordered. . ." Did the Applicants waive such inspection in this or any other instances? Provide details, including dates, parts, justification and the bases for the response.

RESPONSE: The Applicants have on different occasions authorized TDI to ship parts without source inspection to expedite delivery of those parts. Those parts for which source inspection was waived were subjected to more comprehensive testing after their receipt at VEGP to verify their quality. The information requested by interrogatory B-6(w) concerning the particular parts for which source inspection was waived and the dates on which those parts were shipped can be derived from the documents previously produced by the Applicants in response to request to produce E-2.

(x) Page 149472, TDI says its improvements "added over 13-1/2 percent to the cost of the engines." What is the cost of the engines?

RESPONSE: Applicants object to interrogatory B-6(x) on the ground that it 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.

(y) Page 1433156 states that certain equipment "is not available pre-qualified 1E. Westinghouse says they have no intention of qualifying it." How was the problem described if this letter resolved? Provide details.

RESPONSE: The synchronizing equipment in the diesel generator control circuitry referred to in document number 1433156 was electrically and physically isolated from class 1E circuitry.

(z) Have the Applicants considered replacing the TDI generators with another Company's product? If so, provide details as to the reason(s) this has not been done. If not, why not? Provide details, including the bases for the response.

RESPONSE: The Applicants have considered replacing the TDI diesel generators with generators from another vendor. Contract specifications were sent to various vendors with requests for quotes during the first quarter of 1984. Proposals were received from Hitachi, Mitsubishi, Hawker Siddeley, Morrison-Knudsen, and Colt Industries. After evaluation of these proposals, the Applicants decided against purchasing additional diesel generators. The Applicants have concluded that the TDI Emergency Diesel Generator Resolution Program at VEGP and the Owner's Group Design Review/Quality Revalidation Program will insure that the TDI diesel generators at VEGP are adequate to perform their intended function.

B-7. When will Applicants complete the list of polymer materials contained in the safety related equipment at Plant Vogtle as stated in "Applicants First Response" p. 51 and again on p. 55?

RESPONSE: The Applicants expect that list to be completed by March 1, 1985.

B-8. Applicants state that "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. . . . Thus, although some of these plants are now operating, the data used was based on design information." ("Applicants' First Response" p. 93). Please provide empirical data comparing the actual deposition rates during operations for those plants that are in operation and on whose predictions the Applicants relied in calculating deposition rates for Plant Vogtle. Provide the bases for the response.

RESPONSE: When the comparative analysis was performed, Beaver Valley Unit 1 had been operating since December 1976 and Susquehanna Unit 1 since June 1983. Susquehanna Unit 2 began commercial operation in November 1984. Neither of these plants has performed any monitoring of salt drift deposition rates, either by taking source term measurements or by taking field deposition measurements. Grand Gulf Unit 1 started commercial operation in January 1985 and is monitoring salt drift deposition, but the sampling results are not available.

B-9. (a) In "Applicants' First Response" p. 98, Applicants state that they "have decided to increase the duration of chlorination during corbicula spawning season." Please provide details--the duration planned at the Construction Permitting stage and the duration now planned. Provide the bases for the response.

RESPONSE: Section 3.7 of the VEGP construction permit stage Environmental Report (CP-ER) describes the chlorination schedule planned by the Applicants at the construction permit stage. The current planned chlorination schedule is set out in Section 3.6.1 of the VEGP operating license stage Environmental Report (OL-ER).

During Corbicula spawning season, chlorination of the circulating water system will be continuous at a level sufficient to provide 1 mg/liter free available chlorine at the condenser discharge. In addition, chlorine will be injected continuously during Corbicula spawning season at the river makeup water pumps as necessary to provide a level of 1 mg/liter free available chlorine at the discharge of the river makeup water pumps. The Applicants anticipate that continuous chlorination for five consecutive days per month will be necessary during Corbicula spawning season.

(b) What will be the environmental impacts of this increased duration for chlorine injection?

RESPONSE: The Applicants refer the Intervenors to and incorporate herein their response to interrogatory B-49 of the Intervenors' Third Set of Interrogatories.

B-10. Why does Research-Cottrell state that the expected drift rate is four times smaller than the expected drift rate used by the Applicants ("Applicants' First Response" p. 100)? Provide the bases for the response.

RESPONSE: In preparing the estimated salt drift deposition rate presented in Amendment 1 to the OL-ER, the Applicants used the expected drift rate of 0.015% established by the contract between the Georgia Power Company and Research-Cottrell, the supplier of the natural draft cooling towers used at VEGP. In response to NRC Question E290.8 in Amendment 3 of the OL-ER, dated May 1984, the Applicants utilized an expected drift rate of 0.008% based upon communications with Research-Cottrell. More recently Research-Cottrell has advised the Applicants that if it were to submit a bid today to supply natural draft cooling towers of the same design as the Vogtle cooling towers, the expected drift rate would be 0.004% to 0.002%. In estimating salt deposition rates for VEGP, however, the Applicants have continued to use the more conservative expected drift rate of 0.008%.

B-11. Update the number of wells on the VEGP facility. Include historical data. Differentiate between groundwater and confined aquifer wells. Include closed wells. (The FSAR lists nine wells in the confined aquifer, 16 in the unconfined aquifer, 11 initially in backfill; other information suggests 2-3 makeup water wells, 1 test well, 1 400 gpm well and one 100 gpm well; the VEGP Response to Intervenor Question (hereinafter IQ) B4 stated there were 8 confined aquifer production wells.) Precisely locate all open, active, inactive, and abandoned

wells on a clear surface map of VEGP. Use applicable well numbers. Explain the rationale on why each well site drilled or abandoned by VEGP was chosen by VEGP, especially why each well in the observation network was chosen (see Item 13 below). Discuss uncertainties in the VEGP observation network.

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

(1) interrogatory B-11 is overly broad, unduly burdensome, and oppressive;

(2) interrogatory B-11 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

(3) interrogatory B-11 is vague, confusing, and not susceptible to a proper response by Applicants, since Applicants do not know what the Intervenors mean by the phrase "uncertainties in the VEGP observation network."

Subject to these objections, Applicants further respond to interrogatory B-11 by stating that they interpret the term "groundwater" as used by the Intervenors in this interrogatory to mean the water table or "unconfined" aquifer. The documents produced by the Applicants in response to request to produce C-1 of the Intervenors' First Set of Interrogatories and Requests to Produce contain the information requested by interrogatory B-11

concerning wells drilled at Plant Vogtle, including coordinates, depths, screen intervals, and location. Also, the Applicants are having prepared certain information concerning wells to be submitted to the NRC staff, and that information will be provided to the Intervenors when available.

During the initial site exploration, certain exploratory holes were selected for completion as observation wells to obtain data on the occurrence of groundwater beneath the VEGP site. The observation wells were located throughout the site to cover a wide surface area and a wide range of depths. Using those wells, the Applicants monitored the aquifers beneath the site. After the plant was designed and construction began, observation wells that had been located in areas where they impaired construction activities were abandoned. These wells were sealed with grout. In order to maintain groundwater monitoring, new observation wells were installed outside construction areas to replace those observation wells that were abandoned. Construction activities may in the future necessitate abandonment and replacement of one or more of the current observation wells.

B-12. The FSAR (Table 2.4.12-3) lists 18 wells and water quality analyses for those 18 wells. The analyses were done in 1971. Table 4.5 of the Vogtle DES lists the known characteristics of the VEGP water, low volume waste

and combined effluent systems. In the FSAR data base does not have all of these same characteristics listed and may not therefore establish the pre-migration level of certain nuclides (e.g., PSS, mercury, zinc, etc.; cf., VEGP Response to IQ B-18, p. 32). Neither DES Table 4.5 nor the FSAR tables establish a radionuclide datum.

Update the water quality for all wells for all characteristics listed in DES Tables 4.2 and 4.5. Establish a quarterly datum in all wells for liquid waste radioactive and hazardous nuclides treated, stored, or released as an airborn or liquid effluent from VEGP. Duplicate for springs and surface water data in the FSAR (Tables 2.4.12-5, 6). Precisely locate each spring and surface water sampling point on a clear surface map of VEGP denoting all boundaries. Explain all monitoring techniques.

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

(1) interrogatory B-12 is overly broad, unduly burdensome, and oppressive;

(2) interrogatory B-12 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

(3) interrogatory B-12 requests information outside the scope of those matters identified as being in controversy in this proceeding by the ASLB in its Memorandum and

Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2-715a.

Subject to these objections, the Applicants state in further response to interrogatory B-12 that they have produced for inspection and copying by the Intervenors analyses of well water conducted since 1971. These analyses include the following parameters: ph, alkalinity, hardness, turbidity, sodium, potassium, calcium, magnesium, iron, copper, zinc, manganese, chromium, silver, cadmium, mercury, dissolved solids, chloride, and nitrate.

Table 4.5 of the Vogtle DES pertains to the VEGP non-radioactive effluents. Monitoring for these effluents is specified by the NPDES permit issued by the State of Georgia. In addition, any non-radioactive "groundwater" monitoring requirements are the responsibility of the Georgia Environmental Protection Division.

Tables 5.8 and 5.9 of the DES contain descriptions of the Applicant's pre-operational radiological environmental monitoring program. The results of this program are summarized in Tables 6.4-1 through 6.4-10 of the OL-ER. This pre-operational monitoring program will establish a "radionuclide datum." Radioactive groundwater monitoring requirements during operation of the VEGP will be established in the radiological effluent technical specifications.

Figures 2.5.1-12 and 2.5.1-13 of the FSAR show surface stream locations in relation to the VEGP site. Section 6.1 of the OL-ER contains figures showing sampling points.

B-13. There are 34 observation wells listed in Table 2.4.12-7, FSAR, vs. the 36 noted in the FSAR text (p. 2.4.12-9). Table 2.4.12-7 lists two sets of data for well water levels through 1974 and then for 1979. Only 14 of 34 wells are to be found in both sets of data. Explain. List all wells in Item 11 above from these data sheets and any other wells not included, whether the wells are operational or have been closed or abandoned. Include data for well 42E (cf. Items 33, 34, 35 below).

RESPONSE: The total number of observation wells constructed on the VEGP site during the period 1971 to the present is greater than the number existing at any one time due to the need to abandon and replace wells in the way of construction activity. The Applicants are having prepared certain information concerning wells to be submitted to the NRC staff and will provide that information to the Intervenors when available. The Applicants object to the latter part of interrogatory B-13, beginning with "List all wells," on the ground that it is vague, confusing, and not susceptible to a proper response.

B-14. Aquiclude wells 42B/C data (Table 2.4.12-7, sheet 1/3) showed varying water heights. If these wells

were in marl, supposedly an "impermeable" marl, what was the source of the water? Explain the varying water heights. Were these wells pumped? If pumped, provide the pumping data. Provide water flow rates for wells 42B/C.

RESPONSE: Water levels in observation wells open to the marl reflect fluctuations in hydrostatic pore pressure within the marl. The fluctuations are not a measure of groundwater flow. The observation wells were not pumped. The Applicants' response to interrogatory B-25 of the Intervenors' First Set of Interrogatories provides an extensive discussion of the observation wells open to the marl.

B-15. Table 2.4.12/7, FSAR, lists at least three confined aquifer wells abandoned due to the proximity of construction, possibly underneath construction. Precisely locate all wells abandoned and correlate to all VEGP construction by precise location. As at the Savannah River Plant, these wells may become a pathway for contaminants to enter the confined aquifer (cf., L-Reactor EIS, discussion on well 43-A, p. F-99). Discuss.

RESPONSE: Figure 2.4.12-2 of the FSAR shows the location of makeup wells and observation wells in the vicinity of VEGP prior to 1984. That figure identifies those confined aquifer wells that have been abandoned. All such wells, whether or not located in an area to be occupied by a structure, have been sealed or will be sealed with grout,

which will prevent those wells from acting as pathways for contaminants. As stated in the Applicants' response to interrogatory B-11 of the Intervenors' Third Interrogatories, certain information concerning wells at VEGP is being compiled for the NRC staff and will be made available to the Intervenors when completed.

B-16. Well data for well 42E is missing and was not discussed by VEGP in response to IQB-25 p. 37. Provide. VEGP stated well 42B water levels are at a higher head than well 42A, and well 42C levels are lower than 42D. Explain.

RESPONSE: During the initial site exploration conducted in 1971, a nest of observation wells was constructed at site 42. The nest as originally constructed included five wells, one open to the confined aquifer beneath the marl, well 42A; two open to the marl, wells 42B and 42C; and two open to the unconfined, or water-table aquifer above the marl, wells 42D and 42E. At that early stage, the location of the water table aquifer had not been well defined. Well 42E, which was intended to monitor the water table aquifer, was not placed deep enough to reach that aquifer. The screened interval on well 42E, which was at a depth of 45 to 55 feet, was in the unsaturated zone just above the water table aquifer. The well did not register a water level and was not monitored. It was destroyed with the other observation wells in the nest when construction commenced in 1974.

The relationship of water levels in observation wells 42A, 42B, 42C, and 42D is explained in the Applicants' response to interrogatory B-25 in the Intervenors' First Set of Interrogatories.

B-17. In conjunction with all wells listed in Item 11 above, provide detailed description of each well's construction. Include surface elevation, depth, screening interval, well history, screen type, last quarterly well water level, well status, applicable closure-sealing techniques, date closed or abandoned, plus other pertinent data.

RESPONSE: Interrogatory B-17 requests the same information as previously sought by interrogatory B-11 of the Intervenors' Third Set of Interrogatories. Applicants refer Intervenors to and incorporate herein their response to that interrogatory.

B-18. Describe well/surface water monitoring techniques, e.g., sample collection, nuclides analyzed, sampling periods, and assay organization.

RESPONSE: Water quality monitoring techniques for both well and surface water are described in Section 2.4.12.1.3.4 of the FSAR and Sections 6.1.1 and 6.1.2 of the OL-ER. Radiological monitoring techniques are described in Sections 6.1.5, 6.2.1, and 6.4 of the OL-ER. Assay organizations utilized include Georgia Power Company's laboratory for water quality analysis and Teledyne and the University of Georgia for radiological analysis.

B-19. List all wells used to map the marl aquiclude under VEGP. Provide marl data from each. Describe test techniques and whether the marl material brought to the surface was through corings or cuttings. Discuss well 42E. Discuss uncertainty ranges.

RESPONSE: The extent of the marl aquiclude was determined primarily by exploratory drill holes, not wells. Volumes II and III of the VEGP Preliminary Safety Analysis Report (PSAR) contain geologic logs describing drilling and sampling methods and lithology for those drill holes. The Applicants' response to interrogatory B-2 of the Intervenors' First Set of Interrogatories describes the testing techniques and data sources used.

Well 42E is discussed in the Applicants' response to interrogatory B-16 of the Intervenors' Third Set of Interrogatories.

Applicants object to that portion of interrogatory B-19 that requests them to "discuss uncertainty ranges" on the ground that it is vague, confusing, not susceptible to a proper response.

B-20. How many wells mapped the confined aquifer underlying the VEGP (the FSAR lists only MU-1 and 2). Discuss the uncertainty in the VEGP analysis of the confined aquifer mapping.

RESPONSE: As discussed in the Applicants response to interrogatory B-1 of the Intervenors First Interrogatories, the presence of the confined aquifer at the site

was determined from various published reports concerning the geology and groundwater hydrology of the region. The sequence and depths of the different aquifers and aquicludes beneath the VEGP site were determined by site exploration as discussed in Applicants' response to interrogatories B-1 and B-24 of the Intervenors' First Set of Interrogatories and described in Sections 2.4 and 2.5 of the PSAR and FSAR. The use of observation wells in the confined aquifer to determine the contours of the piezometric surface for that aquifer system is discussed in section 2.4.12.2.3.2 of the FSAR and shown on Figure 2.4.12-6 of the FSAR.

The Applicants object to that portion of interrogatory B-20 that asks them to "discuss the uncertainty in the VEGP analysis of the confined aquifer mapping" on the ground that it is vague, confusing, and not susceptible to a proper response.

B-21. Provide the data that determined the marl was absent under the Savannah River and its flood plain (cf. Item 36 below).

RESPONSE: Data obtained from site exploratory holes and surface geologic mapping were used to develop geologic sections showing the geology in the vicinity of VEGP. These sections are shown in Figures 2.5.1-14 through 2.5.1-20 of the FSAR. The data are provided on the geologic logs of drill holes contained in the PSAR.

B-22. Explain the piezometric surface differences between the data provided in the FSAR (Figure 2.4.12-6) and that in Siple's report (p. 2.4.12-27; cf. L-Reactor EIS, p. F-22) and that in the L-Reactor EIS (e.g., p. F-22, 23, 24, etc.). Provide a clear surface map of VEGP with confined aquifer piezometric contours (cf. Item 35 below).

RESPONSE: The piezometric surfaces shown on Figures F-7 and F-8 of the L-Reactor Final EIS are interpretations of the regional configuration of the Cretaceous (Tuscaloosa) aquifer based on different sets of well data and different methods of contour interpretations, and are illustrated by twenty-foot and fifty-foot contour intervals. The contours depicted on Figure 2.4.12-6 of the VEGP FSAR illustrate the local piezometric surface of the unnamed Lisbon sands beneath the VEGP site based on observation well measurements and drawn with five-foot contour intervals. Although the maps were produced from data collected at different periods of time and from different wells, they all show that water within the confined aquifer flows toward the Savannah River in the area beneath and surrounding Plant Vogtle.

B-23. The predicted contaminant travel time to Mathes Pond of 350 years is similar to the 200-year estimate made by the Savannah River Plant for tritium to travel through

the groundwater from the SRP radwaste burial ground to an outcropping in Four Mile Creek on the SRP, a distance of about 1500 feet. The first outcrop at the SRP was found the twenty-fifth year of operation. (There is no basin in the SRP burial ground to increase flow rates.) What validation techniques were performed on the VEGP calculations of 350 years?

RESPONSE: All of the calculations for the VEGP predicted contaminant travel time were checked and reviewed. In the Draft SER for VEGP, issued on November 6, 1984, the NRC staff reported its own independent calculation of contaminant travel time. The NRC staff used a lower estimate of porosity, a higher value of permeability, and a shorter travel path (2800 feet) than the Applicants. The conclusion reached by the NRC staff, however, was that VEGP "meets the requirements of 10 CFR Part 100 with respect to potential accidental release of radioactive effluents."

The Applicants do not have the data used by the SRP to determine the 200 year estimate of travel time, and therefore cannot conduct their own analysis of that data. The "Annual Summary of Burial Ground Grid Well Assays - 1980," dated October 10, 1981, however, does indicate that erosion caused by cooling water discharges shortened the flow path used in the SRP estimate by more than 50%.

While the original flow path was approximately 1700 feet "the erosion of the effluent channel had advanced the natural outcrop zone toward the burial ground by about 1000 feet, causing premature release of tritium contaminated water."

B-24. RE: VEGP Response to IQB-2: Provide the laboratory permeability tests conducted on core samples from marl exploration holes; provide core sampling techniques, core sample depths, core sample locations and other pertinent data. Provide field test correlations for the same core sample locations.

The VEGP power block excavation exposed an upper 25 feet of marl with a surface area of about one million square feet exposed, approximately one-third of one percent of the VEGP areal site. Provide the uncertainty ranges in asserting that there are no voids, dissolution cavities, systematic fractures, or joints (exclusive of the multiple penetrations through the marl by confined aquifer observation and production well) that would provide a path for movement of groundwater contamination through the marl. Provide the uncertainty ranges inclusive of marl well penetration.

Discuss the consistently large water level differences in light of the lack of correlation between the active, confined aquifer observation well water levels. Why do the confined aquifer water levels vary and what is the source of variability?

RESPONSE: The laboratory permeability tests referred to in the Applicants' response to interrogatory B-2 of the Intervenors' First Set of Interrogatories were conducted on core samples of the sands above the marl. No laboratory tests were conducted on core samples from the marl. The exploration core drilling was conducted according to the specifications outlined in the contract with the drilling contractor, which follow the ASTM D 2113 standard method procedures. The geologic logs of drill holes contained in the PSAR and FSAR show the information requested concerning sample depths and locations.

Applicants object to the second paragraph of interrogatory B-24 to the extent that it asks the Applicants to "provide the uncertainty ranges" on the ground that it is vague, confusing, and not susceptible to a proper response. Subject to that objection, Applicants state that the effectiveness of the marl as an aquiclude has been demonstrated to a very high degree of confidence by a variety of methods, as discussed in the Applicants' response to interrogatory B-2 of the Intervenors' First Set of Interrogatories. The marl has been studied by means of packer permeability tests in the field, numerous drill holes, and detailed geologic mapping of the large areas exposed during excavation. These studies did not reveal geologic features that would provide a path for potential contaminants to migrate from the water table aquifer to the

deeper confined aquifers. This lack of structures in the marl that would provide a path for movement of ground water contamination is verified by the consistent difference in water levels in the unconfined and confined aquifers as shown in Figures 2.4.12-6 and 2.4.12-7 of the FSAR.

Water levels in observation wells open to the confined aquifer will vary in response to changes in recharge and discharge rates. Other factors such as pumping and barometric pressure also play a part.

B-25. RE: VEGP Response to IQB-6: VEGP has made many technical statements and drawn numerous technical conclusions based on esoteric assumptions and recondite theories. The technical conclusions cannot be assailed without validation from two perspectives, either by finding groundwater contamination in the VEGP aquifers in the future or by showing that similar technical conclusions at other facilities have been contraverted. Groundwater contamination at the nearby Savannah River Plant and at Plant Hatch are relevant. Provide the Plant Hatch information requested in IQB-6 but expand it to include all US electric generating power stations and all radionuclide and contaminants released at each site (cf. VEGP Response p. 92 where VEGP uses effluent data from other sites as part of VEGP's own technical statement).

RESPONSE: Applicants object to interrogatory B-25 on the following grounds:

(1) interrogatory B-25 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-25 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-25 is overly broad, unduly burdensome, and oppressive, and providing the requested information would necessitate an unreasonable and costly expenditure of time, effort, and research by Applicants.

B-26. RE: VEGP Response to IQB-7: What financial assurances exist that VEGP will be able to fund not only the post-operational environmental radiological and chemical monitoring programs associated with decommissioning the VEGP plant but also the cleanup of contaminated soil and groundwater at VEGP. Since the predominant well pattern in the area surrounding VEGP indicates primarily groundwater table well users (FSAR), what steps will VEGP take to financially and technically return the 3000 plus acre VEGP facility back to public domain free of radionuclide and hazardous waste contamination in water table aquifer?

RESPONSE: Applicants object to interrogatory B-26 on the following grounds:

(1) interrogatory B-26 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-26 requests information beyond the scope of those matters identified as being in controversy in this proceeding by the ASLB in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2-715a, since the Board did not admit proposed Contention 3 submitted by Campaign for a Prosperous Georgia; and

(3) interrogatory B-26 requests information concerning the financial qualifications of the Applicants in contravention of 10 C.F.R. § 50.33(f) and 10 C.F.R. § 50.40(b), which have eliminated as an issue in an operating license application proceeding the financial qualifications of an electric utility applicant.

B-27. RE: VEGP Response to IQB-18(c): The Savannah River Plant emissions of NOx, SOx, and TSP have been found to be within 20 to 80 percent of acceptable SRP boundary release limits measured at 30 to 40 kilometers from plant center southwest of the VEGP site. VEGP on the other hand

is only fifteen km from SRP plant center, a likely location for SRP airborne hazardous and radionuclide depositions. Also, strontium-90 released from SRP in concentrations already exceeding EPA drinking water standard have been found in milk at Waynesboro, Georgia, 45 km from the SRP plant center. VEGP is between Waynesboro and SRP. Therefore cumulative effects are relevant. Please respond to IQB-18(c).

RESPONSE: Applicants object to interrogatory B-27 on the following grounds:

(1) interrogatory B-27 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-27 seeks information beyond the scope of those matters identified as being in controversy in this proceeding by the ASLB in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a, since the Board rejected proposed Contention 2 submitted by Georgians Against Nuclear Energy, which dealt with the cumulative effects of radioactive releases from Plant Vogtle and the Savannah River Plant.

B-28. Locate water table aquifer divides on a clearly understandable VEGP surface map with noted boundary locations.

RESPONSE: A groundwater divide is defined as "a ridge in the water table or other potentiometric surface from which the groundwater represented by that surface moves away in both directions." Glossary of Geology, American Geological Institute, Washington, D.C., 1972. Groundwater divides in the water table aquifer beneath the VEGP site can be interpreted from Figure 2.4.12-7 (sheet 1 of 2) of the FSAR.

B-29. RE: VEGP Response to IQB-27, p. 39: VEGP states that the marl is an aquiclude and that the Cretaceous Aquifer is confined and isolated from VEGP releases. The Savannah River Plant made similar assurances in 1976 (C.H. Ice). What range of uncertainty exists with this VEGP claim? VEGP assumes a marl is nonexistent under the Savannah River and that contaminants migrating in the water table aquifer would not penetrate the Tuscaloosa Aquifer underlying the Savannah River because of higher head differentials between the Tuscaloosa and the Savannah River. SRP has made similar assurances in the past but contamination has been found in Tuscaloosa wells. What range of uncertainty exists with the VEGP claim that the Tuscaloosa will be open under the Savannah River alongside VEGP but that downward contamination flow will be prevented.

RESPONSE: Applicants object to interrogatory B-29 on the ground that it is vague, confusing, and not susceptible to

a proper response since Applicants do not know what Intervenors mean by "range of uncertainty." Also, the head differentials between the Cretaceous (Tuscaloosa) aquifer and the Savannah River have no connection with contamination found in wells at the SRP.

Subject to that objection, the effectiveness of the Blue Bluff marl as a barrier to groundwater movement has been investigated through several avenues of study as described in the Applicants' response to interrogatory B-2 of the Intervenors First Set of Interrogatories. The extent of those studies and the consistency in the results obtained provide a sound basis for concluding that the marl is effectively impermeable and will act as a barrier to groundwater movement.

A reversal of the present direction of the potential hydraulic gradient between the Cretaceous aquifer and the Savannah River would require either a very large reduction in the available recharge to the aquifer, or a very large increase in extractions from the aquifer in the vincinity of the VEGP. Neither of these possibilities is credible.

B-30. RE: VEGP Response to IQB-31, p. 42: VEGP states that Cretaceous Aquifer water withdrawal will not affect the probability that a fluid spilled at the VEGP site would reach the groundwater. The Savannah River Plant has made similar assurances in the past and has found and reported this to be no longer true in their L-Reactor EIS. Defend the Applicants' position.

RESPONSE: The Applicants have not been able to find any reference in the L-Reactor Final EIS to the withdrawal of water from the Cretaceous aquifer affecting the probability that contaminants would reach groundwater. The basis for the Applicants' statement that withdrawal of water from the Cretaceous aquifer will not affect the probability that a fluid spilled at the VEGP site would reach the groundwater is set forth in their response to interrogatory B-31 of the Intervenors' First Set of Interrogatories.

B-31. RE: VEGP Response to IQB-32: What validated VEGP assurance exists that the concrete basin and settlement pond will not become sources of groundwater contamination (cf. Item 26 above).

RESPONSE: The concrete basins mentioned in the Applicants' response to interrogatory B-32 of the Intervenors' First Set of Interrogatories will contain cooling water that has not been exposed to radioactive contaminants. The two settlement or sediment ponds at Plant Vogtle, while used for runoff during construction of VEGP, will not receive discharges of plant waste water effluents during the operation of the plant.

B-32. RE: VEGP Response to IQB-27: VEGP states that the VEGP site is located on an interfluvial high bounded by stream channels that have cut down to the marl. The FSAR surface topographs of VEGP are not clear but appear

to indicate that VEGP is not bounded on all sides by stream channels and that channels cut inward into the site at numerous, various angles. Please explain the VEGP contention.

RESPONSE: The Applicants described the stream channels bounding and isolating the VEGP site on an interfluvial high in their response to interrogatory B-27 of the Intervenors' First Set of Interrogatories. While those stream channels are not interconnected so as to form a continuous channel around the VEGP site, the water table aquifer beneath the VEGP site flows in the direction of and discharges into those streams. In conjunction with the Blue Bluff marl, those stream channels isolate the water table aquifer beneath the plant on an interfluvial high. Section 2.4.12.1.1 of the Draft ES reflects the NRC staff's agreement with the Applicants' characterization of the water table aquifer at the site as isolated on an interfluvial high.

B-33. FSAR Figure 2.4.12-2 shows about 47 wells with about 24 wells abandoned. The data does not appear to agree with other tabulated, written data. In conjunction with Item 11 above, update this figure and include VEGP complete site boundaries with surface stream locations and surface stream sample locations on a clear depiction (see FSAR figure 2.4.12-4 and Items 11 and 12 above).

RESPONSE: Applicants object to interrogatory B-33 on the grounds that it requests the same information as interrogatories B-11 and B-12 of Intervenors Third Set of Interrogatories. Applicants refer the Intervenors to and incorporate herein their responses to those interrogatories.

B-34. Provide a complete site listing of piezometers (see FSAR Figure 2.4.12-3) and the precautions taken to prevent piezometer contaminant entry into aquifers. Include piezometer construction details by piezometer.

RESPONSE: The LT and ST series "piezometers" shown on FSAR Figure 2.4.12-3 are observation wells. These wells did not penetrate an aquifer but were installed in the backfill to monitor water levels during backfill operations.

B-35. FSAR Figure 2.4.12-6 appears to indicate that only 7 observation wells mapped piezometric surface of the confined aquifer. Compare this data with the L-Reactor EIS pages F-22, 23, 24, etc. and explain differences in the piezometric contours between the data sets. Provide piezometric confined aquifer contours on a map of the VEGP site outward a radius of at least ten kilometers. Figure 2.4.12-6 appears to indicate that 9 wells were used in the VEGP confined aquifer mapping. Explain the differences between 2 VEGP mappings--the data presented does not lend itself to careful analysis (cf. Item 22).

RESPONSE: Applicants object to the first part of interrogatory B-35 on the ground that it duplicates interrogatory B-22 of the Intervenors' Third Set of Interrogatories. Applicants refer Intervenors to and incorporate herein their response to that interrogatory.

With respect to the second part of interrogatory B-35, Figure 7-20 of the Studies of Postulated Millett Fault and Figures F-7 and F-8 of the L-Reactor EIS are piezometric contour maps of the confined aquifer covering an area of more than 20 miles radius from the VEGP site. The two piezometric maps shown on sheet 1 and sheet 2 of Figure 2.4.12-6 of the FSAR (which have been combined in Amendment 9 to the FSAR dated August 1984) depict piezometric surfaces at different periods. Sheet 1 is based on water level measurements made in October 1971 and Sheet 2 on measurements made in March 1980.

B-36. VEGP has stated the marl depth is 130 feet below the surface. Confined aquifer well 34 does not support this contention. Which wells do and which do not? Why was well 34 located in the river flood plain? Well 34 appears to be on the VEGP site (FSAR Figure 2.4.12-6) and appears to contradict the VEGP argument about the VEGP site located on an interfluvial high. Provide a detailed explanation of where the VEGP interfluvial high is theoretically intact and where not

intact and relate to the VEGP geography over the entire surface and to the marl underlying VEGP. Explain where marl boundaries are located.

RESPONSE: The topographic relief at the site results in variation in the depth from the surface to the marl. Figure 2.5.1-30 of the FSAR shows the site topography and the elevation of the top of the marl, which varies as well. That figure also shows the relationship between the top of the marl and well 34. This well was drilled to provide data on ground water adjacent to the Savannah River. As stated in the Applicants' response to interrogatory B-27 of the Intervenors' First Set of Interrogatories, the Savannah River is one of the bounding channels of the interfluvial high on which Plant Vogtle is located.

B-37. RE: VEGP Response to IQ-R-2: VEGP states predicted drift deposition rates are based on a range of drift rates predicted for five similar power plants. The Savannah River Plant uses mostly unvalidated predictions to estimate airborn release concentrations, concentrations found to be orders of magnitude low. What validations have been performed on the VEGP drift rate deposition models? Provide detailed validations and compare to the deposition model predictions (cf. VEGP Response to IQ-R-7). Provide the mathematical calculations used in the VEGP models.

RESPONSE: As discussed in the Applicants' response to interrogatory R-7 of the Intervenors' First Set of Interrogatories and in the September 25, 1984 letter to the NRC referenced in that response, the Applicants derived their salt drift deposition rates for VEGP by means of a bounding methodology. The Applicants determined maximum predicted deposition rates for five other similar plants and adjusted those rates to VEGP conditions, producing a range of estimated deposition on-site and off-site rates, the maximum of which were used as the estimated on-site and off-site salt deposition rates for VEGP. While the five similar plants used computer models to calculate their predicted deposition rates, no modeling had been done for VEGP at the time the Applicants responded to the Intervenors' First Set of Interrogatories.

Subsequently, however, the Applicants contracted with NUS Corporation to model the performance of the VEGP natural draft cooling towers to predict site specific drift mineral deposition. The results of that modeling are reported in "An Evaluation of Cooling Tower Drift Deposition at the Vogtle Electric Generating Plant," dated January 29, 1984. That report concludes that:

> The operation of two units of the Vogtle Electric Generating Plant in accordance with expected design and performance parameters will not result in a detectable addition to the natural environment in respect to deposition. This conclusion confirms the earlier analysis by the Applicant

using an extrapolation of the predicted performance of other plants with natural draft cooling towers, an analysis much more conservative than the site-specific drift deposition analysis reported herein. The best estimate of the deposition of solids from the drift of two cooling towers at the downwind site boundary is a value of less than one pound per acre-year.

The results of the modeling study performed by NUS Corporation for VEGP replace the Applicants' prior estimates of salt drift deposition rates for VEGP.

Applicants object to that part of interrogatory B-37 that requests them to "provide the mathematical calculations used in the VEGP models" on the ground that it seeks information that is confidential or proprietary in nature. The Applicants will produce for inspection and copying by the Intervenors the mathematical calculations made by Bechtel Power Corporation in deriving estimated salt drift deposition rates for VEGP provided that an agreement protecting this proprietary information from disclosure suitable to all parties can be entered into between Bechtel Power Corporation and the Intervenors.

B-38. RE: VEGP Response to IQ-R-9: The VEGP DES states that cooling tower airborne releases will have moisture contaminant concentrations approximately equal to the circulating water contaminant concentrations in DES Table 4-5. Since some of the table 4-5 characteristics appear to exceed to or closely approximate the EPA drinking water standards, provide deposition model predictions on

all VEGP radioactive and chemical effluent characteristics and predicted groundwater contaminations (analogous to the SRP airborne tritium releases where SRP burial ground background groundwater concentrations thirty feet beneath the surface 2 km upwind the predominant wind approximately equal the airborne release concentration). Validate these VEGP predictions.

RESPONSE: The concentrations of the various chemical constituents of the natural draft cooling tower blowdown from DES Table 4.5 were compared to EPA's Interim Primary (10 C.F.R. § 141.11) and Secondary (10 C.F.R. § 143.3) Drinking Water Regulations. The results of this comparison are shown below.

Constituent	Natural Draft Cooling Tower Blowdown		Interim Primary	Secondary
	Average	Maximum		
TDS (mg/l)	240	360	-	500
Iron	1	2	-	0.3
Copper (mg/l)	less than 0.1	less than 0.1	-	1
Lead (mg/l)	less than 0.1	less than 0.1	0.05	-
Zinc (mg/l)	0.1	0.2	-	5
Mercury (mg/l)	less than 0.01	less than 0.01	0.002	-
Chlorides (mg/l)	20	30	-	250
Chromium (mg/l)	less than 0.1	less than 0.2	0.05	-
Nitrate (mg/l)	1.0	2.0	10	-

Any drift deposition of these chemical constituents directly on streams or rivers will be quickly diluted to background concentrations. Only iron, lead, mercury, and chromium approach or exceed EPA's Drinking Water Regulations. The maximum percentage by weight of these constituents of the total dissolved solids are given below.

Constituent	% by weight of TDS
Iron	0.556
Lead	0.028
Mercury	0.003
Chromium	0.056

If the drift deposition rate were as high as 2 pounds/acre/year (see the Applicants' response to interrogatory B-37 of the Intervenors' Third Set of Interrogatories), then the approximate deposition by weight of these constituents would be:

Constituent	Deposition rate-pounds/acre/year
Iron	0.01112
Lead	0.00056
Mercury	0.00006
Chromium	0.00112

Potential airborne radioactive emissions from the VEGP and associated environmental impacts are addressed in Sections

3.5, 5.2, 7.1, and 7A of the OL-ER and in Sections 5.9, 5.10, and 5.11 of the Draft ES.

B-39. In "Applicants' Response," p. 34, Applicants argue that IQB-22 is irrelevant and outside the scope of this proceeding. By the nature of its response (that it has studied coliform and some chemical content of some wells), Applicant demonstrates the relevance of this request. Please provide the response to IQB-22.

RESPONSE: Applicants refer Intervenors to their response to interrogatory B-22 of the Intervenors' First Set of Interrogatories, including the objections stated therein.

B-40. To IQ H-1, H-2, H-3 and H-4, Applicants argue that the questions are irrelevant and outside the scope of this proceeding. To the extent that multiconductor configurations are affected in different ways than single conductor configurations (subcontention 10.3), this is relevant and within the scope of this proceeding. Please provide the response to IQ H-1, H-2, H-3 and H-4.

RESPONSE: Applicants object to interrogatory B-40 on the following grounds:

(1) interrogatory B-40 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-40 requests information outside the scope of those matters identified as being in controversy in this proceeding by the ASLB 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, which concerned synergism, for litigation in this proceeding.

In further response to interrogatory B-40, the Applicants refer the Intervenors to their responses to interrogatories H-1, H-2, H-3, and H-4.

B-41. To IQ H-5 Applicants argue that the question is irrelevant and outside the scope of this proceeding. To the extent that some synergism affects multiconductor configuration and solenoid valves, it is relevant and within the scope of this proceeding. Similar relevance holds for IQ I-1 and I-2. Provide responses to IQ H-5, I-1 and I-2.

RESPONSE: Applicants object to interrogatory B-41 on the following grounds:

(1) interrogatory B-41 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-41 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, since the Board did not admit subcontention 10.2, which concerned synergism, for litigation in this proceeding.

In further response to interrogatory B-41, the Applicants' refer the Intervenors to their responses to interrogatory H-5 and to requests to produce I-1 and I-2 of the Intervenors' First Set of Interrogatories and Requests to Produce.

B-42. To IQ L-1, Applicants argue that the question is irrelevant and outside the scope of this proceeding except for ASCO solenoid valves. In fact, the ASLB order does not limit this subcontention to ASCO solenoid valves, nor did the intervenors limit the subcontention to ASCO. The contention made by intervenors raises the question of environmental qualification of all solenoid valves, not just ASCO; the ASLB implicitly acknowledges this in its order's reference to "solenoid valves used at Vogtle," not "ASCO solenoid valves used at Vogtle." Please provide the response to IQ L-1. For the same reasons, please provide the response to IQ L-2, L-3, L-4, and M-1 which are follow-ups to L-1.

RESPONSE: Applicants refer Intervenors to their responses to interrogatories L-1, L-2, L-3 and L-4 and to request to produce M-1 of the Intervenors' First Set of Interrogatories and Requests to Produce and the objections stated therein.

B-43. To IQ N-4, Applicants argue that the question is irrelevant and outside the scope of this proceeding. In fact, operating experience of this type recombiner is

fundamentally relevant since this type recombiner is to be used at Vogtle. Question N-5, a follow-up, is similarly relevant. Please provide the responses to IQ N-4 and N-5.

RESPONSE: Applicants object to interrogatory B-43 on the following grounds:

(1) interrogatory B-43 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-43 asks for information beyond the scope of those matters identified as being in controversy in this proceeding by the ASLB in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a.

Applicants also refer the Intervenors to their responses to interrogatories N-4 and N-5 of the Intervenors' First Set of Interrogatories.

B-44. In response to IQ N-6, Applicants argue that the question is irrelevant and outside the scope of this proceeding. In fact, maintenance and surveillance during operations are crucial to assure that equipment is environmentally qualified, since operation of the facility could have an effect on the environmental qualification of the equipment. Surely, the Applicants plan some sort of maintenance and surveillance program; for this equipment; Intervenors merely ask what it is. Please provide the response to IQ N-6.

RESPONSE: Applicants object to interrogatory B-44 on the following grounds:

(1) interrogatory B-44 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-44 asks for information beyond the scope of those matters identified as being in controversy in this proceeding by the ASLB in its Memorandum and Order on Special Prehearing Conference Held Pursuant to 10 C.F.R. 2.715a.

Applicants also refer the Intervenors to their response to interrogatory N-6 of the Intervenors' First Set of Interrogatories.

B-45. In response to IQ P-2, Applicants argue that the question is irrelevant and outside the scope of this proceeding. However, this is relevant to the extent that it applies to bubble collapse and vibration-induced fatigue cracking. Within these confines, please provide a response to IQ P-2.

RESPONSE: The Applicants object to interrogatory B-45 on the following grounds:

(1) interrogatory B-45 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 B-45 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 these objections, the Applicants further respond to interrogatory B-45 by stating that tube failures resulting from vibration-induced fatigue cracking or bubble collapse have not been observed in any Westinghouse designed steam generators.

B-46. In response to IQ P-3, Applicants argue that the question is irrelevant and outside the scope of this proceeding. In fact, the maintenance and surveillance program is relevant to the degree that it affects the possibility of vibration-induced fatigue cracking and bubble collapse. Within these confines, please provide the response to IQ P-3.

RESPONSE: Applicants object to interrogatory B-46 on the following grounds:

(1) interrogatory B-46 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 B-46 asks for information beyond the scope of those matters identified as being in controversy in this proceeding by the ASLB 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 these objections, the Applicants further respond to interrogatory B-46 by stating that tube failures resulting from vibration-induced fatigue cracking or bubble collapse have not been observed in any Westinghouse designed steam generators.

B-47. In response to IQ P-4, Applicants argue that the question is irrelevant and outside the scope of this proceeding. In fact, procedures for emergency action in steam generator tube rupture are relevant since the Applicants have not demonstrated basis for confidence that such an accident will not occur (cf. ASLB order). IQ P-5, P-6, Q-1 and Q-2 are similarly relevant. Please provide responses to IQ P-4, 5 and 6 and Q-1 and 2.

RESPONSE: Applicants object to interrogatory B-47 on the following grounds:

(1) interrogatory B-47 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 B-46 requests 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 CFR 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 these objections, the Applicants further respond to interrogatory B-47 by stating that tube failures resulting from vibration-induced fatigue cracking or bubble collapse have not been observed in any Westinghouse designed steam generators.

B-48. In response to IQ R-9, Applicants argue that the question is irrelevant and outside the scope of this proceeding. This is directly relevant to the ASLB order in regard to groundwater and to cooling tower emissions. Please provide a response to IQ R-9.

RESPONSE: Applicants refer the Intervenors to their response to interrogatory R-9 of the Intervenors' First Set of Interrogatories and the objections stated therein.

B-49. In response to IQ R-4 and S-3, "Applicants interpret [chlorine to mean] chlorine gas." In fact, chlorine emissions in general are within the scope of the contention, and Intervenors request that Applicants provide this response for all chlorine.

RESPONSE: Chlorine is added to the makeup water and circulating water systems to destroy the organic growths which may foul piping and heat transfer surfaces in the cooling water systems. The procedures call for the addition of sufficient chlorine to produce a residual "free available chlorine" (FAC) in the circulating water. This "free available chlorine" is not chlorine gas, but "the concentration of unreacted hypochlorous acid and hypochlorite ions existing in the chlorinated water." White, Handbook of Chlorination, p. 190. The magnitude of FAC maintained in the circulating water will be about 0.2 mg/liter, except during the Corbicula spawning season when a FAC of 1.0 mg/liter will be maintained. OL-ER § 3.6.1.1 Amendment 2.

As described in Section 9.3.7 of the FSAR and Section 3.6.1.1 of the OL-ER, chlorine gas is dissolved in water and added to the water systems at two locations. The first addition point is at the river makeup water intake and the second is at the intake of the circulating water pumps in the condenser cooling water system. In both instances the chlorine added is immediately hydrolyzed and begins to react with those substances in the water which exercise a "chlorine demand" as described below. The chlorine will exist either as HOCl (hypochlorous acid), as OCl^- (hypochlorite ion), or as (reacted) hypochlorites or chlorides.

The distribution between the hypochlorous acid and hypochlorite ion is a function of temperature and pH and can be calculated as follows:

$$(HOCl)/[(HOCl)+(OCl-)] = 1/[1+(Ki/(H+))]$$

where (HOCl),(OCl-), and (H+) are molar concentrations and Ki is the ionization constant which varies with temperature. White, p. 185. For a pH of 7.5, the fractions of FAC represented by HOCl at temperatures of 89 and 122 degrees Fahrenheit (the cold and hot water temperatures, respectively) are 0.43 and 0.37, respectively.

Chlorine demand is produced by those constituents of the raw and circulating water which combine with or form complexes with chlorine to create a form other than FAC. These other forms may be "combined residual chlorine" (CRC) or some chlorine-containing compounds which cannot be defined as CRC. Chlorine which has been reduced to chloride by any reductant, or which has been combined with organic compounds by oxidation or substitution is not considered to be any part of the total residual chlorine (TRC) which is the sum of FAC and CRC.

The breakpoint chlorine demand of the Savannah River water has been measured (GPC, PLANT VOGTLE Makeup Water Study, 1978) and has indicated on average, the requirement for a dosage of about 5.5 mg/liter to produce a FAC residual of 1 mg/liter in the river water. That value

might be used as one basis for estimating the quantities and the significance of potential discharges from the cooling tower of these chlorination products. To provide a maximum worst case emission and deposition evaluation, this analysis uses the maximum addition of chlorine specified in Section 3.6.1.1 of the OL-ER.

As indicated in the Table 9.3.7-1 at the FSAR, the River Water Chlorination System has two 6000 lb per day chlorinators and the Circulating Water Chlorination System, three 10,000 lb per day chlorinators. With an average makeup flow rate of 20,000 gallons per minute per unit, the two river water chlorinators can add about 25 ppm of chlorine to the makeup water. However, Section 3.6.1.1 of the OL-ER indicates that chlorination will be continuous up to a level of 10 mg/liter during the Corbicula spawning season to maintain a FAC residual of 1 mg/liter; this dosage would be continued for a period of about one week per month. The maximum concentration produced in the condenser cooling water flow of 484,600 gallons per minute by a 10,000 lb per day chlorinator is about 1.7 mg/liter.

To provide for maximum emissions, conservative estimates have been made of the distribution of the chlorine derivatives. It is assumed that all of the added chlorine except for the FAC and CRC is present as chloride

ion, and adds to the dissolved chlorides already introduced into the system by the makeup river water (about 5 mg/liter). It is further assumed that the CRC is composed of 0.6 mg/liter of monochloramine formed by the reaction of the hypochlorous acid with the 0.21 mg/liter ammonia contained in the makeup water. Table 3.7-1 of the CP-ER.

Of the 1.67 lbs of chlorine added per minute to the makeup water from the river, about 0.083 lbs per minute is assumed to combine with the ammonia to form monochloromine; 1.59 lbs per minute is assumed to become chloride ion. Of the 6.94 lbs per minute added to the circulating water, all but the amount producing the FAC of 1.0 mg/liter adds to the chlorine-derived chlorides. The FAC and CRC are assumed to follow the behavior of the circulating water passing through the cooling tower; i.e., the fraction carried into the vapor phase will be the same as the fraction of water evaporated.

Assuming operation of the cooling tower at four cycles of concentration, the added "chlorides" would increase the blowdown (and drift) dissolved solids concentration at equilibrium from 240 mg/liter to about 440 mg/liter (an unrealistically high value), and increase the drift mineral deposit by the same proportion (440/240). Thus, if the practice were to be continuous on a year-round basis, the previously estimated maximum drift deposition from both towers of 1.7 pounds per acre-year [See "An

Evaluation of Cooling Tower Drift Deposition at the Vogtle Electric Generating Plant"] would increase to about 3.1 pounds per acre-year. However since such a high dosage practice would occur for one week per month per unit from April to November [Response to NRC Question 291.15], for an equivalent of 2 months per unit year, the maximum deposition value would increase to 1.7 + 1.4/3, or 2.17 lbs per acre-year.

The FAC and CRC in the circulating water are assumed to be lost to the atmosphere with that fraction (15,000 gpm) that evaporates; at a concentration of 1 mg/liter of FAC and 0.5 mg/liter of CRC, the evaporate would transfer 15,000 gpm X 8.345 lb/gal X 1.5 lb (FAC+CRC)/1,000,000 lb water = 0.19 lb/minute of FAC and CRC. As vapors these materials would be dispersed as gases and not deposit on the ground as promptly, or at as high a deposition density as the drift droplets. However to be conservative, it is assumed that the FAC and CRC deposited would follow the deposition patterns of minerals originating in the liquid drift droplets. Since the emission rate of those minerals leading to the maximum drift deposition estimate of 1.7 lb/acre-year is 0.155 lb/min, it can be estimated that the upper limit of FAC and CRC deposited would be at a rate of (.19/.155) X 1.7 = 2.1 lb/acre-year per unit. Again, since this maximum chlorination practice occurs for an equivalent of 2 months per year per unit, the maximum

increment would be about 0.69 lb/acre-year with the highly conservative deposition assumption.

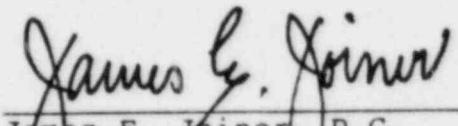
Adding these "chlorination" contributions at the maximum location (0.47 lb/acre-year from added "chlorides" plus 0.69 lb/acre-year from the FAC and CRC) to the (approximately) 8% of the drift mineral comprised of the chloride ion from the river makeup water (0.14 lb/acre-year) yields a maximum estimated "chloride" deposition of about 1.3 pounds per acre per year. This value is well below any level of significance to vegetation. See Draft ES at 5-11.

B-50. In response to IQ S-4, Applicants state that Intervenors can get a computer printout or computer tape for $500 to $1000. Do the Applicants not use this data? If the response is Yes, then why cannot Intervenors examine this at some time when it would not interfere with the Applicants' use of it? If the response is No, then why do the Applicants maintain the data?

RESPONSE: The raw data from the meteorological tower at Plant Vogtle is stored on magnetic computer tape. This data is periodically used by the Applicant's meteorological consultant, Pickard, Lowe & Garrick in both the printout and magnetic tape form. Applicants will provide Intervenors with a printout or magnetic tape of that data provided the Intervenors agree to pay the cost, which the Applicants estimate to be $500 to $1,000 Or the

Intervenors may inspect the printout at the offices of Pickard, Lowe & Garrick in Washington, D.C. at a time convenient to both parties.

Respectfully submitted,



James E. Joiner, P.C.
Charles W. Whitney
Kevin C. Greene
Hugh M. Davenport
TROUTMAN, SANDERS, LOCKERMAN & ASHMORE

George F. Trowbridge, P.C.
Bruce W. Churchill, P.C.
David R. Lewis
SHAW, PITTMAN, POTTS & TROWBRIDGE

Counsel for Applicants

DATED: February 13, 1985.

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)	:	

CERTIFICATE OF SERVICE

I hereby certify that copies of Applicants' Response to Intervenors' Third Set of Interrogatories and Request for Production of Documents, dated February 13, 1985, 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 13th day of February, 1985.

James E. Joiner

James E. Joiner, P.C.
Counsel for Applicants

Dated: February 13, 1985

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)	:	

SERVICE LIST

Morton B. Margulies, Chairman
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gustave A. Linenberger
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dr. Oscar H. Paris
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Bernard M. Bordenick, Esquire
Office of Executive Legal Director
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Atomic Safety and Licensing Appeal
Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Docketing and Service Section
Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Douglas C. Teper
1253 Lenox Circle
Atlanta, Georgia 30306

Jeanne Shorthouse
507 Atlanta Avenue
Atlanta, Georgia 30315

Laurie Fowler & Vickie Breman
Legal Environmental Assistance
Foundation
1102 Healey Building
Atlanta, Georgia 30303

Tim Johnson
Campaign for a Prosperous Georgia
175 Trinity Avenue, S.W.
Atlanta, Georgia 30303

Carol A. Strangler
425 Euclid Terrace
Atlanta, Georgia 30307

Dan Feig
1130 Alta Avenue
Atlanta, Georgia 30307

Bradley Jones, Esq. (Regional Counsel)
U.S. Nuclear Regulatory Commission
Suite 3100, 101 Marietta Street
Atlanta, Georgia 30303