



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D. C. 20555

January 30, 1985

Docket Nos: 50-424  
and 50-425

Mr. Donald Foster  
Vice President and Project General Manager  
Georgia Power Company  
P.O. Box 299A, Route 2  
Waynesboro, Georgia 30830

Dear Mr. Foster:

Subject: Draft Environmental Statement Comments

As specified in the Council on Environmental Quality regulations, we have requested federal, state, and local agencies to comment in connection with the Draft Environmental Statement for the Vogtle Electric Generating Plant, Units 1 and 2.

The enclosure to this letter contains a list of comments received to date and transmitted herewith. This information supplements that forwarded to you by letter dated January 16, 1985.

Please review these comments and submit any responses you deem appropriate by February 8, 1985.

Sincerely,

A handwritten signature in cursive script that reads "Elinor G. Adensam".

Elinor G. Adensam, Chief  
Licensing Branch No. 4  
Division of Licensing

Enclosures:

As stated

cc w/encl:

See attached list

DESIGNATED ORIGINAL

Certified By

A handwritten signature in cursive script that reads "Angela Hatten".

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VOGTLE

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List of Comments Transmitted

1. U S Department of Agriculture letter dated November 30, 1985
2. Educational Campaign for a Prosperous Georgia letter dated January 4, 1985
3. Educational Campaign for a Prosperous Georgia letter dated January 7, 1985
4. U S Environmental Protection Agency letter dated January 10, 1985
5. William Lawless letter dated January 11, 1985 (replaces handwritten comments dated January 7, 1985 which are not forwarded)
6. U S Department of the Interior letter dated January 22, 1985



United States  
Department of  
Agriculture

Economic  
Research  
Service

Washington, D.C.  
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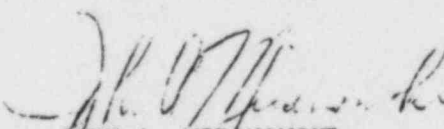
November 30, 1984

Ms. Elinor G. Adensam  
Chief, Licensing Branch No. 4  
Division of Licensing  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Ms. Adensam:

Thank you for forwarding the Draft Environmental Statement, concerning the issuance of operating license to the Georgia Power Company, Oglethorpe Power Corporation, the Municipal Electric Authority of Georgia, and the City of Dalton, Georgia for operation of the Vogtle Electric Generating Plant, Units 1 and 2. The facility is located in the eastern sector of Burke County, Georgia.

We have reviewed Docket Numbers 50-424 and 50-425 and have no comments.

  
JOHN A. MIRANOWSKI  
Director, Natural Resource  
Economics Division

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# Educational Campaign for a Prosperous Georgia

175 Trinity Ave. S.W., Atlanta, Georgia 30303 404-659-6675

## COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT

RELATED TO THE OPERATION OF VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2

U. S. Nuclear Regulatory Commission

NUREG-1087

Georgia Power Company, et al.

Submitted by

Campaign for a Prosperous Georgia

and

Educational Campaign for a Prosperous Georgia

January 4, 1985

### Biographical Background and Summary of Qualifications

The Campaign for a Prosperous Georgia and the Educational Campaign for a Prosperous Georgia are nonprofit organizations concerned about Georgia's economic and environmental future. They have thousands of supporters in more than fifty communities in all parts of Georgia. They are signed up with the organizations:

For a list of references, see the biography of Tom Johnson, Executive Director of both organizations. He has been employed in research and technical positions with the Georgia Public Service Commission, the Georgia Consumers' Utility Counsel, the Southern Nuclear Council, the Georgia Public Interest Research Group, Magnolia Oil Company and United Oil Industries. He has authored articles on the utility industry. He has served on a Nuclear Regulatory Commission advisory panel on decommissioning of nuclear power plants. He has served as Executive Director of Campaign for a Prosperous Georgia since the organization was founded in January of 1983.

### Summary of Comments

Plant Vogtle presents a clear danger to the economy and the environment of the state of Georgia. If operated and placed into the rate base, it would cause unprecedented electric rate increases, economic dislocation, rising unemployment, shutting down of industry and small business, inflation and related problems and it could cause unprecedented environmental damage, threaten endangered species, destroy agricultural areas and present the largest human-created environmental catastrophe in history.

The Draft Environmental Statement (DES) issued by the Office of Nuclear Reactor Regulation of the Nuclear Regulatory Commission (NRC) is unacceptable in that it fails to address adequately many of the environmental impacts of the proposed construction of Plant Vogtle. It fails to consider adequately the significant changes in the environment that will result from the construction of the plant. It fails to

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consider the fact that the plant is clearly not needed, it fails to consider alternatives which are superior both environmentally and economically, and for other reasons.

### -Specific Comments

Originally issued a construction permit for Plant Vogtle in 1974, Georgia Power anticipated annual growth in electricity sales in excess of 10%. Since that time, annual electricity sales growth by Georgia Power in its territory has declined steadily. In no year since the construction permit was originally issued has growth in electricity sales matched the average in which the Nuclear Regulatory Commission predicted the construction permit, let alone the average which Georgia Power forecast. In fact, never has the growth exceeded 8%; the average growth since Georgia Power applied for a construction permit in 1973 has been less than 2%; and the average annual growth in the last six years has been less than 1% (Georgia Power Company Financial and Statistical Review 1972-1983).

During the Atomic Energy Commission hearings on the construction permit application by Georgia Power (April 16, 1974 transcript), Georgia Power executive Bob Scherer told the Commission, "I believe there are still important economies of scale to be gained in the future, particularly in nuclear generation." Scherer added, "...the demand for electricity is relatively price inelastic." Of course, history has shown that the demand for electricity is highly elastic at the time varied. The demand for electricity is highly elastic and is directly related to a price increase of more than 20% from 1972 through 1980, and to saturation of certain markets (especially air conditioning).

Consequently, Scherer also erred in his forecasts of peak demand. He projected in 1970, peak demand to be 16,723 MW, while in fact it was 11,784 MW; he projected a 1981 peak of 19,327 MW and the actual peak was 11,614 MW; he projected a 1982 peak of 20,827 MW while the actual peak was 10,888 MW; he projected a 1983 peak of 22,327 MW while the actual peak was 12,127 MW. He also failed to take into account the reverse of any peak demand in the area of base load generation.

Georgia Power's failure to take into account the qualification process, clearly demonstrated that the Vogtle units would cause shorts in the system. Georgia Power's forecast of 10 percent annual growth in electricity sales (see above, p. 1-4-10). In 1985 needs, Georgia Power anticipated to build 1,100 MW of capacity as many fossil and hydroelectric units which are not needed to provide the failure to build these facilities, Georgia Power suffers an extraordinary overcapacity (see below).

The Atomic Energy Commission ignored those who said that the Vogtle units would not be needed and granted the construction permits in June, 1974. Within a matter of weeks, Georgia Power cancelled Units 3 and 4 of Plant Vogtle, and they have repeatedly postponed Units 1 and 2. Thus, the critics have been proven right--Plant Vogtle was never needed and never will be.

Georgia Power's load factor has steadily declined in the past decade, from 59.7% in 1973 to just 51.9% in 1983. This reflects a tremendous peak relative to base load, precisely the kind of demand curve that requires outbacks or baseload plant construction and increased use of ways to control the peak (such as radio load control).

Georgia Power is already greatly overbuilt. A 1978 Congressional report stated "Georgia Power Company rated first (in annual cost to consumers of excess generating capacity) with overcharges of \$39 million." (Nuclear Power Costs, US House Committee on Government Operations, 1978) Since that time, the overcapacity problem has become even worse in Georgia as several more coal and hydroelectric plants have begun operation while growth has not been commensurate with this new capacity. In fact, territorial kilowatt-hour sales have increased at a rate of less than 1% per year despite some of the most severe weather conditions ever recorded in Georgia.

In addition to Plant Vogtle, Georgia Power is constructing nine other generating units, including Plant Scherer Unit 3 (818 megawatts), Plant Scherer Unit 4 (818 megawatts), Bartlett's Ferry Units 5 and 6 (108 megawatts), Goat Rock Units 7 and 8 (27 megawatts) and Rocky Mountain Units 1, 2 and 3 (847.8 megawatts) (Georgia Power Company Annual Report 1983). Thus, the Company's overcapacity problem will be compounded if and when Plant Vogtle comes on line, particularly in view of the public's increased use of alternative energy sources including conservation.

Georgia Power itself has implicitly acknowledged that it does not need the capacity of Plant Vogtle, as it has repeatedly conceded to the Public Service Commission that it has tried without success to sell the capacity to out-of-state utilities.

Even if Plant Vogtle were completed, Plant Vogtle would not be the best way to meet the needs of Georgia's future. Georgia Power's Public Service Commission has stated that it may be more prudent economically to invest in alternatives (particularly conservation and solar energy) than to operate Plant Vogtle even if the plant is completed. Clearly, conservation and solar energy are less injurious to the physical and human environment than Plant Vogtle would be. A solar water heating system would save less in every household in Georgia at less cost than the cost of operating Plant Vogtle. Conservation programs will provide more energy than the plant could produce and have far less impact on the environment.

The Commission has also noted that the potential for solar energy in Georgia is greater than the output of Plant Vogtle would be, not even considering the likelihood that Plant Vogtle will be taken down much of the time (Georgia Power's Plant Vogtle, its only operating nuclear plant, has been taken down more than forty percent of the time).

The FSC has begun to question whether Plant Vogtle will be needed. In Georgia Power's most recent rate case, the Commission reversed its previous practice and disallowed Plant Vogtle's nuclear fuel from the rate base, stating in its final order dated January 17, 1984, "Of course, at the present time, Plant Vogtle is not operational and it is not expected that it will produce electricity for several more years, if at all...It is the Commission's position, as it has made clear from previous orders, that to be included in rate base an investment must be used and

useful to the retail ratepayer, if not immediately, at least in the reasonably near future. In the context of the nuclear fuel purchased for Plant Vogtle, since the plant itself is not yet in operation, it is obvious that the nuclear fuel purchased by the Company for use in that plant is not currently used or useful to the retail ratepayer, and cannot be for some time, if at all." (emphasis added) (Ga. PSC Docket No. 3397-U, Order on Reconsideration, January 17, 1984, pp. 3-4). It is important to note that in past cases, the PSC allowed the Vogtle fuel to be included in the rate base although the plant was further from operation than in 3397-U, demonstrating that a key concern to the PSC is whether the plant will ever be "useful" as well as whether it will ever be "used."

It is clear that Plant Vogtle is not needed either to meet increased energy needs or to replace older, less economical generating capacity. Increases in consumption have been far below the projections on which the construction was based, and new nuclear, coal and hydroelectric generating plants which have come on line since the construction permit for Plant Vogtle was issued already provide far more additional capacity than is needed.

Furthermore, it is clear that the running costs alone of Plant Vogtle would exceed the total costs of many environmentally preferable alternatives, including cogeneration using existing industrial process steam, conservation measures including increased insulation of homes, and certain applications of solar energy for home and street lighting. These alternatives would be of insignificant environmental impact relative to the operation of Plant Vogtle.

As conditions relating to economics, electric consumption patterns, and availability of alternative energy sources have changed since the construction permit was issued for Plant Vogtle, the NRC must at this time make a full assessment of the current and future needs of Georgia, as required by the National Environmental Policy Act of 1969.

The fact that Georgia has a surplus of electric generating capacity in the form of Soperen coal-fired units through 1992 (Georgia Public Service Commission Docket #3397-U), and that the electricity from the Soperen coal plants will be substantially cheaper than that from the Vogtle nuclear units, increases the likelihood that the PSC will conclude that Georgia Power acted imprudently in constructing the Vogtle nuclear units.

In addition, the PSC may look at the prudence of alternative investments, such as conservation and alternative energy. Expert testimony before the PSC in a



previous proceeding has stated that it may be more prudent economically to invest in alternatives (particularly conservation and solar energy) than to operate Plant Vogtle even if the plant is completed. This increases the likelihood that the PSC will exclude Plant Vogtle from the rate base.

As outlined above, in its final order dated January 17, 1984, the PSC ruled, "Of course, at the present time, Plant Vogtle is not operational and it is not expected that it will produce electricity for several more years, if at all... It is the Commission's position, as it has made clear from previous orders, that to be included in rate base an investment must be used and useful to the retail ratepayer, if not immediately, at least in the reasonably near future. In the context of the nuclear fuel purchased for Plant Vogtle, since the plant itself is not yet in operation, it is obvious that the nuclear fuel purchased by the Company for use in that plant is not currently used or useful to the retail ratepayer, and cannot be for some time, if at all. As a consequence, the Commission finds as a matter of fact that the nuclear fuel purchased by the Company for use in Plant Vogtle should be excluded from rate base." (emphasis added) (Ga. PSC Docket No. 2387-U, Order of Reconsideration, January 17, 1984, pp. 3-4) It is important to note that in past cases, the PSC allowed the Vogtle fuel to be included in rate base although the plant was not yet in operation, demonstrating that a key question to the PSC is whether the plant will even be "useful" as well as "used."

Georgia Power's attorneys believe that the PSC will exclude Plant Vogtle from the rate base if the plant is completed and being a power plant will not place it in the rate base.

The Georgia Public Service Commission has recently ruled that a complete review of Georgia Power's construction program will be required before any further financing will be allowed. This ruling preceded by less than three weeks an announcement that Georgia Power is planning to raise \$1.1 billion and build a \$1.1 billion plant. The PSC's ruling is expected to affect \$1.1 billion for construction.

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Another potential financial burden that the Company has failed to disclose is the impact of changes in federal tax law. Accounting is being considered by FASB's Accounting Standards Board and the U.S. Congress. These changes could reduce or reduce tax incentives for investment and construction, particularly in cases where

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conservation and other renewable energy has not been aggressively promoted. According to Georgia Power, its total accumulated deferred income taxes (net) at the end of 1983 totalled over \$100 million (Georgia Power Company Financial and Statistical Review 1973-1983); hundreds of millions of dollars more in investment tax credits might be "flowed through" to consumers by the regulators if the charges being considered are implemented. Similarly, recent tax reform proposals from Donald Regan would, if implemented, remove the investment tax credits and accelerated depreciation that Georgia Power now enjoys.

Georgia Power will be unable to safely operate the facility and will be unable to safely shut down and maintain the facility in the face of these self-inflicted financial difficulties. In order to stay afloat, Georgia Power will attempt to bypass safety considerations (as it has already done at Plant Hatch), operating the facility despite indications of safety problems, failing to file Reportable Occurrences and skimping on quality of workmanship and materials. The Company will be unable to safely shut down and decommission the reactor upon completion of its operating life (or in the event of a major accident) due to these financial considerations, and will be unable to safely dispose of spent nuclear fuel and other radioactive wastes due to the financial problems.

Furthermore, partners in the project will be unable to financially offset Georgia Power's inability to safely operate the plant. Indeed, it may be difficult for the partners to finance the costs of the facility. The financial burden faced by the other partners--Atlanta-Fulton County Corporation and its thirty-nine member electric membership cooperatives, Municipal Electric Authority of Georgia (and its forty-seven members) and the City of Dalton--far exceeds their entire assets. Recent efforts by the Reagan Administration to remove financial guarantees for electric cooperatives will, if successful, have a substantial impact on Atlanta-Fulton County Corporation and its members. The Department of Public Power and Public Utilities, which is the lead agency for the project, has not

adequately considered the financial impact of the proposed project on the other partners. The Department of Public Power and Public Utilities should conduct a thorough financial analysis of the project and its impact on the other partners before proceeding with the project.

The financial impact of the proposed project on the other partners also provides further evidence that alternatives would be environmentally preferable, since cogeneration, conservation, solar energy and coal do not present the potential for catastrophic failure of a major accident that nuclear power does.

The AES also fails to address adequately the potential danger from earthquakes at the site.

The U.S. Geological Survey has pointed out to NRC that "after several years of intensive study in the Charleston region, no geologic structure or feature can be identified unequivocally as the source of the 1862 Charleston earthquake." (letter from James F. Davine, Assistant Director for Engineering Geology, USGS, to Robert E. Jackson, Chief, Geosciences Branch, Division of Engineering, NRC, dated November 16, 1982)

The Charleston earthquake was the among the worst ever recorded in American history and was more intense than the San Francisco earthquake. USGS in 1867 said of the Charleston Earthquake, the "area within which motion was sufficient to attract...attention would be somewhat more than that circumscribed by a circle of a thousand miles radius. Six hundred miles from the origins, the long swaying motion was felt and was often sufficient to produce seasickness (nausea)." USGS reported that the earthquake was felt in the Adirondacks; Ontario, Canada; Michigan; Milwaukee and Green Bay, Wisconsin; and even Cuba. In eastern Kentucky and southeastern Ohio, "chimneys and bricks were shaken down." USGS went on to say, "In all of the large towns within two hundred miles of Charleston, more or less damage was suffered...doors were broken (on the Delaware River and near Barnwell)...At Augusta, 110 miles distant from the epicenter, the damage to buildings was considerable... (For example) at the Arsenal, the commanding officer's residence was so badly cracked and fractured as to necessitate practical reconstruction... In Atlanta, 200 miles distant, there was no serious injury, but falling things and some slight cracks in the walls... the houses were partially damaged by great shock and confusion by their occupants, and many people ran during the night in the streets to re-entering their dwellings."

The situation in Charleston itself was, of course, even worse. The words of an eye witness survivor are particularly eloquent in this respect:

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analyze the results of an earthquake of the magnitude of the Charleston Earthquake occurring at the plant site.

Another question inadequately considered in the DES is thermal shock. Thermal shock and the effects of operator response, neutron irradiation, and pressure vessel steel impurities remain an unresolved scientific question. Pressurized water reactors are susceptible to cracking of the reactor vessel due to severe drops in vessel temperature under high internal pressure. Neutron irradiation of the reactor vessel, especially at the midline, weakens the vessel and raises the reference temperature at a rate dependent on the impurities in the steel and welds and the rate of neutron irradiation. Studies by the Oak Ridge National Laboratories showed that conditions created during a routine transient at Rancho Seco reactor near Sacramento, CA might be enough to cause cracks in older irradiated pressure vessels. Further analysis and model simulations showed that whether pressure vessel ruptures would or would not occur in a Rancho Seco type transient depended on the operator response. If the model assumed correct operator response then the simulations indicated the pressure vessel would not rupture during the life of the reactor. Conversely, if the model assumed incorrect operator response, the reactor vessel would be subject to rupture within 3 or 4 years of start-up. Thus, protection from reactor vessel rupture seems to reside totally on operator response and not on redundant safety features built into the plant (Marshall 1981, 1982).

The reactor vessel for Plant 100's contains 0.11-0.12% copper and 0.012% boron. The DES does not discuss the effects of these levels of impurities on accelerated brittleness and should refer to literature for the pressure vessel. The DES also does not consider the effect of varied fuel rod geometrics on pressure vessel embrittlement. In general, the DES does not consider the long term safety hazards posed by the combination of thermal shock combined with the effects of vessel material impurities, embrittlement due to irradiation, and the confounding effect of operator error.

The Tulelake Aquifer is not a large volume of excellent quality water. This aquifer is a small region of aquifer for surface water at the site and provides drinking water for 18,000 people. In contrast, the Tulelake Aquifer provides five miles from one plant, and McDermott, only three miles away, the Tulelake provides drinking water for most of the community residents.

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the plant which penetrate and are open to both the Lisbon Sand Formation and the Tuscaloosa Aquifer can provide as much as two thousand gallons per minute of excellent quality groundwater. This groundwater is not only important as an existing source of drinking water but it is important to future development which is likely to occur along the Savannah River corridor.

Directly below the surface at the Vogtle Plant is the water table aquifer. While this aquifer is not as areally or vertically extensive as the Tuscaloosa or Lisbon Sand Formations, it is used extensively in Burke County as a source of drinking water for numerous domestic supply wells, as a small scale agricultural supply and for some commercial establishments. To these individuals, farmers and business people, loss of this source of water through contamination from Plant Vogtle could endanger health and cause economic hardship.

In the case of a release of radionuclides to the ground at Plant Vogtle, the water table aquifer would be the first and the most seriously impacted owing to its close proximity to the surface. In the area of Plant Vogtle, soils are permeable and virtually no runoff of rainwater occurs. Any release of radionuclide contaminated water would seep immediately into the ground and eventually reach the water table aquifer. The sandy nature of the soils and the aquifer material would offer little retention of radionuclides. The radionuclides would migrate with the groundwater and concentrate larger portions of the aquifer.

A significant contamination incident could result in contamination migrating vertically down and from the water table aquifer into the deeper Lisbon Sand Formation and the Tuscaloosa Aquifer. While a clay separating the water table from the deeper aquifers may provide some protection for the deeper aquifers, the 50 feet of hydraulic head on the water table aquifer acts as a vertical force on the clay separating it through fractures or more permeable sections of the clay. It is known that just south of the plant site, this clay changes into a limestone, nonfractured limestone aquifer, the Principal Intaker

The release of radionuclides from the water table aquifer into the deeper aquifers is a possibility. The release of radionuclides from the water table aquifer into the deeper aquifers is a possibility. The release of radionuclides from the water table aquifer into the deeper aquifers is a possibility.

The success of a quality assurance program is ultimately tied to the operation of adequate confidence concerning the correct functioning of critical facilities at Plant Vogtle.

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confidence in the capability of coolant and containment systems to perform their essential tasks.

Although potential deficiencies involving welds in containment liner penetrations had been raised as an issue at least as early as April 29, 1981 (I & E file #978303-X18), problems involving the appropriate inspection of welds have occurred at least as recently as September 1983.

Violation notification has been issued in several instances related to implementing the required test procedures. As indicated in IR 50-424/83-18 Appendix A, the applicant's construction sheet for examination of reactor coolant pressure boundary welds did not specify the penetrant examination test required by 10 CFR 50.55. Such a failure, not simply in the execution of a prescribed test, but the omission of the test from the required procedure, certainly reduces the confidence in the correct functioning of a vital reactor safety system.

Failure to assure that non-destructive testing is conducted consistent with applicable codes led to another violation as reported in IR-50-424 and 50-425. In this instance critical testing of the closure head weld cladding of Plant Vapour Unit 1 (15 X75810) was performed after hydro-dealloyment examination of the component. This represented not only a departure from the standard procedure of performing the examination on the component in its finished condition but an unintended method of degrading a critical steam generator component after its final installation and inspection. This failure was a basic failure in established quality assurance terminology.

Any adequate quality assurance program must take into account a broad range of "planned and systematic actions necessary" to establish confidence in the system in question. Any quality assurance program restricted exclusively to the implementation of detailed procedures without regard to the exercise of critical judgment and standards of professional practice must be considered inadequate.

The findings of the 'Code Experts' make your response to the question of whether you consider that, based on failure analysis and the results of the investigation, the required corrective actions have been taken.

The welding and site inspection of Unit 2 was conducted during a "very light mist, rain." The site supervisors felt that the conditions were suitable for welding since the surfaces of the pieces involved were not completely covered with moisture. The findings of the 'Code Experts' make your response to the question of whether you consider that, based on failure analysis and the results of the investigation, the required corrective actions have been taken.

The applicant's disposition to prefer restrictive implementation of prescribed procedures to the more circumspect methods of professional practice does not contribute to confidence in the proper functioning of a completed and operating Plant Vogtle.

In addition to these procedural aspects of quality assurance, there are other questions involving the applicant's "controlling the quality of the ... component or system to predetermined requirements." In the case of quality control the repeated discovery of inadequacies and defects in the performance of an essential safety subsystem would generate a cause for concern. Furthermore, at some point in time, good quality control practice mandates the abandonment of a suspect manufactured article in favor of a more reliable alternative.

The number of past and continuing failures of the Georgia Power/Bechtel QA/QC program represents a pattern which indicates an undue risk to the health and safety of the public. Violations involving activities at times resulted from failure to provide documented procedures. (For example, Report No. 50-424, 50-425/83-04 regarding concrete QC problems)

The severity of Quality Assurance performance at Plant Vogtle forced a meeting conducted 20 August 1975 at Georgia Power headquarters on the subject of Subcontractor Quality Assurance Performance Allegation by Pullman Power Products quality control personnel concerning pipe support installation and piping installation. The meeting was attended by quality control workers. Allegations included a welder's failure to use proper welding and work practice had occurred. Twenty-three concerns which dealt with twelve separate items were discussed. Defects were found during the reinspection of Pullman Power Products manufactured piping spool pieces. (Letter from James P. O'Reilly to Georgia Power, 28 September 1975. Subject: Summary of Meeting - Subject Nos. 50-424 and 50-425, Vogtle 1 and 2).

Concrete pipe support problems with Quality Assurance, outlined in filings

See also Table 3.11.5.1-1, Figures 3.11.5.1-1, 3.11.5.1-2, are intended to ensure effective operation under emergency conditions. For example, in investigating accelerated aging of materials, Sandia Laboratory has found that many materials exhibit a higher degree of degradation to be expected than the total amount of degradation expected from the normal service life of the material. This is particularly true for materials which are subjected to cyclic loading. See also, 10-11, "Accelerated Aging of Materials and Environmental Effects on Materials," which describes the problems which are

found in cable insulation and jackets, seals, rings and gaskets at VEGP. Current methods of testing have used high levels of radiation or only reported the integrated dose (VEGP FSAR, Table 3.11.B.1-1) and therefore underestimate the effects of the total dose. NUREG/CR-2157, "Occurance and Implications of Radiation Dose-Rate Effects for Material Aging Studies," June 18, 1981. The effects of synergisms, involving the combined effects of radiation, heat and in some experiments oxygen concentration, were also studied at Sandia. The greatest amount of degradation was found upon exposure to heat followed by exposure to radiation (significantly affected by oxygen during a LOCA simulation). NUREG/CR-2156, "Radiation-Thermal Degradation of PE and P.V.C.: Mechanism of Synergisms and Dose-Rate Effects," June 1981.

Sandia has also identified other interesting "anomalies." "Proceedings, International meeting on Light Water Reactor Severe Accident Evaluation (August 28-September 1, 1983) Cambridge." In tests of EPR cable material, multiconductor configuration performed "substantially worse" than single conductor configurations. Sandia concluded that qualification testing employing only single conductors as test specimens may not be representative of multiconductor performance. Testing of terminal blocks by prior industry standards (function before and after accidents) is not adequate. Instead, applicants must show equipment can function during accident conditions. Simulation of these conditions led to instrument reading errors on high resistance instruments of 10-100% which were not conservative. This study has led to a re-evaluation of test procedures and standards for qualification testing of a reactor as significant risks.

The results of these reports have not been applied to environmental qualification testing performed and referenced by Applicant to demonstrate compliance of safety-related equipment and components with applicable standards.

Several pieces of equipment specified in VEGP FSAR Table 3.11.B.1-1 as being

Also shown as qualified are forty-three (43) concrete minor operators



The NRC staff has only confirmed that they will pass IEEE 323-1971, a standard explicitly rejected by the Commission in CLI-80-21 as virtually useless.

A critical safety component in-LOCA is the post LOCA hydrogen recombiner. One common type of unit manufactured by Rockwell International has recently been shown to have a large number of defective parts. EECM No. 14 in IN 83-72 (10/28/83). For example, IIT pressure transducers failed typical IEEE 323 environmental qualification testing, i.e., they would not withstand radiation doses of  $1 \times 10^7$  rad and showed gradual drifting of readings after  $1 \times 10^4$  rads. Other hydrogen recombiners may suffer similar problems.

The applicant has not satisfied 10 CFR 80.48 which requires a showing that safety equipment is capable of surviving a fire in order to shut the plant down. Since the NRC has no testing program to establish that the necessary safety equipment is qualified to withstand the fire environment, there is no assurance that the applicant's equipment can withstand such conditions as high humidity, high temperature, spray, corrosive gas, smoke, all of these probably combined with radiation. Commission hearing of January 6, 1984, Tr. at 36; Without this assurance, Plant Vogtle should not be allowed to operate.

The DES fails to address adequately these concerns.

Applicant has not demonstrated that seismic seismic qualification of safety equipment is adequate for existing equipment for VGR. The design criteria and methods for seismic qualification of equipment in nuclear plants have undergone significant change. Consequently, the margin of safety provided in existing equipment to resist seismically induced loads may vary considerably and must be reassessed. NRC "Unresolved Safety Issues Summary," August 20, 1982. Again, the DES fails to address these concerns adequately.

In the Commission hearing of January 6, 1984, OSHA Administrator reported

...seismic qualification of equipment in all nuclear plants. The DES again fails to resolve these concerns.

Applicant's seismic qualification of equipment... effect the integrity of safety... NRC perceived this issue... following



The DES assessment of the potential impacts of chlorine emissions and salt emissions from the plant is inadequate.

The VEGP PSAR 5.5.1.1 estimates an approximate salt drift of 305 pounds per acre per year (see CPSER 5.3.2) within a one mile radius of the cooling towers, assuming a two-unit operation. Naturally this amount would decrease at greater distances. No mention was made of chlorine releases, although this point was brought up by NRC staff at the Construction Permit Hearing. Chlorine could be emitted from these towers, since chlorine is injected directly into the circulating water system, with a maximum system design chlorine rate of 10,000 lb/day. Thus there is the potential for the release of thousands of pounds per day of chlorine both in cooling tower emissions and in water emissions. This is not addressed in the FEI-CP or OLSER (see section 3.6.4.2) and could pose a serious environmental problem. In the VEGP-OLSER-Q-5290.3 the rate of salt drift emission of 305 lb/acre/year is admitted to be presently considered in the range of potential damage to vegetation.

Failure to address these concerns adequately is a serious shortcoming of the DES.

The Emergency Response Plan has not yet been developed by the Applicant. Unless and until an adequate plan is developed, the Environmental Statement cannot adequately address potential environmental impacts.

The DES fails to address adequately the unacceptable use of diesel generators manufactured by Transamerica Delaval, Inc. (TDI) for emergency backup power. In an emergency, adequate and fast power must be available to operate the emergency equipment. TDI's record is abysmal; there is an excellent chance that Plant Vogtle could be safely shut down if these generators are not replaced. Obviously, failure to consider this represents a major failure in assessing potential environmental impacts.

The applicant's responsibility for quality control is as follows: individual defect notification and corresponding remedial action. By failing to make a general assessment of the suitability of the TDI diesel generator system for such an extremely important emergency function, the applicant has failed to quality control its facilities into a condition of safety and reliability. The failure of the DES to address this is a major failure in its assessments.

The DES fails to address adequately the potential impacts of radioactive releases on the environment either during normal operating conditions or during emergencies.

Another major inadequacy of the DES is its failure to adequately consider the various problems related to the location of Plant Vogtle in such close proximity to the Savannah River Plant nuclear weapons facility. Cumulative impacts of radiation releases to the air, water and land and synergistic effects of accidents at one plant and their effects on operations at the other are just two examples of the potential negative consequences of such close operations. The DES fails to resolve these concerns. The proposed operation of the L-Reactor at SRP will only make the effects on the environment of Plant Vogtle's operation greater, yet the DES fails to resolve this concern.

The DES fails to address how NRC will determine the source of radioactive releases to the environment with two major nuclear facilities operating next to each other.

The DES fails to address adequately the impacts of transmission lines from Plant Vogtle on the environment. Running lines through Ebenezer Creek National Landmark when there is a more benign alternative route is unacceptable. Endangered species may be affected by the lines and since the plant is not sited, the alternative of not building it could remove any doubt about effects on the endangered species; the DES does not address this. The DES fails to adequately address the health danger from nonionizing radiation emitted by the transmission lines, despite the availability of much new evidence since the CP was issued.

The DES states that a single point to a single port instead of a multi-port discharge will decrease the area of discharge. It fails to address adequately the effects of a single point discharge from the plant with the area of discharge...

...do not meet the... standards... effect on the...

and a targeted species, including the hairy woodpecker (Picopus villosus), the persistent trillium (Trillium persistens), the green ash (Fraxinus pennsylvanica), the wood stork (Mycteria americana), the red-cockaded woodpecker (Picopodus borealis), the bald eagle (Haliaeetus leucocephalus), the black-bellied whistling warbler (Pipilo maculatus), the yellow throated vireo (Vireo flavifrons), the scarlet tanager (Tangara erythrogastra), the Carolina parakeet (Carpodacus carolinensis) and the sandhill crane (Grus americana). The potential impacts of these species of the effects of plant...

accident conditions could seriously threaten one or more of these species by radiation, chlorine, transmission lines, construction, heat or other means.

The DES fails to consider the potential danger posed by additional fogging or other weather impacts of the cooling towers, particularly in view of the heavy fogging which occurs in this area.

The DES fails to consider adequately the socioeconomic impacts of plant operations on the community and on the state.

The DES fails to address adequately the impacts of the fuel cycle on the environment.

The DES claims that decommissioning will have minimal impact on the environment, yet no plan yet exists for decommissioning the reactor.

The DES fails to consider the potential impact on the plant of dam failure of any of the dams on the river from the plant.

The DES fails to address adequately the impact on historical and cultural resources. For example, no mention is made of the Francis Plantation, which is listed on the National Register of Historic Places. It has been proposed that a pipeline be constructed through the plantation and that a building at the plantation be used to house the transmission line.

The DES also states that alternative to plant cogeneration will be more expensive but offers no justification for this assumption beyond a generic rulemaking to that effect. Apparently, no effort was made to assess whether this holds true for cogeneration, even under the DOE's assumptions, and consequently whether an evaluation should be made in this case; clearly it should.

---

Tom Johnson  
Executive Director  
Environmental Defense Fund  
11 Dupont Circle, N.W.  
Washington, D.C. 20036  
202-638-1000



# Educational Campaign for a Prosperous Georgia

175 Trinity Ave. S.W., Atlanta, Georgia 30303 404-659-5675

January 7, 1985

Director  
Division of Licensing  
United States Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Sir:

On January 4, the Educational Campaign for a Prosperous Georgia and the Campaign for a Prosperous Georgia jointly filed comments concerning the Draft Environmental Statement related to the operation of Vogtle Electric Generating Plant, Units 1 and 2, Docket Nos. 50-424 and 50-425 (NUREG-1087) (hereinafter "DES"). This letter supplements those comments.

Today, January 7, 1985, William Lawless is filing comments concerning the DES. We are working closely with Professor Lawless in the licensing proceeding for this docket and we hereby incorporate his comments into ours by reference.

Also, by letter dated January 3, 1985, Judith E. Gordon, Conservation Chair of the Savannah River Group of the Sierra Club, filed comments on the DES. We hereby incorporate Dr. Gordon's comments into ours by reference.

If you have any questions or comments, please contact me at the above number.

Sincerely,

Tim Johnson  
Executive Director  
Campaign for a Prosperous Georgia and  
Educational Campaign for a Prosperous Georgia

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET  
ATLANTA, GEORGIA 30365

50-424, 425

JAN 10 1985

4PM-EA/HOM

Ms. Melanie Miller  
Division of Licensing  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

SUBJECT: Draft Environmental Impact Statement  
Related to the Operation of Vogtle Electric  
Generating Plant, Units 1 & 2  
EPA Log No.: D-NRC-E0004-GA

Dear Ms. Miller:

Pursuant to Section 309 of the Clean Air Act and Section 102(2)(C) of NEPA, EPA has reviewed the Draft Environmental Impact Statement (DEIS) on the operation of the Vogtle Electric Generating Plant, Units 1 and 2. Our review of this project has primarily concentrated on air quality, water quality, wetland impacts, and noise. We encourage you to also coordinate with other agencies for their review of other environmental and non-environmental factors.

Based on the discussion in the attached "Detailed Comments," we rate this DEIS an "LO-2", i.e., lack of major objections to the proposed action. However, some additional information and clarification has been requested in the attachment for water quality as well as supplemental mitigation measures suggested for potential wetland and noise impacts.

We appreciate the opportunity of commenting on this DEIS. Please contact us if you have any questions regarding our comments. The contact person on my staff for this project is Chris Hoberg at FTS 257-7901.

Sincerely yours,

Sheppard N. Moore, Chief  
NEPA Review Staff  
Environmental Assessment Branch

Attachment: "Detailed Comments"

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cc: Mr. W. Thomas Brown  
Associate Regional Director  
Planning and External Affairs  
U.S. Department of the Interior  
National Park Service  
Southeast Regional Office  
75 Spring Street, S.W.  
Atlanta, Georgia 30303

Mr. Edwin M. Eudaly  
Acting Field Supervisor  
U.S. Department of the Interior  
Fish and Wildlife Service  
Federal Building  
810 Gloucester Street  
Brunswick, Georgia 31520



## DETAILED COMMENTS

### AIR QUALITY

We have reviewed the DEIS for non-nuclear ambient air quality impacts. Since this is a nuclear plant, the only non-radioactive pollutants (e.g., sulfur dioxide and nitrogen oxides) are those produced by the operation of the emergency diesel generators and auxiliary boilers. The emissions from these sources are sufficiently low and the diesel generators are exempt from the State of Georgia air quality permitting requirements. The auxiliary boilers are proposed to be operated in accordance with Georgia permit emission limitations. Visible emissions from the cooling towers should not degrade visibility of any Class I area with the plume dissipating near the plant.

We, therefore, find no ambient air quality concerns for any non-nuclear pollutants if the plant is operated as proposed.

### WETLANDS

Our major wetland concern involves the proposed routing of a high voltage transmission line through Ebenezer Creek Swamp, an area designated by the U.S. Park Service as a National Natural Landmark. The original alternative to clear-cut a 150-foot wide corridor through the swamp would have had a significant adverse environmental impact on the ecosystem. However, the modified plan, developed by the applicant in response to the concerns of the U.S. Fish and Wildlife Service and the National Park Service, should minimize the impact on the swamp. By the use of taller towers, the clearing can be limited to a 100 by 100 foot area for the base of the tower at Station 124.00.

Best Management Practices should be used to minimize construction impacts on the water quality of wetlands adjacent to the work site. Access roads for construction should avoid filling wetland areas. Any permanent sloughs and water channels should be crossed by bridging or open-bottom box culverts adequately sized to accommodate the natural flow. To minimize additional clearing, existing logging roads should be used whenever possible for access roads.

In addition, for areas in or adjacent to the swamp, we would prefer mechanical means used for any necessary right-of-way maintenance. Any herbicides used, of course, should be EPA approved and applied in accordance with label directions.

### WATER QUALITY

Our water quality review has identified the need for some additional clarification and information. Our detailed water quality concerns are as follows:

- o Outfall Serial No. 001B7 of the NPDES permit limits the non-radiological components of the radwaste discharge and should be discussed in Section 4.2.5, page 4-5 or Section 4.2.6, page 4-6.

- o Page 4-6 and 4-7, Section 4.2.6. Under 40 CFR Part 423, "chemical metal cleaning wastes" are not included in the "low volume waste" category. To the extent that "start up and equipment cleaning" wastes are conducted using chemicals such as acids, alkaline phosphate solutions, etc., they are properly designated "chemical metal cleaning wastes" and not "low volume wastes." If wastes result from water wash only, they would properly be designated low volume wastes and could be combined with other low volume wastes for co-treatment in one of the designated facilities. However, "chemical metal cleaning wastes" are designated for treatment in the start-up pond prior to combination with treated "low volume wastes." Metal cleaning wastes are limited in terms of total iron, total copper, and oil and grease as well as total suspended solids (See Part III.B.3, page 14 of the NPDES permit). (Note: Effluent guidelines limitations are properly presented in Table 5.1.)
- o Section 5.3.2.3., page 5-7 and 5-8. Discussions should include assessments of the impact of continuous chlorination for Asiatic clam control on concentrations of chlorine released as well as time of detectable discharge of total residual chlorine (TRC). This discussion should address one unit operation where dilution from the second unit is not available and assume a limit of detection of 0.03 mg/l.

#### NOISE

The DEIS considered both on-site generated noise and off-site transmission line noise impacts. On-site noise generators, based on model predictions, are expected to increase noise levels at receptor sites located at the perimeter of the facility from 1 to 12 dBA over ambient levels. None of the sites, however, are predicted to experience noise levels exceeding 40 dBA. Using the composite noise rating versus community response scale (DEIS, Figure 5.23), Sites No. 5 and 6 would be expected to generate considerable community complaints based on noise level increases of 11 and 12 dBA, respectively. However, since no residential receptors are currently located near these sites, no noise impacts are expected.

One off-site residential receptor along the transmission line corridor is expected to experience noise level increases of 12 to 20 dBA over ambient levels. These noise level increases are expected to be generated by the transmission line during and for several hours after wet weather conditions. Because of its hearing-frequency range and tonal nature, the expected 49 dBA L<sub>10</sub> level at the home site can be considered to be equivalent to a 58 dBA level in terms of intrusion and annoyance. The magnitude of the noise level increase and its intrusive nature may result in considerable annoyance, and we would consider it to be a significant impact. Therefore, feasible mitigation measures for this residential site should be considered by the applicant and the U.S. Nuclear Regulatory Commission.



DIVISION OF NATURAL SCIENCES  
AND MATHEMATICS

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# paine college

1236 FIFTEENTH STREET (10)  
AUGUSTA, GEORGIA 30910  
404-722-4471

January 11, 1985

Ms. Eleanor Adensam  
Division of Licensing  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Dear Ms. Adensam:

Formal comments to replace earlier handwritten comments submitted January 7, 1985 are attached. I appreciate the extension of time given to me by Mr. D. S. Hood during our telephone conversation January 7, 1985. Considering that the holiday season occurred in the middle of the scheduled DES review period, the complexities of an environmental assessment for an electric generating plant, nuclear or fossil-fueled, the almost impenetrable barriers created by jargon, pseudotechnical, and technical language, my review could not have been as complete as it is without an extension.

I feel my own review is insufficient. The subject is too complex, too broad, to be studied in the allotted time. The Vogtle DES should receive a full peer review, and not published until such a review has been completed.

Thank you for your attention to these comments and for being allowed to comment.

Sincerely,

William F. Lawless  
Assistant Professor of Mathematics

WFL/ssn

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Plant Vogtle Draft Environmental

Statement-Comments

W.F. Lawless

Assistant Professor of Mathematics

Paine College

January 7, 1985

# Vogtle Electric Generating Plant

## Draft Environmental Statement (NUREG - 1087)

### General and Specific Comments

#### General Comments

1. The DES does not describe in detail the VEGP radiological and hazardous contaminant airborne and liquid effluent monitoring network. It is commonly accepted that monitoring devices may generate data that is of little value due to either poor location, installation, poor development of the monitoring device and its instrumentation, the process of sampling or poor sample analysis. The DES inadequately treats many aspects of this problem, e.g., no rationale on the groundwater well monitoring locations has been provided in the DES: well monitor locations can preclude the generation of meaningful data or can predetermine a data skew. The absence of an indication that contaminants are migrating in the aquifers underlying Vogtle may not mean that the aquifers are free of contamination.

Uniform reporting methods of environmental conditions have not been adopted in this DES. All VEGP sources of water, groundwater, water transportation systems, and waste water systems must be reported in a manner that makes the data accessible so that a determination can be made that a water source has been contaminated. The Savannah River Plant (SRP) manner of reporting contaminated mercury migrating at SRP will provide an example of the difficulty of interpreting groundwater data. The SRP radioactive waste burial ground has approximately

10,000 lbs of mercury buried in the soil. The migrating levels of mercury in the groundwater under the SRP burial ground have in the past usually been just below the EPA drinking water standards (DWS) and the Savannah River Plant has reported these levels against the DWS: "A detailed mercury analysis of waste from 89 burial ground and perimeter wells, following EPA procedures, was completed and showed no mercury concentrations presently above drinking water limits." (1, emphasis added) At the same time, in the adjacent Savannah River Plant F- and H-Area radioactive seepage basins, mercury is also migrating in the groundwater from the basins, but at highly elevated levels up to a maximum reported level of 25 times over the EPA drinking water standard. (2) The SRP makes only passing mention of this data but does not compare it to drinking water standards (DWS) as before; however, the EPA has commented that the SRP groundwater contaminant loadings "...demonstrate a method of discharging pollutants to a stream without a permit by using the groundwater as the medium of transport." (2,3) The Savannah River Plant does admit that "The ground-water down gradient from these seepage basins shows mercury concentrations 100 times higher than background levels." (2)

2. The Vogtle DES contains many erudite technical conclusions resulting from the use of numerous, but what appear to be, unvalidated technical models. 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 controverted. National groundwater contamination statistics are not only relevant to the DES, the DES cannot be adequately assessed without those data.

3. The Vogtle VEGP consultant and technical staff that has generated or collected most of the technical data, if paid, would be expected to be more strongly influenced than the well known Rosenthal experimenter expectancy effect might predict, (4) because the VEGP consultants would have been compensated financially for their technical contributions; but the NRC technical staff that has written the DES may be subtly affected by the experimenter expectancy effect also. The Rosenthal experimenter expectancy effect is a well documented research bias displayed unwittingly by an experimenter that can skew or lead technical statements to a certain conclusion. As F.W. Bessel, a German astronomer, first proved in 1815, individual differences even amongst the most experienced astronomers can lead to observational differences. The Rosenthal experimenter expectancy effect describes an individual difference that skews an experiment or the collection of data along lines of a researcher's bias or prejudgment. How much independent data gathering has the NRC staff done and will do at VEGP? Has an independent assessment of the NRC staff's analysis of VEGP been completed? Will the NRC staff's technical assessments of the VEGP be independently peer reviewed? What is the total cost to the NRC to which produce the DES? What portion of the total cost was paid to which subcontractors and/or consultants?

An example may help define a part of this problem. The Savannah River Plant annually publishes public and internal environmental data collected on and off the SRP plant site, neither subject to peer review. The 1978 annual monitoring public document, DPSPU-79-302, was publically criticized in January 1984 for underreporting the maximum levels of alpha radioactivity migrating through ground-water monitoring wells by 67 times, underreporting the maximum non-volatile beta level by 155 times, and underreporting the maximum tritium level by 58 times. (3,5,6,7) Further, the average reported tritium levels in burial ground monitoring wells in 1978 averaged 563 pCi/ml in public reports and 90,000 pCi/ml in internal Savannah River Plant reports, an underreported difference of 160 times. (3,5,6,7) Since the underreporting was criticized, a new annual report on year 1981 has been released; (8) the new report shows an increase in overall radionuclide migration since the 1978 internal and public data was published: the 1978 private and 1981 public data for maximum levels of alpha in groundwater are about the same (from 161 to 157 pCi/L), the maximum level for non-volatile beta increased more than three-fold (3100 pCi/L to 10,633 pCi/L), and the maximum level for tritium increased twice (2,002,000 pCi/ml to 4,330,230 pCi/ml). (5,6,7,8) A researcher or organizational bias can influence the data and conclusions reported.

4. The time period for the technical review of this Vogtle draft environmental statement (DES) has been inadequate. It presupposes that technical assumptions and methodology and conclusions associated with this DES are either obviously correct



or flawed, and that appropriate technical assessment(s) of the DES can be responsibly made within a legally monitored and timed framework. Science, and the technical, possibly also the non-technical, and environmental questions raised by the Vogtle nuclear electric generating plant, cannot be slaved to business or bureaucracy without risk to all involved; the more important the environmental questions, the greater the risk. The DES should be submitted to an independent peer review, and not published until that peer review is completed, whatever the process.

5. The DES states there is no need to consider the purpose and need for power issues, specifically, the merit of whether or not the VEGP should be provided a license to operate based on the demand for power. Although not discussed, this decision by the NRC assumed that nuclear power plants are lower in total costs (preconstruction, construction, licensing, operations, post operations, and decommissioning) than conventional plants or other alternatives. The NRC attests only that "substantial information exists that support an argument that nuclear plants are lower in operating costs than conventional fossil plants." (p.21, emphasis added). Whereas this statement may be true, it may also be misleading. It may also reflect a predetermination to license VEGP regardless of the environmental obstacles confronted by VEGP.

The environmental statement cannot be adequately assessed without a careful study of the total technical and environmental basis

for the VEGP, including the engineering assessment of the economics and the demand for power, both a vital part of the technical basis. It is only after all the facts are available and woven into a coherent whole that a decision should be made that a nuclear facility is more economical than other generating capacity, a conclusion the DES has prematurely reached. The NRC decision not to consider and publish in the DES the purpose and need for power issues may mean that the NRC is unable to prove the need for power or for the Plant Vogtle Electric Generating Plant. If the need exists, it should be published in the DES.

6. What financial assurances exist that VEGP will be able to fund not only the post operational environmental radiological 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 presently surrounding VEGP indicates a preponderance of groundwater table wells (FSAR), what technical and financial steps will VEGP take to return the 3,169 acre VEGP site back to the public domain free of radionuclide and hazardous waste contamination in the water table aquifer? The groundwater contaminant washout period under the SRP radioactive burial ground has been predicted to be at least 100 years for tritium, i.e., it would take 100 years after SRP operations cease before the groundwater under the burial ground would be safe to drink considering only the current levels of tritium contamination in the groundwater. (3)

7. The issue of whether or not the marl underlying VEGP is an aquiclude and a barrier to the downward migration of contaminants into the Tuscaloosa aquifer is discussed under Specific Comments 9 and 21.

8. Cooling tower impacts are discussed under Specific Comment 12.

9. Radiological impacts are discussed under Specific Comment 13.

### Specific Comments

1. Figure 4.2 does not clearly locate surface ponds.
2. Figure 4.10 does not clearly denote distance.
3. Figure 4.11 graphic scale is not clear nor can either the topographic elevations or the legend be read.
4. Figure 4.12 is not easily oriented to VEGP and has no discernible scale.
5. Table 4.5 does not include EPA drinking water standard (DWS) statistics for each characteristic. Some of the releases may exceed the DWS and should be questioned, e.g., iron, mercury, lead and chromium all appear to exceed the EPA DWS at the point of discharge, but this information is not accessible on page 4-42 (partially resolved on page 5-104). Table 4.5 should also include the average high-low Savannah River concentrations of the released effluent characteristics (partially resolved by Table 4.8) and the effluent characteristics should be bounded by ranges (high-low release concentrations). Each liquid effluent characteristic chemical should be identified by source (Table 4.2) and totaled in Table 4.5 in order to account for all biocide/chemical use at Vogtle; waste radionuclides should be included. In Table 4.5, for effluents exceeding DWS standards, release permits should be identified (e.g., chromium and iron are identified in the NPDES permit, Appendix E). Calcium, sodium and phosphorous releases appear to substantially exceed the average Savannah River water quality characteristics; this should be identified. The impact of these releases, those that exceed DWS standards and those that exceed average Savannah River water

quality data, on the Savannah River biota should be discussed. Copper is misspelled. Table 4.5's title should include the word "predicted." The effluent release point is not identified.

Production water well and observation well information is inaccessible and appears discordant. The DES appears to indicate that there are only two makeup water wells, and no others, but the FSAR and VEGP responses to questions indicate that there are up to 8 production wells. The number of observation wells seems even more elusive, anywhere from 36 to 47 wells, possibly not counting piezometers (piezometers should be located). The well locations are poorly defined, the observation network not explained.

The available water quality in the water well data should be measured against Table 4.5, characteristic for characteristic. Otherwise, migrating contaminants would not have a datum to be measured against. This should be duplicated for surface and spring waters.

6. There is no comparable table to Table 4.5 in the DES to account for surface releases (into sediment and surface ponds, sumps, retention basin, holdup tanks or other possible surface groundwater entry points) and their predicted water quality impacts.

7. Page 1-1, Section 1.1, first paragraph. A detailed statement should explain why the applicant cancelled VEGP Units 3 and 4.

8. Figure 4.3 The VEGP monitoring well network should be descriptively associated with Figure 4.3, especially the retention basin, startup pond, blowdown sump, and the discharge waste water drainage lines at key points. The average combined effluent discharge in Figure 4.3 of 10,285 gpm should be the same 10,280 gpm statistic used in Table 4.5. The startup pond mass-rate balance indicates the potential for contamination of groundwaters beneath the startup pond. The average groundwater consumption (p. 4-3) of 1333 gpm is not found in Figure 4.3 which shows an average well draw of 840 gpm (also p. 4-13). The waste water retention basin inflow of 290 gpm exceeds the outflow of 280 gpm. The radioactive waste treatment system discharge of 5 gpm appears not to be included in Table 4.5 effluents into the Savannah River and may explain the above noted 10,280 versus 10,285 gpm discharge statistics. Inflow into the blowdown sump of 10,420 gpm does not equal the listed outflow of 10,280 gpm. Inflow into VEGP of 300 gpm is not balanced by the accounted 295 gpm outflow. The Figure 4.3 system with monitoring wells should be included on a clearly understood surface location map similar in layout to Figures 4.2 and 4.11.

9. Section 4.3.1.2 Groundwater, P. 4-12. The DES states that the hydraulic head for the deep aquifers is higher than the river and causes communication from the deep aquifers to the river. The DES further states that this head differential allows only upward water transmission which prevents the potential downward migration of contaminants into the underlying aquifers. Both statements are unsubstantiated and predictive. The nearby

Savannah River Plant has made similar predictive statements in the past that have recently been contradicted by data published in the L-Reactor EIS (1984). (2) A higher hydraulic head does not mean nor preclude communication between an aquifer and an overlying surface stream. Transmission pathways established by pressure differentials do not of themselves preclude concentration and gravitational gradient induced contaminant transmissions against the pressure differentials; e.g., transmission rates must be concurrently analyzed.

The DES assumes that the surface marl is an effective containment against downward contaminant migration from released effluents. The DES describes the marl as 60-70 feet thick. The DES assumes the marl is continuous without fracture, without penetration, over 3,169 acres. The DES states that the average groundwater consumption of 1333 gpm (p. 4-3) is drawn from the Tertiary Groundwater System hydraulically connected to the Cretaceous (Tuscaloosa) System. These statements are all predictive and mostly unvalidated. The Savannah River Plant has made similar predictive statements in the past recently controverted by their L-Reactor EIS. (2) The SRP facility has found contamination in its Tuscaloosa wells and gross levels of contamination above the Tuscaloosa aquifer in the ground water table aquifer underlying a surface seepage basin (M-Area basin). (2) In the L-Reactor EIS, the SRP explained the contamination in one Tuscaloosa production water well (well 53-A) by postulating that the pathway was the well itself (via a deteriorating casing), but did not explain the contamination in a second Tuscaloosa production water well (well 20-A); (2) after

the May 1984 L-Reactor EIS publication, contamination of a third Tuscaloosa production water well (well 31-A) was discovered in August 1984. (6) The L-Reactor EIS also does not include contamination found in three adjacent Tuscaloosa monitoring wells published in a draft DuPont report (ca. March 1984). (9) The L-Reactor EIS does state that the Tuscaloosa is no longer considered isolated by what was once thought to be impenetrable overlying clay barriers and that there is in theory, no reason why overlying, contaminated groundwater aquifers could not contaminate the underlying Tuscaloosa aquifer. (2) For example, in a discussion of the impact of water withdrawal rates from the Tuscaloosa on the groundwater above the Tuscaloosa aquifer and contaminants the groundwater may hold, the Savannah River Plant stated, "...increased pumping to support [the] L-Reactor...could increase the tendency for contaminants already present in the groundwater to move downward." (2, p. 5-17)

The DES makes its assumptions on a limited, poorly defined well drilling and monitoring program. Models and subsequent predictions based on those assumptions are then made. The logic becomes irrefutable, based on those assumptions. The Savannah River Plant made similar predictions since proven fallacious. The DES assumptions cannot be disproven until surface released contaminants from VEGP also enter the drinking water and are subsequently discovered. (2,6,10)

Without a detailed presentment of groundwater flow paths, the DES expands on the impervious marl assumption by predicting that all downward migrating contaminants will outcrop in stream



channels bounding Vogtle. The DES logically concludes "...that the water table aquifer is hydraulically isolated on an interfluvial high..." This conclusion is inescapable, based on the assumptions leading to the conclusion. The DES plots predicted contaminant flow paths and a "...probable discharge point of potential contaminants percolating into the water table aquifer beneath the plant site." (p. 4-12) At the Savannah River Plant, the (M-Area) Tuscaloosa aquifer contamination occurred approximately underneath the percolating contaminants and underneath the liquid waste storage tank. (9)

10. Section 5.3.2 Water Quality. The effluent released to the Savannah River will exceed the pH criteria of 8.5 established for a "fishing" classification (p. 5-6). See Table 4.5 Explain.

11. Section 5.3.2.4 Radiological Effects The DES assumes that the marl underlying VEGP is impermeable and will trap radioactive effluents migrating from the auxiliary building basement from a ruptured recycle holdup tank. The highest levels of M-Area migrating contaminants measured at the Savannah River Plant were directly underneath a solvent storage tank that had not ruptured but had been in service about 25 years. (9) The marl-clay barriers underneath this SRP solvent tank were similarly considered impermeable, but contamination has been found in drinking water production wells drawing water from the deep Tuscaloosa aquifer. (2,6,10)

12. Section 5.5.1.1 Cooling Tower Operation The DES states that VEGP cooling tower effluent concentrations are equivalent to the circulating water characteristics. Item 5 above noted that the VEGP combined effluent release characteristics appear to exceed DWS standards for at least four characteristics including iron, mercury, lead, and chromium; the circulating water characteristics are at least equivalent to the combined effluent released to the Savannah River, but in addition, some are higher, e.g., TDS and TSS, although blowdown reconcentration is a factor (p. 5-106). At the Savannah River Plant, tritium release stacks are downwind (the prevailing wind) 2 km to the SRP radioactive waste burial ground, yet the background groundwater tritium concentration under the SRP burial ground is approximately the averaged airborne tritium concentration released from the SRP tritium stacks.(10) SRP airborne tritium releases have taken place over a thirty year period and can be assumed to approximate a steady state airborne release source to the groundwater underlying the SRP burial ground; the SRP burial ground groundwater can be assumed to approximate a steady state sink. (10)

Vogtle cooling tower airborne release concentrations are considered to be equivalent to circulating water concentrations that may exceed EPA drinking water standards (DWS). Considering the SRP tritium airborne releases and consequent groundwater concentrations of tritium, steady state cooling tower effluent depositions may similarly exceed acceptable DWS standards within a large radius of the release points. The DES verifies its

conclusions regarding the acceptability of the releases based on literature searches and modeling studies; the Savannah River Plant literature and SRP models referenced by the DES have reached similar conclusions in the past, conclusions since proven false; (2,6,10) e.g., a tritium groundwater radionuclide predicted travel time of 200 years to migrate from the SRP burial ground to the first outcrop can be compared to the actual 25 years it took the tritium to migrate. (3,6) Modeling studies unvalidated by operational field tests equivalent to the VEGP operating conditions should be rejected. VEGP long-term well-monitoring should network the plant to validate and to correct DES predictions. The VEGP well-monitoring network should be independently peer reviewed.

13. Section 5.9 Radiological Impacts Radiological releases and doses from VEGP are estimated based on models. Savannah River Plant releases and doses are mostly estimated with estimates improved by feedback from the SRP radiological monitoring network. The DES does not consider cumulative radiological effects from VEGP and SRP. No validation of the radiological release models are identified. Error bars are used to reflect DES uncertainty ranges, but the uncertainty may be due to mathematical uncertainties uncorrelated to actual conditions. For example, the Savannah River Plant predicts SRP airborne radiological releases will increase with the L-Reactor on line in 1985 and further predicts that the maximum tritium concentration in milk at the 17 km SRP plant boundary will then be  $3.9 \text{ E}3 \text{ pCi/L}$  ( $3.9 \text{ E}3$  is read as 3,900); maximum I-131 in milk at the SRP 17 km

plant boundary to be  $1.1E-2$  pCi/L; and maximum Sr-90 in river water below the SRP plant to be  $6.7E-2$  pCi/L. (2, p. 5-52) The actual 1982 maximums were: tritium at 5400 pCi/L (northwest 35 km from SRP plant center: 24 milk samples at Langley, SC; mean 1400 pCi/L; 2 std. dev. at  $\pm 2600$  pCi/L), I-131 at 5.2 pCi/L (south about 25 km from SRP center; milk samples from Girard, GA; mean 4.7 pCi/L; 2 std. dev.  $\pm 5.6$  pCi/L) and Sr-90 in river water at 0.73 pCi/L (offplant at station R-10 Highway 301) and Sr-90 in milk at 14 pCi/L (southwest 45 km from SRP plant center; 3 milk samples at Waynesboro, GA; mean at 7.5 pCi/L; no calculated std. dev.). (11) In this example, SRP slightly underestimated the maximum tritium release, underestimated the maximum I-131 release by two orders of magnitude, and underestimated the maximum Sr-90 release for river water adjacent to the plant by one order of magnitude. Of more importance, these underestimations by SRP were predicted at a 17 km distance under increased release conditions whereas actual readings for tritium were 18 km further out and for I-131 were 8 km further out against the predominant wind vector. The Sr-90 river water prediction and sample location were the same, however, the Sr-90 milk reading was 28 km further out from the SRP plant boundary against the predominant wind vector but parallel to the second maximum prevailing wind direction. Considering wind and distance distribution effects, that the predictions are based on a higher radioactive effluent release rate than that currently released, the already underestimated SRP predictions could be magnified by one to three more orders of magnitude. A different analysis of the predicted DuPont releases using SRP tritium burial ground

background concentrations, PAR pond tritium concentrations (a large pond at the SRP facility), SRP boundary air moisture concentrations, and a single data point for kr-85 concentrations at 300 km concluded that SRP releases for tritium and krypton-85 may be low by as many as five orders of magnitude. (10)

The DES should reflect these actual circumstances. The DES should discuss cumulative effects. This same SRP literature is referenced in the DES. The existing radiological burdens from the Savannah River Plant should be reflected in the DES since VEGP releases will add to those burdens, both for radiological and non-radiological releases. The DES relies on the open literature and models but does not discuss validation. Actual circumstances at the SRP belie the SRP literature and SRP models and may do the same for the DES. (6,10) In the instance of Sr-90 in milk 45 km from the SRP release point, the Sr-90 level exceeds the 8pCi/L EPA drinking water standard for Sr-90. (6,11) The SRP dose calculations are predicted and are based on the much lower, calculated releases ignoring SRP's own published data. (2,6)

The DES has not published accessible air quality concentrations at the stack points and distances from plant center. The DES does rely on XOQDOQ type calculations (p. 5-35) for accident analyses. These are similar to SRP calculations found to be largely underestimated above. (2,6,10) XOQDOQ is a gaussian distribution plume model for stack released contaminants and

accounts for meteorological conditions and distances from the release point. (10) The DES notes that the "...cause-and-effect relationship between radiation exposure and adverse health effects are quite complex...[but] they have been studied extensively." (p. 5-36) XOQDOQ is representative of the mathematical complexities involved, but XOQDOQ makes many assumptions not readily discernible to the uninformed and not easily validated. (10) Einstein noted that "as far as the laws of mathematics refer to reality, they are not certain; and as far as they are certain, they do not refer to reality." (12) XOQDOQ is not reality, nor are the physicochemical models used to predict reality, but the tritium concentrations in the milk at Langley, SC, the I-131 concentrations in milk at Girard, GA, the Sr-90 river water concentrations beneath the SRP, and the Sr-90 concentrations in milk at Waynesboro, GA, are samples of reality, samples collected by the SRP plant's prime contractor DuPont, samples significantly underestimated by the SRP physicochemical predictive models, models of similar process and of equivalence to the DES models.

14. Locate water table aquifer divides on a clear VEGP surface map.

15. The DES should list and discuss the possible sources of surface chemical and radiological contamination to the groundwater underlying VEGP, e.g., the concrete basins, sediment ponds, startup pond, etc.

16. The topographic map of VEGP appears to indicate that VEGP is not necessarily on an interfluvial high bounded on all sides by stream channels but that channels appear to cut into the site at various angles and appear to only partly bound the site. Explain.

17. Tuscaloosa piezometric contours should be provided and the predicted flow path in the Tuscaloosa provided. Scale should allow a comparison of the Savannah River Plant data also. A comparison with the SRP data would provide timely assistance.

18. The DES should include a summary description of each well construction type (e.g., make-up well, test well, confined aquifer observation well, unconfined aquifer observation well, etc.). Observation well/surface water monitoring techniques should be discussed (by well and surface water type if different), e.g., sample collection, nuclides analyzed, sampling periods, assay organizations, and standards.

19. Closed and/or abandoned wells should be precisely located on a surface map and well closure sealing techniques should be discussed.

20. 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 relate to all VEGP construction. As at the SRP, these

wells may be the weak link in the underlying, protective marl, a pathway for contaminants to enter the confined aquifer (cf. L-Reactor EIS, discussion on well 53-A, p. F-99). (2) Discuss.

21. The FSAR appears to indicate piezometric and well water level differences in all wells. Discuss the marl mapping techniques and the number of wells in the mapping. Discuss uncertainties involved. If the marl is absent under the Savannah River Plant, discuss the basis of that determination. Marl wells 42B/C showed varying water heights from water drawn from within the marl yet the marl is still considered an aquiclude. Explain.

The VEGP power block excavation exposed an upper 25 feet of marl with a surface area of about one million square feet exposed, approximately 1/3 of 1% of the VEGP site. Provide the uncertainty ranges in asserting that no voids, dissolution cavities, systematic fractures, or joints (exclusive of the multiple penetrations thru the marl by confined aquifer observation and production wells) exist that would provide a path for movement of ground water through the marl over the full 3,169 acre site. Provide the uncertainty ranges inclusive of the marl multiple well penetrations.

Discuss the consistently large water level well differences in light of the lack of correlation between the active, confined aquifer observation well water levels.



Provide laboratory permeability tests conducted on core samples from marl exploration holes; provide core sampling techniques, core sample depth, core sample location and other pertinent data. Provide field test correlations for the same core sample locations.

The VEGP has stated the marl depth is 130 feet below the surface. Confined aquifer well 34 does not appear to 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 being located on an interfluvial high. Provide a detailed explanation of where the VEGP interfluvial high is theoretically intact and not intact and relate to the VEGP geography over the entire surface of the plant site and to the marl underlying VEGP. Explain where the marl boundaries are located.

## REFERENCES

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4. Rosenthal, R., Rosnow, R.L. (Eds.), Artifact in Behavioral Research, New York: Academic Press (1969).
5. C. Ashley, C.C. Zeigler, Environmental Monitoring at the Savannah River Plant, Annual Report for 1978, DuPont Report DPSPU-79-302 (1981).
6. W.F. Lawless, The DuPont Management of Savannah River Plant Radioactive Wastes, A report to the U.S. House of Representatives, Committee on Energy and Commerce, Subcommittee on Oversight and Investigations (1984).
7. J.W. Fenimore, Annual Summary of Burial Grid Well Assays-1978, DuPont Internal Report, DPST-79-452.
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9. J.L. Steele, Technical Summary of the A/M Area Groundwater (AMGW) Remedial Action Program, Draft DuPont Rep. (ca. 3/84).
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11. Environmental Monitoring In The Vicinity Of The Savannah River Plant, Annual Report for 1982, DuPont Rep. DPSPU 83-30-1 (ca. 1982).
12. A. Einstein, Sidelights of Relativity, EP Dutton & Co., Inc, NY, p. 27-45 (1923).



ER 84/1449

# United States Department of the Interior

OFFICE OF THE SECRETARY  
WASHINGTON, D.C. 20240

JAN 22 1985

Elinor G. Adensam, Chief  
Licensing Branch No. 4  
Division of Licensing  
Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Ms. Adensam:

Thank you for your letter of November 9, 1984, transmitting copies of the draft environmental statement, operating license stage (OLS), for the operation of Vogtle Electric Generating Plant, Units 1 and 2, Burke County, Georgia. Our comments are presented according to the format of the statement.

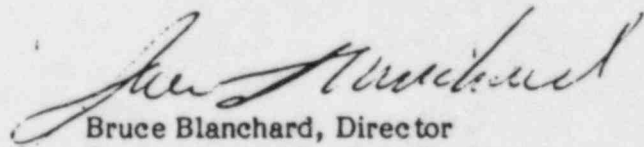
The average rate of ground-water use is given both as 1,333 gpm on page 4-3 and 840 gpm on page 5-5. This discrepancy should be resolved in the final statement. The locations of the deep wells that will supply groundwater to the plant should be shown on a map similar to figure 4-10.

We note on page 4-12 that at present the hydraulic head in the deep aquifer is higher than the river. We believe any reversal of the hydraulic gradient that may be caused by ground-water withdrawals could be significant. It could permit contaminants to enter the major aquifer via tributary streams or shallow ground water and the river. Therefore, the final statement should include probable and worstcase drawdowns in the confined aquifer and corresponding elevations on the piezometric surface of the aquifer calculated for the life of the project, both at the anticipated location of the lowest portion of the cone of depression that will develop, and beneath the river. This information would permit evaluation of the potential for aquifer contamination.

Water levels in the confined aquifer should be monitored at regular intervals to determine the actual hydraulic effects of the plant withdrawals as a basis for future decisions.

We hope these comments will be helpful to you in the preparation of a final statement.

Sincerely,

  
Bruce Blanchard, Director  
Environmental Project Review

8502060030

LP

# Educational Campaign for a Prosperous Georgia

175 Trinity Ave. S.W., Atlanta, Georgia 30303 404-659-5675

## COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT

RELATED TO THE OPERATION OF VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2

U. S. Nuclear Regulatory Commission

NUREG-1087

Georgia Power Company, et al.

Submitted by

Campaign for a Prosperous Georgia

and

Educational Campaign for a Prosperous Georgia

January 4, 1985

*Extra copy of this letter due to the illegibility of this in the enclosure*

### Organizational Background and Summary of Qualifications

The Campaign for a Prosperous Georgia and the Educational Campaign for a Prosperous Georgia are nonprofit organizations concerned about Georgia's economy and environment. Approximately two thousand supporters in more than fifty communities in all parts of Georgia have now signed up with the organizations.

These comments were written by Tim Johnson, Executive Director of both organizations. He has been employed in research and technical positions with the Georgia Public Service Commission, the Georgia Consumers' Utility Counsel, the Southern Regional Council, the Georgia Public Interest Research Group, Magnolia Oil Company and United Oil Industries. He has authored articles on the utility industry. He has served on a Nuclear Regulatory Commission advisory panel on decommissioning of nuclear power plants. He has served as Executive Director of Campaign for a Prosperous Georgia since the organization was founded in January of 1983.

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### Summary of Comments

Plant Vogtle presents a clear danger to the economy and the environment of the state of Georgia. If operated and placed into the rate base, it would cause unprecedented electric rate increases, economic dislocation, rising unemployment, shutting down of industry and small business, inflation and related problems and it could cause unprecedented environmental damage, threaten endangered species, destroy agricultural areas and present the largest human-created environmental catastrophe in history.

The Draft Environmental Statement (DES) issued by the Office of Nuclear Reactor Regulation of the Nuclear Regulatory Commission (NRC) is unacceptable in that it fails to address adequately many of the environmental impacts of the proposed operation of Plant Vogtle, it fails to consider adequately the significant changes which have occurred since issuance of the Construction Permit (CP), it fails to

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consider the fact that the plant is clearly not needed, it fails to consider alternatives which are superior both environmentally and economically, and for other reasons.

### Specific Comments

Originally issued a construction permit for Plant Vogtle in 1974, Georgia Power anticipated annual growth in electricity sales in excess of 10%. Since that time, annual electricity sales growth by Georgia Power in its territory has declined steadily. In no year since the construction permit was originally issued has growth in electricity sales matched the average on which the Nuclear Regulatory Commission predicated the construction permit, let alone the average which Georgia Power forecast. In fact, never has the growth exceeded 6%; the average growth since Georgia Power applied for a construction permit in 1973 has been less than 2%; and the average annual growth in the last six years has been less than 1% (Georgia Power Company Financial and Statistical Review 1973-1983).

During the Atomic Energy Commission hearings on the construction permit application by Georgia Power (April 16, 1974 transcript), Georgia Power executive Bob Scherer told the Commission, "I believe there are still important economies of scale to be gained in the future, particularly in nuclear generation." Scherer added, "...the demand for electricity is relatively price inelastic." Of course, history has proven him wrong on both counts--as other witnesses at the time warned. The decline in growth described above can be directly attributed to a price increase of more than 250% from 1972 through 1982, and to saturation of certain markets (especially air conditioning).

Consequently, Scherer also erred in his forecasts of peak demand. He projected that in 1980, peak demand would be 16,728 megawatts while in fact it was 11,154 megawatts; he predicted a 1981 peak of 18,528 MW and the actual peak was 11,514 MW; and he predicted a 1982 peak demand of 20,528 MW while the actual peak was 10,683 MW; only 12,257 MW. These lowered peaks occurred despite the absence of any serious actions on the part of Georgia Power to control peak demand.

Georgia Power cried wolf during the CP application process, claiming that failure to build the four Vogtle units then planned would cause shortages in the state due to increases in load of "approximately 11 percent annually" (Environmental Report, CP stage, p. 1.2-12). In fact, to meet 1985 needs, Georgia Power anticipated building twelve (12) nuclear units as well as many fossil and hydroelectric units which are not operating; despite the failure to build these facilities, Georgia Power suffers an extraordinary overcapacity (see below).

The Atomic Energy Commission ignored those who said that the Vogtle units would not be needed and granted the construction permits in June, 1974. Within a matter of weeks, Georgia Power cancelled Units 3 and 4 of Plant Vogtle, and they have repeatedly postponed Units 1 and 2. Today, the critics have been proven right--Plant Vogtle was never needed and never will be.

Georgia Power's load factor has steadily declined in the past decade, from 59.7% in 1973 to just 51.9% in 1983. This reflects a tremendous peak relative to base load, precisely the kind of demand curve that requires cutbacks on baseload plant construction and increased use of ways to control the peak (such as radio load control).

Georgia Power is already greatly overbuilt. A 1978 Congressional report stated "Georgia Power Company rated first (in annual cost to consumers of excess generating capacity) with overcharges of \$39 million." (Nuclear Power Costs, US House Committee on Government Operations, 1978) Since that time, the overcapacity problem has become even worse in Georgia as several more coal and hydroelectric plants have begun operation while growth has not been commensurate with this new capacity. In fact, territorial kilowatt-hour sales have increased at a rate of less than 1% per year despite some of the most severe weather conditions ever recorded in Georgia.

In addition to Plant Vogtle, Georgia Power is constructing nine other generating units, including Plant Scherer Unit 3 (818 megawatts), Plant Scherer Unit 4 (818 megawatts), Bartletts Ferry Units 5 and 6 (108 megawatts), Goat Rock Units 7 and 8 (67 megawatts) and Rocky Mountain Units 1, 2 and 3 (847.8 megawatts) (Georgia Power Company Annual Report 1983). Thus, the Company's overcapacity problem will be compounded if and when Plant Vogtle comes on line, particularly in view of the public's increased use of alternative energy sources including conservation.

Georgia Power itself has implicitly acknowledged that it does not need the capacity of Plant Vogtle, as it has repeatedly conceded to the Public Service Commission that it has tried without success to sell the capacity to out-of-state utilities.

Even if additional capacity were needed, Plant Vogtle would not be the best way to provide it. Expert testimony before the Georgia Public Service Commission (PSC) has stated that it may be more prudent economically to invest in alternatives (particularly conservation and solar energy) than to operate Plant Vogtle even if the plant is completed. Clearly, conservation and solar energy are less injurious to the physical and human environment than Plant Vogtle would be. A solar water heating system could be installed in every household in Georgia at less cost than the remaining cost of the Vogtle Nuclear Plant. Said water heaters would provide more energy, would provide more jobs and would have far less negative environmental impact than completion and operation of Plant Vogtle. Furthermore, conservation measures will provide even greater return on the investment than solar water heating. Yet, Georgia Power does not address these issues in its operating license application or supporting documents.

In addition, there is tremendous potential for cogeneration of electricity by industry in Georgia. Due to the lack of adequate compensation--Georgia Power will pay less than one-tenth to cogenerators for a kilowatt-hour of electricity what they will ask from ratepayers--this potential is largely untapped. Tapping it would be far more economic than Plant Vogtle (the fuel is usually free, since electricity is produced from waste industrial heat), it would be much better environmentally (since the fuel is being burned anyway). The cogeneration potential alone in Georgia is greater than the output of Plant Vogtle would be, not even considering the likelihood that Plant Vogtle will be broken down much of the time (Georgia Power's Plant Hatch, its only operating nuclear plant, has been broken down more than forty percent of the time).

The PSC has begun to question whether Plant Vogtle will be needed. In Georgia Power's most recent rate case, the Commission reversed its previous practice and disallowed Plant Vogtle's nuclear fuel from the rate base, stating in its final order dated January 17, 1984, "Of course, at the present time, Plant Vogtle is not operational and it is not expected that it will produce electricity for several more years, if at all...It is the Commission's position, as it has made clear from previous orders, that to be included in rate base an investment must be used and

useful to the retail ratepayer, if not immediately, at least in the reasonably near future. In the context of the nuclear fuel purchased for Plant Vogtle, since the plant itself is not yet in operation, it is obvious that the nuclear fuel purchased by the Company for use in that plant is not currently used or useful to the retail ratepayer, and cannot be for some time, if at all." (emphasis added) (Ga. PSC Docket No. 3397-U, Order on Reconsideration, January 17, 1984, pp. 3-4) It is important to note that in past cases, the PSC allowed the Vogtle fuel to be included in the rate base although the plant was further from operation than in 3397-U, demonstrating that a key concern to the PSC is whether the plant will ever be "useful" as well as whether it will ever be "used."

It is clear that Plant Vogtle is not needed either to meet increased energy needs or to replace older, less economical generating capacity. Increases in consumption have been far below the projections on which the construction was based, and new nuclear, coal and hydroelectric generating plants which have come on line since the construction permit for Plant Vogtle was issued already provide far more additional capacity than is needed.

Furthermore, it is clear that the running costs alone of Plant Vogtle would exceed the total costs of many environmentally preferable alternatives, including cogeneration using existing industrial process steam, conservation measures including increased insulation of homes, and certain applications of solar energy for water and space heating. These alternatives would be of insignificant environmental impact relative to the operation of Plant Vogtle.

As conditions relating to economics, electric consumption patterns, and availability of alternative energy sources have changed since the construction permit was issued for Plant Vogtle, the NRC must at this time make a full assessment of the current and future need for the plant, as required by the National Environmental Policy Act and the regulations.

As described above, it is clear that Plant Vogtle is not needed. As even Georgia Power acknowledges, the PSC must ascertain prudence of Georgia Power investments before allowing them to be included in the rate base. If a facility is imprudent or is not used and useful for ratepayers, the PSC should refuse to allow it to be charged to the ratepayers.

If the PSC determines that an overcapacity exists--that certain capacity is not useful for retail ratepayers--then the PSC will not allow Georgia Power to include in rate base the most expensive (and therefore least prudent) portion of new capacity representing the percentage of overcapacity needed to bring the Company down to a level commensurate with safe reserve margins. Plant Vogtle is by far the most expensive capacity under construction. In fact, Plant Vogtle, according to Georgia Power, will cost \$7.2 billion to construct (including financing during construction) while all production plants in operation at the end of 1983 combined cost only \$2.9 billion (Georgia Power Company Financial and Statistical Review 1973-1983). The fact that Georgia Power has sold all electrical capacity in the four Scherer coal-fired units through 1992 (Georgia Public Service Commission Docket #3397-U), and that the electricity from the Scherer coal plants will be substantially cheaper than that from the Vogtle nuclear units, increases the likelihood that the PSC will conclude that Georgia Power acted imprudently in constructing the Vogtle nuclear units.

In addition, the PSC may look at the prudence of alternative investments, such as conservation and alternative energy. Expert testimony before the PSC in a



previous proceeding has stated that it may be more prudent economically to invest in alternatives (particularly conservation and solar energy) than to operate Plant Vogtle even if the plant is completed. This increases the likelihood that the PSC will exclude Plant Vogtle from the rate base.

As mentioned above, in its final order dated January 17, 1984, the PSC ruled, "Of course, at the present time, Plant Vogtle is not operational and it is not expected that it will produce electricity for several more years, if at all... It is the Commission's position, as it has made clear from previous orders, that to be included in rate base an investment must be used and useful to the retail ratepayer, if not immediately, at least in the reasonably near future. In the context of the nuclear fuel purchased for Plant Vogtle, since the plant itself is not yet in operation, it is obvious that the nuclear fuel purchased by the Company for use in that plant is not currently used or useful to the retail ratepayer, and cannot be for some time, if at all. As a consequence, the Commission finds as a matter of fact that the nuclear fuel purchased by the Company for use in Plant Vogtle should be excluded from rate base." (emphasis added) (Ga. PSC Docket No. 3397-U, Order on Reconsideration, January 17, 1984, pp. 3-4) It is important to note that in past cases, the PSC allowed the Vogtle fuel to be included in rate base although the plant was further from operation than in 3397-U, demonstrating that a key concern to the PSC is whether the plant will ever be "useful" as well as "used."

Campaign for a Prosperous Georgia believes that the PSC will disallow Plant Vogtle as not used or useful even if said plant is completed and Georgia Power attempts to place it in the rate base.

The Georgia Public Service Commission has recently ruled that a complete review of Georgia Power's construction program will be required before any further financing will be allowed. This ruling preceded by less than three weeks an announced bond issuance totalling \$150 million and came in a proceeding in which Georgia Power requested permission to obtain \$750 million for construction-related expenditures. The Fulton County (Georgia) Superior Court upheld the PSC's authority in this case and, acting under court order, the PSC denied the Company's request for the first \$150 million bond offering. The PSC eventually allowed the financing to proceed pending a review of the Company's overall construction program. If the review finds that the construction is imprudent--a likelihood if it is done objectively--it will likely result in PSC refusal to allow Plant Vogtle to be included in the rate base, even if the NRC licenses it.

Failure to collect a return on Plant Vogtle would likely cause Georgia Power to cut corners on safety in order to save money. This is clear as Georgia Power employees attempted to override safety systems at Plant Hatch in order to prevent a shutdown and save fuel costs.

Georgia Power itself has implicitly acknowledged that it is in financial trouble. In the 1984 financing proceeding, the Company requested a sinking fund provision to protect potential investors. According to the Company witness (under cross-examination by Campaign for a Prosperous Georgia), the last time the Company used such a provision was 1975, a time when the Company nearly went bankrupt and required two emergency rate increases to remain solvent.

Another potential financial burden which the Company has failed to address is the impact of changes in federal income tax accounting being considered by Financial Accounting Standards Board and the U.S. Congress. These changes could remove or reduce tax incentives for unneeded construction, particularly in cases where

conservation and other renewable energy has not been aggressively promoted. According to Georgia Power, its total accumulated deferred income taxes (net) at the end of 1983 totalled over \$800 million (Georgia Power Company Financial and Statistical Review 1973-1983); hundreds of millions of dollars more in investment tax credits might be "flowed through" to consumers by the regulators if the changes being considered are implemented. Similarly, recent tax reform proposals from Donald Regan would, if implemented, remove the investment tax credits and accelerated depreciation that Georgia Power now enjoys.

Georgia Power will be unable to safely operate the facility and will be unable to safely shut down and maintain the facility in the face of these self-inflicted financial difficulties. In order to save money, Georgia Power will attempt to bypass safety considerations (as it has already done at Plant Hatch), operating the facility despite indications of safety problems, failing to file Reportable Occurrences and skimping on quality of workmanship and materials. The Company will be unable to safely shut down and decommission the reactor upon completion of its operating life (or in the event of a major accident) due to these financial considerations, and will be unable to safely dispose of spent nuclear fuel and other radioactive wastes due to the financial problems.

Furthermore, partners in the project will be unable to financially offset Georgia Power's inability to safely operate the plant. Indeed, it may be difficult for the partners to finance their shares of the facility. The financial burden faced by the other partners--Oglethorpe Power Corporation (and its thirty-nine member electric membership corporations), Municipal Electric Authority of Georgia (and its forty-seven members) and the City of Dalton--far exceeds their entire assets. Recent efforts by the Reagan Administration to remove financial guarantees for electric cooperatives will, if successful, have substantial impact on Oglethorpe's ability to finance its share of the facilities. The Washington Public Power Supply System's municipal members defaulted on their share of that five-unit nuclear project, and the cities in Georgia may face a similar situation. MEAG has estimated that its share of Plant Vogtle will cost approximately \$2.3 billion; this compares with the entire general bonded indebtedness of all its members of less than \$128 million, less than one-seventeenth their share of Plant Vogtle (Official Statement, \$300,000,000, Municipal Electric Authority of Georgia, General Power Revenue Bonds, 1984A Series, Dated March 1, 1984).

Failure by the NRC to consider these matters would constitute a violation of NEPA. Although the Commission passed a regulation excluding consideration of financial capability (a regulation thrown out by federal court, passed again by the NRC, and once more in litigation), that regulation was based on the assumption that state regulators would allow a utility to charge ratepayers for any operating plant. The Georgia Public Service Commission has explicitly stated that it will not allow Georgia Power to charge ratepayers for any plant that is not useful (see above), even if it is used. Thus, even if the NRC's generic rule on financial qualification is upheld by the courts, it should be waived in this instance.

The increased danger presented by the financial inability to operate the plant also presents further evidence that alternatives would be environmentally preferable, since cogeneration, conservation, solar energy and coal do not present the potential for catastrophe in case of a single accident that nuclear power presents.

The DES also fails to address adequately the potential danger from earthquakes at the sight.

The U.S. Geological Survey has pointed out to NRC that "after several years of intensive study in the Charleston region, no geologic structure or feature can be identified unequivocally as the source of the 1886 Charleston earthquake." (letter from James F. Devine, Assistant Director for Engineering Geology, USGS, to Robert E. Jackson, Chief, Geosciences Branch, Division of Engineering, NRC, dated November 16, 1982)

The Charleston earthquake was the among the worst ever recorded in American history and was more intense than the San Francisco earthquake. USGS in 1887 said of the Charleston Earthquake, the "area within which motion was sufficient to attract...attention would be somewhat more than that circumscribed by a circle of a thousand miles radius. Six hundred miles from the origins, the long swaying motion was felt and was often sufficient to produce seasickness (nausea)." USGS reported that the earthquake was felt in the Adirondacks; Ontario, Canada; Michigan; Milwaukee and Green Bay, Wisconsin; and even Cuba. In eastern Kentucky and southeastern Ohio, "chimneys and bricks were shaken down." USGS went on to say, "In all of the large towns within two hundred miles of Charleston, more or less damage was suffered...dams were broken (on the Savannah River and near Barnwell)...At Augusta, 110 miles distant from the epicentrum, the damage to buildings was considerable...(For example) at the Arsenal, the commanding officer's residence was so badly cracked and shattered as to necessitate practical reconstruction...In Atlanta, 250 miles distant, there was no worse injury than falling chimneys and some slight cracks in the wall, but the houses were instantly abandoned in great alarm and confusion by their occupants, and many preferred passing the night in the streets to re-entering their dwellings."

The situation in Charleston itself was, of course, even worse. The words of an eyewitness survivor are particularly relevant to this proceeding:

...It was upon such a scene of calm and silence that that shock of the great earthquake fell, with the suddenness of a thunderbolt launched from the starlit skies; with the might of ten thousand thunderbolts falling together; with a force so far surpassing all other forces known to men that no similtude can truly be found for it. The firm foundation upon which every home had been built in unquestioning faith in its stability for all time was giving way...For a few moments all the inhabitants of the city stood together in the presence of death, in its most terrible form...

(Within one minute) Every home in the city had been broken or shattered--and beneath the ruins lay the lifeless or bruised and bleeding bodies of men, women and children, who had been stricken down in the midst of such security as may be felt by him who reads these lines at any remote distance of time or space."

The Vogtle area is of a similar geology to Charleston and therefore poses a risk of a devastating earthquake, far worse than that upon which the plant design is based. In fact, at the time the CP was issued, the USGS maintained that the Charleston Earthquake was centered in Charleston, and the CP and plant design are based on the assumption that the worst seismic activity expected to occur at Plant Vogtle during the forty years of the operating license and the unspecified period before (if) decommissioning removes the radioactive remains from the site would occur in conjunction with such an earthquake at Charleston. The fact that USGS has changed its position with regard to the Charleston Earthquake constitutes new information which is not adequately considered in the DES. In order to assure conservative consideration of the seismic dangers for Plant Vogtle, the DES should

analyze the results of an earthquake of the magnitude of the Charleston Earthquake occurring at the plant site.

Another question inadequately considered in the DES is thermal shock. Thermal shock and the effects of operator response, neutron irradiation, and pressure vessel steel impurities remain an unresolved scientific question. Pressurized water reactors are susceptible to cracking of the reactor vessel due to severe drops in vessel temperature under high internal pressure. Neutron irradiation of the reactor vessel, especially at the midline, weakens the vessel and raises the reference temperature at a rate dependent on the impurities in the steel and welds and the rate of neutron irradiation. Studies by the Oak Ridge National Laboratories showed that conditions created during a routine transient at Rancho Seco reactor near Sacramento, CA might be enough to cause cracks in older irradiated pressure vessels. Further analysis and model simulations showed that whether pressure vessel ruptures would or would not occur in a Rancho Seco type transient depended on the operator response. If the model assumed correct operator response then the simulations indicated the pressure vessel would not rupture during the life of the reactor. Conversely, if the model assumed incorrect operator response, the reactor vessel would be subject to rupture within 3 or 4 years of start-up. Thus, protection from reactor vessel rupture seems to depend totally on operator response and not on redundant safety features built into the plant (Marshall 1981, 1982).

The reactor vessel for Plant Vogtle contains 0.10-0.12% copper and 0.012 to 0.020% phosphorous (FSAR sec 5.3.1.1) but no discussion is undertaken by the DES as to the effects of these levels of impurities on accelerated brittleness and increased reference temperature for the pressure vessel. The DES also does not consider the effect of varied fuel rod geometrics on pressure vessel embrittlement. In general, the DES does not consider the long term safety hazards posed by the problems of thermal shock combined with the effects of vessel material impurities, embrittlement due to irradiation, and the confounding effect of operation error.

A major concern of Campaign for a Prosperous Georgia is the failure of the DES to consider adequately the value of and danger to the groundwater underlying the Plant Vogtle site, particularly the Tuscaloosa Aquifer. The groundwater underlying the Vogtle Plant is a valuable resource whose protection is not assured by the DES.

The DES fails to address adequately the fact that, contrary to assertions by the Applicants, radioactive contamination of the Aquifer could occur from spillage at Plant Vogtle. This is evidenced by contamination of the Tuscaloosa Aquifer by the Savannah River Plant directly across the river.

Approximately 300 feet below the surface is the Tuscaloosa Aquifer, a permeable sand formation which contains large volumes of excellent quality water. This aquifer is an important regional aquifer which supplies water to many cities and communities across central Georgia and much of the South Carolina coastal plain. In eastern central Georgia, the Tuscaloosa Aquifer is the major source of water for many communities. In Richmond County just north of Plant Vogtle, eighteen Tuscaloosa wells provide water for 15,000 people. In Girard, which is approximately five miles from the plant, and McBean, only thirteen miles away, the Tuscaloosa provides drinking water for most of the community residents.

The Tuscaloosa Aquifer is not the only valuable groundwater resource underlying the plant site. At a depth of approximately 200 feet below surface and a thickness of approximately 100 feet, the sand member of the Lisbon Formation also represents a valuable groundwater resource for the area. Cooling system make-up water wells for

the plant which penetrate and are open to both the Lisbon Sand Formation and the Tuscaloosa Aquifer can provide as much as two thousand gallons per minute of excellent quality groundwater. This groundwater is not only important as an existing source of drinking water but it is important to future development which is likely to occur along the Savannah River corridor.

Directly below the surface at the Vogtle Plant is the water table aquifer. While this aquifer is not as areally or vertically extensive as the Tuscaloosa or Lisbon Sand Formations, it is used extensively in Burke County as a source of drinking water for numerous domestic supply wells, as a small scale agricultural supply and for some commercial establishments. To these individuals, farmers and businesspeople, loss of this source of water through contamination from Plant Vogtle could endanger health and cause economic hardship.

In the case of a release of radionuclides to the ground at Plant Vogtle, the water table aquifer would be the first and the most seriously impacted owing to its close proximity to the surface. In the area of Plant Vogtle, soils are permeable and virtually no runoff of rainwater occurs. Any release of radionuclide contaminated water would seep immediately into the ground and eventually reach the water table aquifer. The sandy nature of the soils and the aquifer material would offer little retention of radionuclides. The radionuclides would migrate with the groundwater and contaminate larger portions of the aquifer.

A significant contamination incident could result in contamination migrating vertically downward from the water table aquifer into the deeper Lisbon Sand Formation and the Tuscaloosa Aquifer. While a clay separating the water table from the deeper aquifers may provide some protection for the deeper aquifers, the 50 feet of hydraulic head on the water table aquifer acts as a vertical force on the groundwater, pushing it through fractures or more permeable sections of the clay. It is known that just south of the plant site, this clay changes into a limestone, becoming part of a major regional water supply aquifer, the Principal Artesian Aquifer.

The Georgia Power Company's record of groundwater protection is not encouraging as demonstrated by events at the Hatch Nuclear Plant. Groundwater underlying Plant Hatch has been contaminated with tritium from a source or sources never fully identified. (See, for example, HNP Annual Report to NRC, 1979 and 1980.) The DES does not address this concern.

The DES also fails to consider adequately the impacts of the withdrawal of groundwater and Savannah River water on supplies. It fails to consider the impact of the proposed operation of a hydroelectric project in Augusta, Georgia, which is expected to severely affect the levels of the Savannah River. Pulling 20,000 gallons per minute of water out of what may already be severely depleted water flow could have consequences far more severe than considered in the DES.

The DES fails to address adequately the danger presented to the environment by the inadequacy of the quality assurance program at Plant Vogtle.

The success of a quality assurance program is ultimately tied to the generation of adequate confidence concerning the correct functioning of critical nuclear power plant systems and components.

Repeated violations of NRC regulations by Applicant in the construction methods applied to pipe-fitting, welds and other areas must be interpreted as undermining

confidence in the capability of coolant and containment systems to perform their essential tasks.

Although potential deficiencies involving welds in containment liner penetrations had been raised as an issue at least as early as April 29, 1981 (I & E file #X7BG03-M18), problems involving the appropriate inspection of welds have occurred at least as recently as September 1983.

Violation notification has been issued in several instances related to implementing the required test procedures. As indicated in IR 50-424/83-15 Appendix A, the applicant's construction sheet for examination of reactor coolant pressure boundary welds did not specify the penetrant examination test required by NRC. Such a failure, not simply in the execution of a prescribed test, but the omission of the test from the required procedure, certainly reduces the confidence in the correct functioning of a vital reactor safety system.

Failure to assure that non-destructive testing is conducted consistent with applicable codes led to another violation as reported in IR-50-424 and 50-425. In this instance grit-blasting of the closure head weld cladding of Plant Vogtle Unit 1 (IE X7B610) was performed after liquid penetrant examination of the component. This represented not only a departure from the standard procedure of performing the examination on the component in its finished condition but an unintended method of degrading a critical steam system component after its final installation and inspection. This is much more than a flaw in an isolated procedure; it is a basic failure in established quality assurance methodology.

Any adequate quality assurance program must take into account a broad range of "planned and systematic actions necessary" to establish confidence in the system in question. Any quality assurance program predicated exclusively on the implementation of dictated procedures without regard to the exercise of critical judgement and standards of professional practice must be considered woefully inadequate. In an examination of welding activities involving steel structures and supports in both Units 1 and 2 of Plant Vogtle, the applicant was cited for failure to include the heat-affected zone (HAZ) of the weld in acceptance radiographs (IR 52 50-424 Appendix A Report Details). In response to the notice of violation, the applicant defended its procedure by replying that the Code "gives no requirement for including the heat-affected zone in the area of interest" (X7B610). This response, which erroneously equates methods of quality assurance with simple compliance to written procedures, was so unacceptable to the NRC that it was directly criticized by Richard C. Lewis even though the violation itself had been withdrawn. In his words,

"Interpretations of the code by 'Code Experts' make your response appear to set aside engineering reason when you consider that, based on failure analysis experience, the technical world realizes that the heat affected zone of a weld is the most critical area of the weldment."

In a related matter on November 18, 1982, welding on sections of the containment dome of Unit 2 was conducted during a "very light misty rain." The welding and site QA supervisors felt that the conditions were suitable for welding since the surfaces of the pieces involved were not completely covered with moisture (425/82-29-02). The inspector, more concerned with the quality of the weld than with the "General Welding Procedure Specification for Shielded Metal Arce Processes," prevailed upon the two to stop the work for the day.

The applicant's disposition to prefer restrictive implementation of prescribed procedures to the more circumspect methods of professional practice does not contribute to confidence in the proper functioning of a completed and operating Plant Vogtle.

In addition to these procedural aspects of quality assurance, there are other questions involving the applicant's "controlling the quality of the ...component or system to predetermined requirements." In the case of quality control the repeated discovery of inadequacies and defects in the performance of an essential safety subsystem would generate a cause for concern. Furthermore, at some point in time, good quality control practice mandates the abandonment of a suspect manufactured article in favor of a more reliable alternative.

The number of past and continuing failures of the Georgia Power/Bechtel QA/QC program represents a pattern which indicates an undue risk to the health and safety of the public. Violations involving activities at times resulted from failure to provide documented procedures. (For example, Report No. 50-424, 50-425/83-04 regarding concrete QC problems)

The severity of Quality Assurance performance at Plant Vogtle forced a meeting conducted 22 August 1983 at Georgia Power headquarters on the subject of Subcontractor Quality Assurance Allegation by Pullman Power Products quality control personnel about pipe support installation and piping installation as well as job intimidation of quality control workers. Allegations had been made by a Walsh Company boilermaker that improper welding and work practice had occurred. Twenty-three concerns which dealt with twelve separate items were discussed. Defects were found during the reinspection of Pullman Power Products manufactured piping spool pieces. (Letter from James P. O'Reilly to Georgia Power, 28 September 1983, Subject: Summary of Meeting--Docket Nos. 50-424 and 50-425, Vogtle 1 and 2).

Countless other specific problems with Quality Assurance, outlined in filings with the Atomic Safety & Licensing Board in the operating license proceeding for this facility and described in numerous documents, also exist. These increase the danger to the public and increase the potential for significant damage to the environment. Yet the DES fails to address these concerns.

The DES also fails to consider the potential environmental impacts of the failure of certain equipment at Plant Vogtle to withstand the conditions of an accident.

The concept of environmental qualification, i.e. that safety systems must be able to survive and perform their functions under accident conditions, is fundamental to NRC regulation of nuclear power reactors. Safety is the "first, last and permanent consideration" and can lead to the shutdown of noncomplying plants. Power Reactor Development Corp. v. International Union of Electrical Radio and Machine Workers, 367 U.S. 396, 402 (1961).

Applicant has not demonstrated that its present safety systems testing methods, VEGP FSAR Table 3.11.B.1-1, Figures 3.11.B.1-1, 3.11.B.2, are adequate to ensure effective operation under emergency conditions. For example, in investigating accelerated aging of materials, Sandia Laboratory has found that many materials experience greater damage from lower as opposed to raised dose rates when the total integrated dose is the same. Proceeding International Meeting on Light Water Reactor Severe Accident Evaluation, August 1983, TS-3.1; Industrial Research and Development, June 1982 at 55-56. Particularly sensitive are polymers which are

found in cable insulation and jackets, seals, rings and gaskets at VEGP. Current methods of testing have used high levels of radiation or only reported the integrated dose (VEGP FSAR, Table 3.11.B.1-1) and therefore underestimate the effects of the total dose. NUREG/CR-2157, "Occurance and Implications of Radiation Dose-Rate Effects for Material Aging Studies," June 18, 1981. The effects of synergisms, involving the combined effects of radiation, heat and in some experiments oxygen concentration, were also studied at Sandia. The greatest amount of degradation was found upon exposure to heat followed by exposure to radiation (significantly affected by oxygen during a LOCA simulation). NUREG/CR-2156, "Radiation-Thermal Degradation of PE and PVC: Mechanism of Synergisms and Dose-Rate Effects," June 1981.

Sandia has also identified other interesting "anomalies." "Proceedings, International meeting on Light Water Reactor Severe Accident Evaluation (August 28-September 1, 1983) Cambridge." In tests of EPR cable material, multiconductor configuration performed "substantially worse" than single conductor configurations. Sandia concluded that qualification testing employing only single conductors as test specimens may not be representative of multiconductor performance. Testing of terminal blocks by prior industry standards (function before and after accidents) is not adequate. Instead, applicant must show equipment can function during accident conditions. Simulation of these conditions led to instrument reading errors on high resistance instruments of 15-90%, which were not conservative. This could have led real operators to think that there was adequate subcooling when in fact the degree of subcooling was significantly less.

The results of these reports have not been applied to environmental qualification testing performed and referenced by Applicant to demonstrate compliance of safety-related equipment and components with applicable standards.

Several pieces of equipment specified in VEGP FSAR Table 3.11.N.1-1 as being environmentally qualified may in fact be unqualified. For example, on August 31, 1983, NRC issued a Board notification transmitting a summary of a staff investigation into Franklin Research Center tests on solenoid valves. Over half the valves failed in tests simulating normal and accident conditions. BN 83-128.

Several valves manufactured by ASCO failed early after exposure to 340 degrees F., i.e., they had little or no time to perform their safety function before failing. Over one year earlier ASCO's own testing had shown poor performance of these valves, and had reported this to the EQB. The EQB memo from R. Vollmer to D. Eisenhut (included in BN83-128A) stated the staff "continues to approve" the qualification of valves on the basis of 1978 tests. The applicable standard in 1978 was IEEE 382-1980. The EQB concluded that the early failure of the ASCO solenoid valves makes them unacceptable for use in safety systems and suggested that licensees and applicants be prohibited from using the valves in any application where conditions could be more severe than those reported in the qualification test report. VEGP FSAR Table 3.11.N.1-1 shows the use of twenty-three separate ASCO solenoid valves. The function of some of the valves is not listed and in no case is the qualification reference listed.

Also shown as qualified are forty-three (43) separate motor operators manufactured by Limitorque. The company's own testing, see IE Notice 81-29, EEQN No. 1 (September 24, 1981), had shown motor failure on initiation of steam spray accident profile. An update, IN 82-52, simply noted that "this is an ongoing problem." Westinghouse performed further tests and concluded that "the present motor design will not successfully pass Westinghouse specified test parameters."



The NRC staff has only confirmed that they will pass IEEE 323-1971, a standard explicitly rejected by the Commission in CLI-80-21 as virtually useless.

A critical safety component in LOCA is the post LOCA hydrogen recombiner. One common type of unit manufactured by Rockwell International has recently been shown to have a large number of defective parts. EEQN No. 14 in IN 83-72 (10/28/83). For example, ITT pressure transducers failed typical IEEE 323 environmental qualification testing, i.e., they would not withstand radiation doses of  $1 \times 10^7$  rad and showed gradual drifting of readings after  $1 \times 10^4$  rads. Other hydrogen recombiners may suffer similar problems.

The applicant has not satisfied 10 CFR 50.48 which requires a showing that safety equipment is capable of surviving a fire in order to shut the plant down. Since the NRC has no testing program to establish that the necessary safety equipment is qualified to withstand the fire environment, there is no assurance that the applicant's equipment can withstand such conditions as high humidity, high temperature, spray, corrosive gas, smoke, all of these probably combined with radiation. Commission meeting of January 6, 1984, Tr. at 36; without this assurance, Plant Vogtle should not be allowed to operate.

The DES fails to address adequately these concerns.

Applicant has not determined that suitable seismic qualifications of safety related equipment have been used in selecting equipment for VEGP. The design criteria and methods for seismic qualification of equipment in nuclear plants have undergone significant change. Consequently, the margins of safety provided in existing equipment to resist seismically induced loads may vary considerably and must be reassessed. NRC "Unresolved Safety Issues Summary," August 20, 1982. Again, the DES fails to address this concern adequately.

At the Commission meeting of January 6, 1984, Sandia Laboratories reported numerous "shortcomings" in qualifications methodologies used to test safety equipment. For example, compounded effects (related to the order in which several conditions are tested) can be very important and produce nonconservative results (under testing). A broad range of generally accepted methods was also questioned which included:

- Can gamma radiation adequately simulate the effects of beta radiation?
- Is it necessary to include oxygen in LOCA simulation chambers?
- Under what circumstances is the Arrhenius methodology for accelerated thermal aging valid?
- Are mechanical stresses significant in aging of electrical equipment (cables, seals)?
- Are the procedures of IEEE standards for qualifying specific type of electrical equipment adequate?

These criticisms and questions about current environmental qualification method raise fundamental doubts about the applicant's ability to employ only environmentally qualified equipment in all required applications. The DES again fails to resolve these concerns.

Applicant has not accurately defined the parameters of an accident which would affect the operability of safety-related equipment. Furthermore, Applicant has underestimated the period of time safety-related equipment will be required to operate. S. H. Hanauer, NRC, perceived this issue as a problem shortly following

the accident at Three Mile Island Unit 2:

"I think that as a result of the TMI accident we have to rethink:

1. Environmental Qualifications Envelope
2. Things which may have to be qualified

Changes in my thinking include:

1. Core damage is credible
2. Long-term plant operation is essential, initiation isn't enough
3. LOCA and SLB may not give an envelope that includes TMI experience."

--Note from S. H. Hanauer  
NRC Assistant Director for Plant Systems  
Division of Systems Safety  
April 6, 1979

Such thinking was reiterated by Robert Pollard, Nuclear Safety Engineer of the Union of Concerned Scientists and formerly with the NRC:

I think it is clear that what is needed is essentially a reassessment of the environmental qualifications of safety related equipment in light of lessons learned from the accident."

--Special Prehearing Conference, TMI-1 Restart Hearing,  
Docket No. 50-289, November 8, 1979, TR at 236.

The failure of the DES to resolve these concerns is another demonstration of the inadequate consideration of the potential environmental impact.

The DES fails to consider adequately generic problems with Westinghouse reactors.

Westinghouse PWR steam generator tubes have shown evidence of corrosion-induced wastage, cracking, reduction in tube diameter, degradation due to bubble collapse water hammer and vibration-induced fatigue cracks. Of primary concern is the capability of degraded tubes to maintain their integrity during normal operation and under accident conditions. NRC "Unresolved Safety Issues Summary" August 20, 1982.

The DES does not adequately address and the applicant has not considered nor is sufficient technical information currently available to deal with a steam generator tube rupture (SGTR) accident. This was considered in a hypothetical study of the Borssele Nuclear Power Station. NRC BN 83-151. The TMI-2 accident convinced Westinghouse to change the ECCS actuation logic by eliminating the low pressurizer level trip, and this was implemented by licensees with Westinghouse plants. The simulated SGTR accident at Borssele was calculated to actuate the ECCS which would probably produce "undesirable attendant problems, such as RCP trip and containment isolation, which would make accident management more difficult." Memo from D. J. Mattson, Director DSI, NRC to D. Eisenhut, Director Division of Licensing, NRC, September 26, 1983. As stated in the above-described memo the NRC staff feels a revision of the ECCS logic to the pre-TMI accident configuration "has the potential to improve the management of SGTR events." However, the staff did not conclude whether this "revision would have an overall net increase or decrease in plant risk."

The DES assessment of the potential impacts of chlorine emissions and salt emissions from the plant is inadequate.

The VEGP FSAR 5.5.1.1 estimates an approximate salt drift of 305 pounds per acre per year (see CP SER 5.3.2) within a one mile radius of the cooling towers, assuming a two-unit operation. Naturally this amount would decrease at greater distances. No mention was made of chlorine releases, although this point was brought up by NRC staff at the Construction Permit Hearing. Chlorine could be emitted from these towers, since chlorine is injected directly into the circulating water system, with a maximum system design chlorine rate of 10,000 lb/day. Thus there is the potential for the release of thousands of pounds per day of chlorine both in cooling tower emissions and in water emissions. This is not addressed in the FES-CP or OLSEG (see section 3.6.4.2) and could pose a serious environmental problem. In the VEGP-OLSER-Q-E290.3 the rate of salt drift emission of 305 lb/acre/year is admitted to be presently considered in the range of potential damage to vegetation.

Failure to address these concerns adequately is a serious shortcoming of the DES.

The Emergency Response Plan has not yet been developed by the Applicant. Unless and until an adequate plan is developed, the Environmental Statement cannot adequately consider potential environmental impacts.

The DES fails to address adequately the unacceptable use of diesel generators manufactured by Transamerica Delaval, Inc. (TDI) for emergency backup power. In an emergency, adequate and fast power must be available to operate the emergency equipment. TDI's record is abysmal; there is an excellent chance that Plant Vogtle could not be safely shut down if these generators are not replaced. Obviously, failure to consider this represents a major failure in assessing potential environmental impacts.

The standby steam generators manufactured by Transamerica Deloal have been riddled with problems. The applicant was notified of such problems as early as December 1981. That defect involved the governor lube oil cooler assembly and, according to Transamerica Deloal, "could result in engine non-availability." The applicant itself reported a starting air valve assembly problem (X7B603-M29) that also "could result in engine non-availability." Likewise problems with piston skirts, reported in October 1982, in the applicant's own analysis (X7B603-M36) could, postulating a common mode failure, "cause the failure of both engines, resulting in a loss of power to both trains of the emergency core cooling system and most of the emergency safety features equipment."

In a report of a defect in the engine mounted electrical cables submitted to the NRC in September 1983, TDI also noted a potential engine performance deterioration. Many other problems with TDI generators have also occurred.

The applicant's responsibility for quality control extends beyond collection of individual defect notification and corresponding remedial action. By failing to make a general assessment of the suitability of the TD diesel generator system for such an extremely important emergency function, the applicant has brought its own quality control capabilities into question, undermining confidence in the safe functioning of its operating plant in direct contradiction to NRC QA requirements. The failure of the DES to address this concern similarly undermines confidence in its assessments.

The DES fails to address adequately the potential impacts of radioactive releases on the environment either during normal operating conditions or during emergencies.

Another major inadequacy of the DES is its failure to adequately consider the various problems related to the location of Plant Vogtle in such close proximity to the Savannah River Plant nuclear weapons facility. Cumulative impacts of radiation releases to the air, water and land and synergistic effects of accidents at one plant and their effects on operations at the other are just two examples of the potential negative consequences of such close operations. The DES fails to resolve these concerns. The proposed operation of the L-Reactor at SRP will only make the effects on the environment of Plant Vogtle's operation greater, yet the DES fails to resolve this concern.

The DES fails to address how NRC will determine the source of radioactive releases to the environment with two major nuclear facilities operating next to each other.

The DES fails to address adequately the impacts of transmission lines from Plant Vogtle on the environment. Running lines through Ebenezer Creek National Landmark when there is a more benign alternative route is unacceptable. Endangered species may be affected by the lines and, since the plant is not needed, the alternative of not building it would remove any doubt about effects on the endangered species; the DES does not address this. The DES fails to adequately address the health danger from nonionizing radiation emitted by the transmission lines, despite the availability of much new evidence since the CP was issued.

The DES states that conversion to a single-port instead of a multi-port discharge will decrease the area of discharge. It fails to address adequately the effects of greater heat discharge at one point with the single-port than with the multi-port. If the single-port is environmentally preferable, why was the multi-port chosen for the CP? If the multi-port is environmentally preferable, then why is the single-port chosen for the OL DES?

The CP stated that 1011 acres would be cleared for what was to be a four-unit plant. In fact, 1492 acres have been cleared for what is planned to be a two-unit plant. The DES fails to address adequately the reasons for this change or whether it is a violation of the regulations.

The DES states that the Savannah River will provide "dilution water for liquid radwaste discharge." It fails to point out that merely mixing radioactively contaminated water which does not meet emissions standards with clean water before dumping it into the Savannah River has no effect on the total radiation being put into the river.

The DES fails to consider adequately the potential impact on several threatened and endangered species, including the hairy rattlesnake (Baptisia arachnifera), the persistent trillium (Trillium persistens), the green pitcher plant (Sarracenia oreophila), the wood stork (Mycteria americana), the red-cockaded woodpecker (Picoides borealis), the bald eagle (Haliaeetus leucocephalus), the Bachman's warbler (Vermivora bachmanii), the American alligator (Alligator mississippiensis), the eastern indigo snake (Drymarchon corais couperi), the Florida panther (Felis concolor coryi) and the shortnose sturgeon (Acipenser brevirostrum). The potential impacts on these species of operations of Plant Vogtle in normal conditions or

accident conditions could seriously threaten one or more of these species by radiation, chlorine, transmission lines, construction, heat or other means.

The DES fails to consider the potential danger posed by additional fogging or other weather impacts of the cooling towers, particularly in view of the heavy fogging which occurs in this area.

The DES fails to consider adequately the socioeconomic impacts of plant operations on the community and on the state.

The DES fails to address adequately the impacts of the fuel cycle on the environment.

The DES claims that decommissioning will have minimal impact on the environment, yet no plan yet exists for decommissioning the reactor.

The DES fails to consider the potential impact on the plant of dam failure of any of the dams upriver from the plant.

The DES fails to address adequately the impact on historical and cultural resources. For example, no mention is made of the Francis Plantation, which is listed on the National Register of Historic Places. It has been proposed that a Vogtle transmission line be routed across the Plantation and that a building at the Plantation be moved to make room for the transmission line.

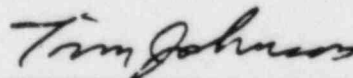
The DES assumes that alternatives to Plant Vogtle will be more expensive but offers no justification for this assumption beyond a generic rulemaking to that effect. Apparently, no effort was made to assess whether this holds true for Vogtle, even under the NRC's methodology, and consequently whether an exception should be made in this case; clearly it should.

The DES fails to address adequately the long-term impacts of nuclear waste disposal, which will affect thousands of future generations. No method is now available to dispose of nuclear wastes other than putting them in storage.

#### Request for Hearing

Because the operation of Plant Vogtle would have such a severe impact on the economy and environment of Georgia, Campaign for a Prosperous Georgia and Educational Campaign for a Prosperous Georgia hereby request that a public hearing be held on the DES to allow for greater public participation in the preparation of the final environment impact statement.

Respectfully submitted this, the fourth day of January, 1985,



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Tim Johnson  
Executive Director  
Campaign for a Prosperous Georgia  
and Educational Campaign for a  
Prosperous Georgia