



Educational Campaign for a Prosperous Georgia

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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

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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; he predicted a 1982 peak demand of 20,528 MW while the actual peak was 10,683 MW; and he predicted a 1983 peak demand of 22,728 MW while the actual peak demand was 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 epicentum, 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 Performance 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 1×10^7 rad and showed gradual drifting of readings after 1×10^4 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 Borselle 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 Borselle 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 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 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 rattleweed (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 c:

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.

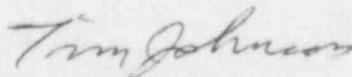
The DES assumes that alternatives to Plant Vogtle will be more expensive but offers no justification for this assumption beyond a generic rulemaking to that effect. Apparently, no effort was made to assess whether this holds true for Vogtle, even under the NRC's methodology, and consequently whether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



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