July 20, 1981

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	§	
	§	
HOUSTON LIGHTING & POWER COMPANY	§	Docket No. 50-466
	§	
(Allens Creek Nuclear Generating Station, Unit 1)	§	
	§	

DIRECT TESTIMONY OF GEORGE W. OPREA, JR.
AND JEROME H. GOLDBERG
ON TECHNICAL QUALIFICATIONS AND
TEXPIRG ADDITIONAL CONTENTION 31

Q. Please state your name and position.

A. My name is George W. Oprea, Jr. and I am Executive Vice President of Houston Lighting & Power Company (HL&P). My name is Jerome H. Goldberg, and I am Vice President, Nuclear Engineering and Construction, of HL&P.

Q. Mr. Oprea, would you please describe your professional experience and educational background.

A. I graduated from Rice University in 1952 with a Bachelor of Arts and a Bachelor of Science in Electrical Engineering. That same year, I joined HL&P in the Distribution Planning Section of the Engineering Department where I participated in computer applications engineering for system planning. In 1965, I was named superintendent of the Engineering Planning Division and two years later assumed

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responsibility as Project Manager, Energy Control Center. In 1970, I was promoted to Manager of the Energy Control and Dispatching Department. I was elected Vice President of Operations in 1971 and Group Vice President of Operations in 1973. I assumed my present position as Executive Vice President and member of the Board of Directors in 1974.

I am a Director of the Atomic Industrial Forum, a Director of the American Nuclear Energy Council, a member of the American Nuclear Society and I serve on the EEI Executive Advisory Committee on Nuclear Energy.

I am a registered Professional Engineer in the State of Texas.

Q. Mr. Goldberg, would you please describe your educational and professional background.

A. I received a Bachelor of Science degree in Marine Engineering from the U.S. Merchants Marine Academy in 1953 and a Master of Science degree in Nuclear Engineering from Massachusetts Institute of Technology in 1960.

I joined HL&P as Vice President, Nuclear Engineering and Construction in October 1980 where I have responsibility for engineering and construction of the South Texas Project (STP) and HL&P's planned Allens Creek facility.

From 1971 until October 1980 I was employed by Stone & Webster, where I began as a nuclear engineer and was

promoted to positions of increasing management responsibility up to the position of Vice President and Deputy Director of Construction. During the course of my employment with Stone & Webster, I also served as Project Engineer and Project Manager of the Beaver Valley I Nuclear Project and as Chief Engineer of the Engineering Mechanics Division.

Prior to joining Stone & Webster, I was employed from 1955 to 1971 at the Quincy, Massachusetts ship building yard in various positions involving engineering, design, construction and fueling of nuclear surface warships and submarines. I became the Nuclear Construction Manager and was responsible for all nuclear construction activities associated with four submarines built at the Quincy facility.

I served on active duty in the U.S. Navy from 1953 to 1955.

I am a member of the American Nuclear Society and a registered Professional Engineer in seven states: Massachusetts, New York, Pennsylvania, Rhode Island, California, Virginia and Texas.

Q. Gentlemen, what is the purpose of your testimony?

A. The purpose of this testimony is to address TexPirg Additional Contention 31, which alleges that HL&P is not technically qualified to construct Allens Creek because of construction problems at the South Texas Project nuclear plant.

Q. Mr. Oprea would you please describe the organization and management structure for overseeing the design and construction of the Allens Creek project.

A. The major organizations involved in the Allens Creek project are: Houston Lighting & Power Company, Ebasco Services, Incorporated, and the General Electric Company (GE).

As the applicant, HL&P has and retains the overall responsiblity for the engineering, design, procurement, fabrication, construction, fuel management, pre-operational testing, operation and quality assurance activities for Allens Creek. HL&P audits the activities of Ebasco, GE, consultants and other contractors to assure that their quality assurance programs are implemented.

Ebasco is the architect-engineer and is responsible to HL&P for design and engineering activities. Ebasco will also perform activities related to procurement, vendor surveillance, and construction management services as specified by HL&P.

The General Electric Company is the vendor for the nuclear steam supply system. GE performs design and engineering, procurement, fabrication, vendor surveillance, and quality assurance associated with the Nuclear Steam Supply System (NSSS).

To ensure the appropriate top-level corporate management involvement in the HL&P nuclear projects, my efforts as the Executive Vice President are devoted essentially 100% to our nuclear program. I report directly to the President of the Company. The nuclear responsibilities under my supervision include engineering, design, procurement, fabrication, construction, fuel management, pre-operational testing, operation and quality assurance. (See Attachment GWO-1)

Last year we created the new position of Vice President for Nuclear Engineering and Construction, and Mr. Goldberg was hired to fill that position. He is responsible for all nuclear engineering and construction activities, and the Manager for the Allens Creek Project reports directly to him. Mr. Goldberg, in turn, reports directly to me.

A new position, Vice President Nuclear Plant Operations, has recently been created. This position is held by Mr. Jerrold G. Dewease. Mr. Dewease, formerly Assistant Director of Nuclear Power with Tennessee Valley Authority, will have direct responsibility for all nuclear power plant operations, maintenance and related training. Mr. Dewease reports directly to me. The Plant Superintendent for Allens Creek will report to Mr. Dewease.

The Manager for Allens Creek is responsible for the overall management and coordination of project planning, scheduling, cost control, engineering, construction and start-up of the project. To accomplish this, he is supported by a project management organization.

The HL&P quality assurance organization is separate from the nuclear engineering and construction effort, and reports directly to me.

The basic HL&P organizational management structure and details of the scope of work and division of responsibilities can be found in the PSAR in Chapter 13 and Item II. J.3.1 of Appendix O. Quality assurance responsibilities are described in Chapter 17 of the PSAR and Item I.F.2 of Appendix O. I should note, however, that the PSAR does not reflect the addition of Mr. Dewease to our Staff.

Q. Mr. Oprea, would you please describe the technical resources directed by HL&P.

A. HL&P has an inhouse staff of engineers and managers to oversee the design and verify conformance with the applicable regulations, codes and other design criteria for the Allens Creek project. Sufficient manpower is maintained to meet current responsibilities of the project. Additionally, in some specific cases, temporary engineering support is assigned from line departments within the

Company, or consultants are contracted to work under the direction of HL&P personnel. In this regard we have an extensive corporate manpower pool to draw upon when necessary. We have approximately 250 employees in various disciplines including management, nuclear, civil and mechanical engineering, health physics and nuclear fuels.

Project staffing will increase commensurate with the project activities that are planned or underway. A planned HL&P project manpower schedule for Allens Creek is shown on page 0-183 of the PSAR.

Q. Mr. Goldberg, does HL&P maintain any technical training program?

A. Yes. In addition to hiring experienced individuals into the Company, HL&P maintains an active technical training program. All professionals have the opportunity and are expected to attend outside developmental courses or seminars each year. The line departments are responsible for training and hold technical workshops directed by in-house experts, Ebasco, GE and other vendor personnel. Typical workshops include studies of codes, components, BWR operation and design, quality assurance and procedural requirements.

The Health Physics Division has established a radiation training group, which is developing a number of

courses to teach HL&P personnel and contractors radiation protection, including the full range of technician training, general employee training, and operator training.

Q. Mr. Goldberg have you provided for the feedback of operating, design and construction experience into the Allens Creek project?

A. Yes. HL&P has developed an administrative procedure for the evaluation of operating, design and construction experience to assure that applicable industry experience is considered in the design of the Allens Creek project. Information from outside HL&P is directed to the Nuclear Licensing Department, which is responsible for distributing the information for those experiences which are of interest to Allens Creek. The Licensing Department categorizes these experiences and directs the information to the appropriate organization within HL&P for review and use. Experiences from within HL&P are also directed to the cognizant Allens Creek Project organizations This feedback program is described in further detail in Amendment 59 to the Allens Creek PSAR, Appendix O, in Item I.C.5.

Q. Mr. Goldberg, would you please describe the interaction between HL&P and its contractors for the design and construction of the Allens creek project?

A. HL&P provides overall design coordination utilizing

the Allens Creek project team. The team will follow documented procedures for each phase of the coordination process. HL&P oversight of contractor design activities is facilitated by the issuance of several status and performance reports which are directed to various levels of managment. In addition, copies of correspondence among contractors are sent to HL&P for information.

HL&P monitors and evaluates Ebasco performance by requiring Ebasco to obtain HL&P approval of the basic design criteria and selected design documents. In addition, HL&P purchases all engineered equipment based on Ebasco-generated and HL&P-approved specifications.

GE has the responsibility to provide the NSSS design. For those activities within GE's scope, HL&P monitors and evaluates GE performance by review of GE prepared system descriptions and other selected design documents. Ebasco also reviews these documents to ensure interface coordination between the NSSS and balance of plant.

The HL&P Project Construction Manager and his staff are responsible for construction overview of contractor performance. They monitor construction activities, approve schedules, field procurement, requisitioning and selected invoices. They impose other financial controls; assure compliance with permit and license requirements; assure

procedure compliance; assure coordination of Ebasco field engineering with Ebasco home office engineering staff; and coordinate contractor turnover of plant systems to nuclear operations.

Q. Mr. Oprea, would you please describe the executive management overview and involvement in the Allens Creek project.

A. I am the senior corporate officer in charge of HL&P's nuclear program. I keep Mr. Jordan, the President of the Company, informed on all our nuclear activities, including Allens Creek. I regularly report to the Company's Board of Directors on our nuclear projects. As Executive Vice President, I exercise executive management overview through regularly scheduled meetings and through written and verbal reports from the staff that is involved in our nuclear projects. I also get involved in decisions on significant matters that involve our nuclear projects, and I am called upon to set policy for future activities.

As Vice President for Nuclear Engineering and Construction, Mr. Goldberg authorizes all NRC licensing submittals, establishes the nuclear engineering and construction organizational structure and division of responsibilities therein, approves the filling of each staff position within the approved staffing compliment, and

participates in decisions involving engineering and construction activities. He holds periodic management review meetings on Allens Creek in which Ebasco and GE management representatives participate, thus enabling the management of all three companies to be regularly informed of the project status, management and technical issues and plans for the future.

The Allens Creek project organization provides monthly status reports to the Vice President for Nuclear Engineering and Construction, to other HL&P executives and to the principal contractor project managers. These reports identify project progress, problem areas, and planned activity over the next reporting period.

Q. Mr. Oprea, would you please summarize the quality assurance program for the Allens Creek project?

A. The Allens Creek QA program is structured to ensure that HL&P has the ultimate responsibility for quality assurance. HL&P retains overall responsibility for the engineering, design, procurement, fabrication, construction, pre-operational testing, operation and QA activities for Allens Creek. HL&P audits the activities of Ebasco, GE, consultants and other contractors to assure that their QA programs are adequate.

The QA program is independent of any responsibility

for performing the work to be verified. I have overall responsibility for the HL&P QA program and organization. The QA organization is completely separate from the organizations responsible for engineering, construction, and operation of Allens Creek. The QA organization and personnel are prohibited from performing design and construction work. The same holds true for Ebasco, where the QA program is independent of the construction and engineering organizations and QA personnel have no responsibility for performing the work which they must verify.

The QA program is based upon written procedures within HL&P, Ebasco, and GE. These written procedures cover every phase of design, procurement, installation, and construction of the project. Comprehensive verification, auditing, surveillance and inspection of HL&P and supplier activities are conducted by QA personnel to ensure that procedures and requirements are properly followed and correctly documented.

The QA program operates to ensure that management responsible for design and construction is fully informed of deficiences revealed by QA. Project procedures provide for notifying responsible individuals of nonconforming items and ensuring involvement of QA personnel in documenting satisfactory completion of corrective actions. In addition, trend analyses will be routinely performed to identify generic

problems which may develop, and management is informed of the results.

The QA program will be adequately staffed by using the project schedule to ensure that personnel are available and qualified to perform QA activities as they occur during construction, and to identify activities requiring special expertise as far in advance as possible. Staffing projections are periodically reviewed and revised as necessary. A training program ensures that QA personnel are properly qualified and certified to perform assigned QA duties.

Q. Mr. Oprea, does HL&P emphasize quality to HL&P personnel and contractor personnel working on the Allens Creek project?

A. Yes. HL&P management supports and emphasizes quality in all aspects of the Allens Creek project. Indeed, we impress upon the construction organization that it has the principal responsibility for doing quality work in this first instance. In addition, HL&P's Quality Assurance organization is responsible for indoctrinating personnel who have quality-related functions to impress upon them the necessity for work to be performed in accordance with specifications, codes, standards and regulatory requirements.

Q. Mr. Oprea, are there sections in the PSAR where these organizational and quality assurance matters are set out

in greater detail?

A. Yes. Chapter 13 of the PSAR describes the Organizational Structure of the Applicant; Chapter 17 describes Quality Assurance; and Appendix O, which responds to NUREG-0718 (Licensing Requirements for Pending Applications for Construction Permits and Manufacturing License), contains several relevant items--I.F.2, Develop More Detailed QA Criteria (p. 0-138); I.C.5, Procedures for Feedback of Operating, Design and Construction Experience (p. 0-127); and II.J.3.1, Organization and Staffing to Oversee Design and Construction (p. 0-170).

Q. Mr. Goldberg, TexPirg AC Contention 31a alleges that HL&P is not technically qualified to design and construct Allens Creek because HL&P has never designed an operating nuclear power plant with a record of safe operation. Would you please respond to this contention?

A. It is true that HL&P has never designed a nuclear plant. However, that is not relevant in considering HL&P's technical qualifications, since the plant is being designed by Ebasco and GE. Both of these organizations do have extensive experience in designing nuclear plants, and many of those plants are now operating. As is the case with most utilities, HL&P does not plan to design its nuclear plants. Rather, it is our responsibility to have a staff that can provide technical oversight of the activities

of our contractors.

Q. Mr. Goldberg, TexPirg AC Contention 31b alleges that HL&P is not technically qualified to design and construct Allens Creek because:

> In 1978, an internal study by the Applicant stated that HL&P had underestimated the amount of steel required for HL&P's South Texas Project by 122%, concrete by 63%, rebar by 125%, piping by 88%, wire and cables by 100%, terminations by 71%, cable trays by 116%, and conduit by 49%, at the time of application to build the South Texas Project in 1973. The report concluded that this underestimation was partially due to "development from the conceptual stage" which had occurred since the construction license proceedings there. This may indicate technical deficiencies in the Applicant's power plant construction planning.

Would you please respond to this contention?

A. The AE's 1973 estimate for STP was an early conceptual estimate based on plants that had been engineered and completed during the 1960's and/or engineered in the 1960's and were scheduled to be completed in the 1970's. This estimating process did not account for the rapid expansion in regulatory requirements which began in 1973. Moreover, the A/E underestimated the duration of construction. In contrast, the design of the Allens Creek project is not conceptual, the actual design is about 65% complete. The material and cost estimates are, therefore, much firmer. Moreover, the construction schedule on Allens Creek, which has been stretched for financial reasons, is unquestionably an achievable schedule.

Q. TexPirg Contention 31c alleges that HL&P is not technically qualified to design and construct Allens Creek because:

> NRC inspections indicate that the Applicant deviated in at least three instances from the PSAR submitted for its South Texas Project, all of which related to quality assurance, and this raises questions regarding the Applicant's ability to meet commitments in its ACNGS PSAR.

In an interrogatory answer dated November 19, 1979, TexPirg indicated that the three deviations related to: (1) PSAR paragraph 17.15A; (2) PSAR paragraph 3.8.1.2.1; and (3) an unspecified PSAR section dealing with audit design reviews. Mr. Goldberg, would you please comment on this contention?

A. As to the first allegation, it should be noted that there is no paragraph "17.15A" in the PSAR. This designation, however, was used by the NRC in I&E Report 79-08 (June 4, 1979) as a reference to PSAR paragraph 17.1.5A and I have assumed that the interrogatory answer referred to this I&E Report. This report did not question the adequacy of our construction or QA activities. The question here concerned the extent to which certain monitoring activities needed to be described in a subcontractor's procedures. The procedures in effect required Pittsburg-Des Moines Steel Company's QA department to monitor certain welding operations and to document the monitoring on a Fabrication Check List. The NRC believed that the procedure should have been more explicit

in describing the monitoring program. Although HL&P thought the procedure then in effect satisfied the PSAR requirement, we resolved the problem by issuing a new procedure.

As to the second allegation, paragraph 3.8.1.2.1 of the PSAR made certain requirements of the ACI-ASME's "Proposed Standard Code for Concrete Reactor Vessels and Containments" applicable to STP. During an early phase of the project, the NRC observed a concrete pour in which a QC inspector trainee was participating in the inspection with other inspectors. The use of a trainee in this situation was not allowed by the ACI-ASME Code and, thus, the NRC cited us for a "deviation" in I&E Report 77-06 (May 17, 1977). Once the situation was identified, our A/E agreed not to use trainees as inspectors, but rather to have them attend future placements for observation purposes only.

The issue concerning the activities of the Design Review Committee was raised in I&E Report 77-12 (December 9, 1977) and represented a question of interpretation concerning PSAR paragraph 17.1.1A.3.1.1. We simply amended the PSAR to clear up the question of interpretation.

HL&P acted promptly to correct these situations as they occurred and took recurrence control measures as appropriate. There is no indication that HL&P made commit-

ments in the PSAR which it ignored or sought to avoid. The instances of error in applying or interpreting procedures were made in good faith and do not reflect adversely on HL&P's technical competence.

Q. TexPirg Contention 31d alleges that HL&P is not technically qualified to design and construct Allens Creek because:

> HL&P has reported to the NRC that it failed to meet a commitment that a gantry crane at the South Texas Project meets tornado stress levels due to providing inadequate bid specifications to contractors, and this directly relates to the technical performance of the Applicant in this docket.

Mr. Goldberg, would you please respond to this contention?

A. This contention is correct insofar as it states that HL&P reported to the NRC that the effects of tornado wind loadings were not properly included for the essential cooling water gantry cranes. The discrepancy was caused by a failure on the part of the AE and was not a systematic problem that would reflect on HL&P's technical competence. On the contrary, upon discovery of the discrepancy it was reported promptly to NRC and corrective actions were taken.

In my opinion, the capability to find, report, and correct discrepancies is an attribute of technical competence.

Q. TexPirg Contention 31e alleges that HL&P is not technically qualified to design and construct Allens Creek because:

In a 1977 NRC inspection report at HL&P's South Texas Project (Rpt. #50-498-08), HL&P was informed six of the ten quality control inspectors stated that they had experienced harassment (including an individual report of a death threat), and despite this notice, at least four other instances of quality control inspector-reported harassment were noted in later NRC inspections; and on August 22, 1978 NRC report states that QC inspectors at South Texas Project agreed "in majority" that they were not receiving adequate technical assistance from Project Quality Assurance Licensee personnel.

Mr. Oprea, would you please respond to this contention?

A. It is important to point out that the 1977 inspection report clearly stated that the NRC had not found any programmatic harassment or intimidation of QC inspectors. The two incidents of harassment cited therein were shown to be the result of friction between the Brown & Root QC inspectors and Brown & Root construction personnel. The report notes that as a result of such friction the QC inspectors actually became more strict in their inspections.

The allegation regarding "technical support" cited in the August 22, 1978 report (I&E 78-12) was not substantiated by the NRC investigation and no items of non-compliance or deviations were cited by the NRC. Since the QC inspector's job is not an engineering or design function, it does not require "technical support" in any meaningful sense. Thus, we do not regard the allegation as valid.

Q. Were there other allegations of harassments investigated by the NRC?

A. Yes. For example, there were allegations of harassment in the NRC's Notice of Violation on April 30, 1980 and the associated Investigation Report No. 79-19. In answer to the Notice of Violation, HL&P stated it had no way to verify the NRC's allegations because the NRC did not disclose the identity of the persons involved nor the places and dates of such incidents. Nonetheless, HL&P took steps to eliminate any problems. For example, the A/E revised its QC salary administration; upgraded the QC supervisory positions: emphasized that project procedures, specifications and drawings were to be rigorously followed; required management personnel to make more frequent visits to the site; reemphasized its "open door" policy to top corporate management; made more efficient the communication chain between site QC personnel and top QA management; emphasized the role of QC supervision; initiated "QA Bulletins" to provide better understanding of overall activities within the QA departments; instituted regular refresher training of A/E construction and QA/QC personnel in project procedures; and increased the size of the QA/QC staff.

The NRC has issued a followup report (I&E 80-25) and found that the problem had been corrected, that no recurrent trends were evident, and that the matter was considered closed. In sum, we do not think these matters have any bearing on a plant that is to be constructed by Ebasco, but if we ever

encourter the problem again we know how to take steps to correct it.

Q. TexPirg Contention 31f alleges that HL&P is not technically qualified to design and construct the Allens Creek project because:

> On September 15, 1978, the NRC reported an investigation of an incident in which a quality control inspector alleged that HL&P's contractor at the South Texas Project fired him for strict inspection behavior, while the contractor's employee alleged a conversation with the quality control inspector in which the inspector allegedly solicited a bribe and supposedly stated that HL&P would "stay out" of any quality control let-downs; and though intervenor does not know what in fact occurred in this incident, the matter is sufficiently serious to form the basis for the consideration of this contention in this docket;

Mr. Oprea, would you please respond to this contention?

A. This appears to be a reference to a series of events that led to the A/E firing a QC inspector in August, 1978. The management of the A/E was faced with a difficult problem in this situation. A trusted, long-term construction employee alleged that the QC inspector solicited a bribe in return for the QC inspector's "going easy" on the construction man's concrete pours. The construction man was cooperative in the investigation and gave a sworn statement about the event. While the QC inspector denied the allegation, he refused to give a sworn statement and was generally evasive in answering questions. Given this situation, the A/E decided that they had to release the QC inspector. HL&P was not involved in

the decision, but was kept informed of the progress of the investigation, and the results thereof. HL&P concurred with the A/E's decision in this matter.

In my opinion, this has no bearing on the technical qualifications of HL&P for the Allens Creek project.

Q. TexPirg Contention 31g alleges that HL&P is not technically qualified to design and construct Allens Creek because:

> HL&P is the Project Manager of South Texas Project and is ultimately responsible to the NRC for the 24 items of non-compliance reported in inspections there so far, and for the numerous construction problems such as building the mechanical auxillary building one foot too narrow and installing under-strength bolts, and that such performance as project manager there raises questions as to the technical qualifications of Applicant.

TexPirg's answers to HL&P's Fourth Set of Interrogatories state that the "24 items of non-compliance" were listed in an exhibit in HL&P's rate case in PUC Docket No. 2676.

Mr. Oprea, would you please respond to this contention?

A. Although systems are designed, procedures are written and personnel are trained with the goal of having no items of non-compliance, we must use people to build these plants and people make mistakes. I am not aware of any plant which has been built with no items of non-compliance resulting from NRC inspections. As the items are identified, corrective actions are taken and recurrence control is addressed as

appropriate. As to the items identified in the exhibit in the rate case, the NRC has determined that HL&P's resolution of these items was satisfactory and has closed out these items.

Items of non-compliance generally evidence the failure of specific individuals to understand or follow procedures and, thus, are not at all indicative of technical competence. The one foot short building at STP, for example, resulted from a survey error by an A/E survey crew working in the field. Errors of this sort are not a reflection on the technical competence of HL&P and could not be prevented unless HL&P attempted to duplicate every function of the architect-engineer/constructor.

Wherever an item of non-compliance has indicated a shortcoming in the management systems used on the project, such as a failure to trend non-conformances, we have attempted to strengthen the system. The lessons learned in this process are being used in designing the management systems for ACNGS in order to minimize such occurrences.

Q. Mr. Oprea, in your opinion do the inspection reports referred to in the contention have a bearing on HL&P's technical competence to design and construct Allens Creek?

A. Yes, but it is not a negative influence. First of all, we do not regard these reports as especially unique. All nuclear plants have a variety of such reports during the period of construction. What is significant is the ability

to make corrections, to learn from the experience, and to minimize future occurrences.

In regard to HL&P, the STP experience has been a positive contribution to our technical competence. We have become aware of the need for strong management involvement in our nuclear projects and have taken steps to accomplish this. In my opinion, the measures discussed in this testimony regarding management for design and construction and the quality assurance program, and detailed in Chapters 13 and 17 and Appendix O of the PSAR, reflect that HL&P has the technical competence to undertake the Allens Creek project.

Q. Mr. Goldberg, would you please describe the technical competence of the General Electric Company to design a nuclear steam supply system for the Allens Creek project?

A. The General Electric Company is one of the major designers and fabricators in this country of nuclear reactors and nuclear fuel. It has been in the nuclear business since 1955 and presently has over 80 reactors either complete, under construction, or on order. Twenty-four of these reactors are BWR/6 design with Mark III Containments. Of these twenty-four, Grand Gulf 1 & 2, River Bend 1 & 2, Perry 1 & 2, Hartsville A-1, A-2, B-1, B-2, Phipps Bend 1 & 2, Clinton 1 & 2, Skagit 1 & 2, and Black Fox 1 & 2 are being and/or are schedule to be constructed domestically. Each of these has also received or is pursuing a construction permit based on

the same basic design Allens Creek utilizes.

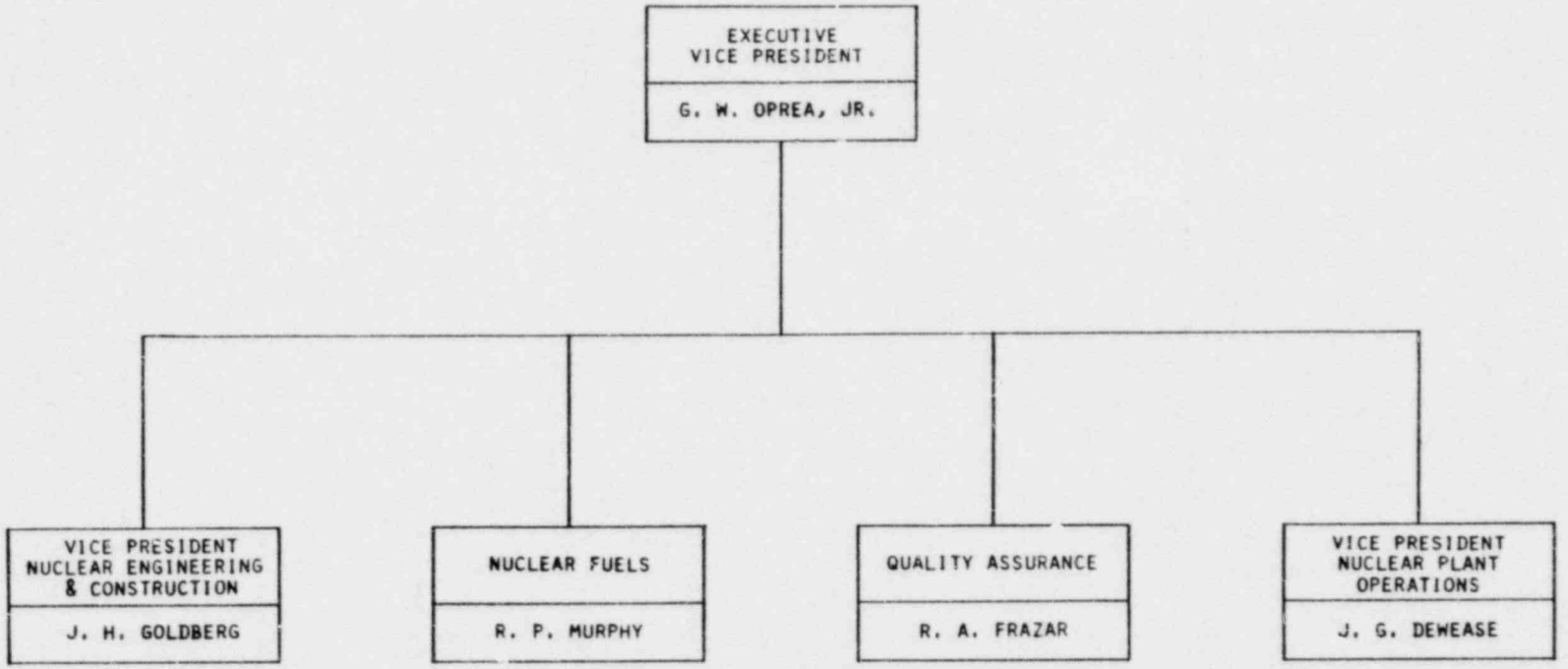
Of the domestic BWR/6's Grand Gulf 1 is expected to startup early 1982, Clinton 1 and Perry 1 in 1983 and River Bend in 1984. Also, the Kuo Sheng 1 reactor, a BWR/6 Mark III in Taiwan, is in the startup phase and has commercially produced electricity at 35% of full power.

GE has extensive research and development facilities which are used in the design of the BWR. These facilities are both full scale and scaled down models and cover such topics as core thermal hydraulics, mechanical testing of BWR material, performance characteristics of various BWR components, blowdown loads on containment, and servicing and maintenance of the BWR. Thus, GE has extensive experience, knowledge and capability to design and fabricate the BWR.

Q. Mr. Goldberg, would you please describe the technical qualifications of Ebasco to serve as the architect engineer for the Allens Creek plant?

A. Ebasco is responsible for design engineering, construction, equipment procurement and startup of the balance of plant facilities. This includes all plant structures, systems and components other than those provided by the NSSS supplier. Ebasco has provided engineering, construction and consulting services to utilities in the United States and throughout the world for 70 years. In the past 18 years, Ebasco has been the architect-engineer (AE) on 25 nuclear

projects; fourteen of which are General Electric BWR's. Of these fourteen plants 12 are operating successfully. Currently, Ebasco maintains a permanent force of approximately 4,000 personnel to carry out services related to power generation, transmission and distribution. Approximately 1000 of these employees are specifically identified with nuclear activities. Thus, Ebasco Services has substantial experience in the design and construction of BWR nuclear plants.



CORPORATE

NUCLEAR ORGANIZATION