UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

NRC STAFF TESTIMONY OF FREDERICK R. ALLENSPACH AND JOHN W. GILRAY RELATIVE TO TECHNICAL QUALIFICATIONS

[TEXPIRG AC 31]

Q. Will you please state your full name, job title, and specifically, your responsibilities relative to the Allens Creek Nuclear Generating Station (ACNGS).

A. My name is Frederick R. Allenspach and I am a Management Engineer in the Licensee Qualifications Branch, Division of Human Factors Safety, Office of Reactor Regulations, Nuclear Regulatory Commission. In that capacity, I reviewed the proposed managerial organization of HL&P relative to the Allens Creek Nuclear Generating Station.

My name is John W. Gilray and I am a Principal Quality Assurance Engineer (Nuclear) in the Quality Assurance Branch. In that capacity I have reviewed the quality assurance (QA) program for the construction of ACNGS.

Q. Have you prepared a statement of your educational and professional qualifications?

A. Yes.

Q. Are the statements attached to this testimony?

A. Yes.

Q. What is the purpose of this testimony?

A. The purpose of this testimony is to respond to TEXPIRG AC 31 which basically alleges that, based on experiences at the South Texas Project (STP), the Applicant is not technically qualified to design and construct ACNGS. This testimony is divided into two distinct parts. First, the testimony sponsored by Mr. Allenspach will describe the Applicant's (HL&P) current plans for its management and organizational structure to carry out the design and construction of ACNGS.

Secondly, the testimony sponsored by Mr. Gilray will describe and assess the QA organizations and programs developed by HL&P, EBASCO and GE to be implemented to ensure proper engineering and construction activities consistent with established requirements and criteria.

Q. Mr. Allenspach, did you review and assess the Applicant's management and organizational structure as part of the Staff's safety evaluation?

A. Yes. This review and assessment was specifically developed as input to the Staff's Safety Evaluation Report (SER) Related to the Construction of Allens Creek Nuclear Generating Station, Unit 1, Supplement No. 3, NUREG-0515 (July 1981). It is based on the information submitted in Section 13.1 of the Applicant's PSAR through Amendment 59 and supplemental information submitted in response to Item II.J.3.1 of NUREG-0718, "Licensing Requirements for Pending Applications for Construction Permits and Manufacturing License," (March 1981). It is

also based on discussions with several key members of HL&P. Accordingly, my substantive testimony will incorporate my review of this subject matter as set forth in the SER, NUREG-0515, Supp. No. 3, Part II.J.3.1. That SER input is attached to this testimony and constitutes part of my substantive testimony.

Q. Is this the same management and organizational structure of the Applicant that existed prior to its experiences at STP?

A. No. Subsequent to the problems at STP, HL&P implemented a major reorganization to provide better management control of its nuclear projects. Specifically, HL&P changed its organization to establish a senior corporate officer, an Executive Vice President, in charge of the nuclear program. He is responsible for all nuclear activities within HL&P related to design, engineering, construction, nuclear fuel, operation and quality assurance and he reports directly to the President and Chief Executive of HL&P. Prior to this organization change, this particular senior corporate officer was responsible for both nuclear and fossil projects. The current Executive Vice President - Nuclear Project is presently devoting his attention almost exclusively to nuclear matters pertaining to the design and construction of both STP and ACNGS. Within the new organization, HL&P has established the Vice President Nuclear Engineering and Construction which it has filled with an individual with over 10 years of experience in this field. The Staff believes that this organizational change does provide better management control over HL&P's nuclear projects.

Q. Is there an HL&P Allens Creek project group separate and distinct from the HL&P STP project group?

A. Yes. As can be seen from the attached organizational charts, the organization reporting to the Vice President Nuclear Engineering and Construction consists of the Manager South Texas Project, Manager Allens Creek, Manager Nuclear Services, and Manager Nuclear Licensing. The Manager Allens Creek has responsibility for the design, procurement, and construction at ACNGS. Thus, control of the architect/engineer (AE) and the designer and fabricator of the nuclear steam supply system (NSSS) at ACNGS is totally separated at the project level from these activities at STP.

Q. Mr. Gilray, are you aware of any other significant action HL&P has taken to strengthen its management capability subsequent to the STP problems with respect to QA programs?

A. Yes. The overall QA programs of HL&P have been revised to include improved controls and procedures to provide a more effective management system in carrying out the program. These controls include (a) increasing the QA and QC organizations' responsibilities and authority in day-to-day site activities and in stop work actions; (b) increasing the training and qualification programs for site personnel; (c) modifying the system for identifying nonconformances and initiating and verifying corrective actions to assure timely and effective control of deficiencies; (d) establishing a trend analysis program for systematic review of nonconformances, corrective actions, audit deficiency reports, engineering design deficiencies, and vendor nonconformances to determine where investigative and corrective actions are necessary; (e) improving the field design change program by increasing and assigning an increased qualified engineering staff at the site for the timely analysis and independent

review and verification of design changes; (f) increasing as-built control of the design change activity at the site; and (g) revising the audit programs by increasing the auditing skills of the audit staff and by enhancing the audit activity in the review of records and direct observations of work being performed to assure procedural adherence and compliance with the QA program. In addition, the criteria established in NUREG-0718 as a result of the review of the accident at TMI-2, have been met by HL&P's, EBASCO's, and GE's QA organizations and programs. In particular, these QA programs have been established based on consideration of: (a) ensuring independence of the organization performing checking functions from the organization responsible for performing the functions; (b) performing quality assurance/quality control functions at construction sites to the maximum feasible extent; (c) including QA personnel in the documented review of and concurrence in quality related procedures associated with design, construction and installation; (d) establishing criteria for determining QA programmatic requirements; (e) establishing qualification requirements for QA and QC personnel; (f) sizing the QA staff commensurate with its duties and responsibilities; (g) establishing procedures for maintenance of "as-built" documentation; and (h) providing a QA role in design and analysis activities.

Q. Has the Staff reviewed the QA programs of HL&P, EBASCO and GE?

A. Yes. These QA programs and our review of them are set forth in detail in the attached SER input to NUREG-0515, Supplement No. 3 in response to Item I.F.2 of NUREG-0718.

Q. What is the Staff's conclusion regarding these QA programs?

A. The Staff finds that these QA programs and organizational arrangements of HL&P, EBASCO and GE will enable HL&P to conduct an effective QA program at both the site and the corporate level for the Allens Creek Project. We believe that the effective implementation of these QA programs will provide the necessary assurance that QA/QC criteria and requirements will be met.

Q. In either of your opinions, does the fact that HL&P has never designed and constructed an operating nuclear power plant, alter your conclusions that the Applicant is technically qualified to design and construct the proposed facility?

A. No.

II.J.3.1 ORGANIZATION AND STAFFING TO OVERSEE DESIGN AND CONSTRUCTION

Position

Applicants shall describe their program for the management oversight of design and construction activities. Specific items to be addressed include: (1) the organizational and management structure which is singularly responsible for the direction of the design and construction of the proposed plant, (2) technical resources which are directed by the utility organization, (3) details of the interaction of design and construction within the utility organization and the manner by which the utility will assure close integration of the Architect-Engineer and nuclear steam supply system vendor, (4) proposed procedures for handling the transition to operation, and (5) the degree of top level management oversight and technical control to be exercised by the utility during design and construction, including the preparation and implementation of procedures necessary to guide the effort.

Draft NUREG-0731, "Guidelines for Utility Management Structure and Technical Resources,"[31] is the keystone for similar development of guidelines for this task. Therefore, the principal applicable elements of NUREG-0731 shall be used by CP and ML applicants in addressing this task.

Applicants shall submit detailed information in order to provide reasonable assurance that the requirements will be implemented properly prior to issuance of the construction permits or manufacturing license.

Discussion

The applicant should establish an organizational structure which will be singularly responsible for the overall management and technical support for the project. Key characteristics of such an organization should be:

(1) Integration of all necessary responsibilities under a single responsible upper executive position.

(2) The individual in charge of all nuclear functions should be a senior level executive in the corporation.

(3) The lines of authority to the upper level executive position should be clear and communications channels delineated.

The organization under the upper level executive should have the following duties and responsibilities for the project:

(1) Review and approval of the design criteria of the nuclear steam supply system vendor and architect-engineer.

(2) Review and approval of principal plant design features.

(3) Review and approval of safety analysis reports.

(4) Coordination of licensing activities with the NRC.

(5) Review and audit of principal contractors' job management.

(6) Development and implementation of a quality assurance program covering utility and contractors, including engineering design review.

(7) Feedback of operatic maintenance, and inspection experience from industry.

The applicant has the responsibility for the overall design, construction, and operation of the Allens Creek Nuclear Generating Station. HL&P has established an integrated organization under the Executive Vice President, Nuclear Project to implement this responsibility. The Executive Vice President, Nuclear Project, reports to the President of HL&P. The organization reporting to the Executive Vice President, Nuclear Project, is shown in Figure 4.

The organization reporting to the Executive Vice President, Nuclear Project, consists of the Manager, Quality Assurance; Vice President, Nuclear Engineering and Construction; Vice President, Nuclear Operations; and Director, Nuclear Fuels.

The Manager, Quality Assurance, has the responsibility for the quality assurance program. The Vice President, Nuclear Operations, will have the responsibility for operating and maintaining Allens Creek and the South Texas Project after the operating license is issued. The Director, Nuclear Fuels, will have the responsibility for delivering and utilizing nuclear fuel.

As shown in Figure 4, the organization reporting to the Vice President, Nuclear Engineering and Construction, consists of the Manager, South Texas Project; the Manager, Allens Creek; the Manager, Nuclear Services; and the Manager, Nuclear Licensing. The Manager, Allens Creek, has the responsibility for Allens Creek design, procurement, and construction. The Manager, Nuclear Services provides engineering support for nuclear engineering and for corporate health physics. The Manager, Nuclear Licensing, is responsible for providing licensing support to the Allens Creek Manager. Other departments within HL&P, such as the Power Plant Engineering and Systems Engineering, provide engineering support to the Allens Creek Project Engineering Manager.

The current total staffing level for the Allens Creek project engineering, quality assurance and operations organizations is about 32 individuals. HL&P projects increasing this number at the start of construction at about 56, including construction management individuals, and peaking at about 312 as the operations group builds up when the unit is nearly complete. In addition, a wide range of technical expertise exists within the corporate organization

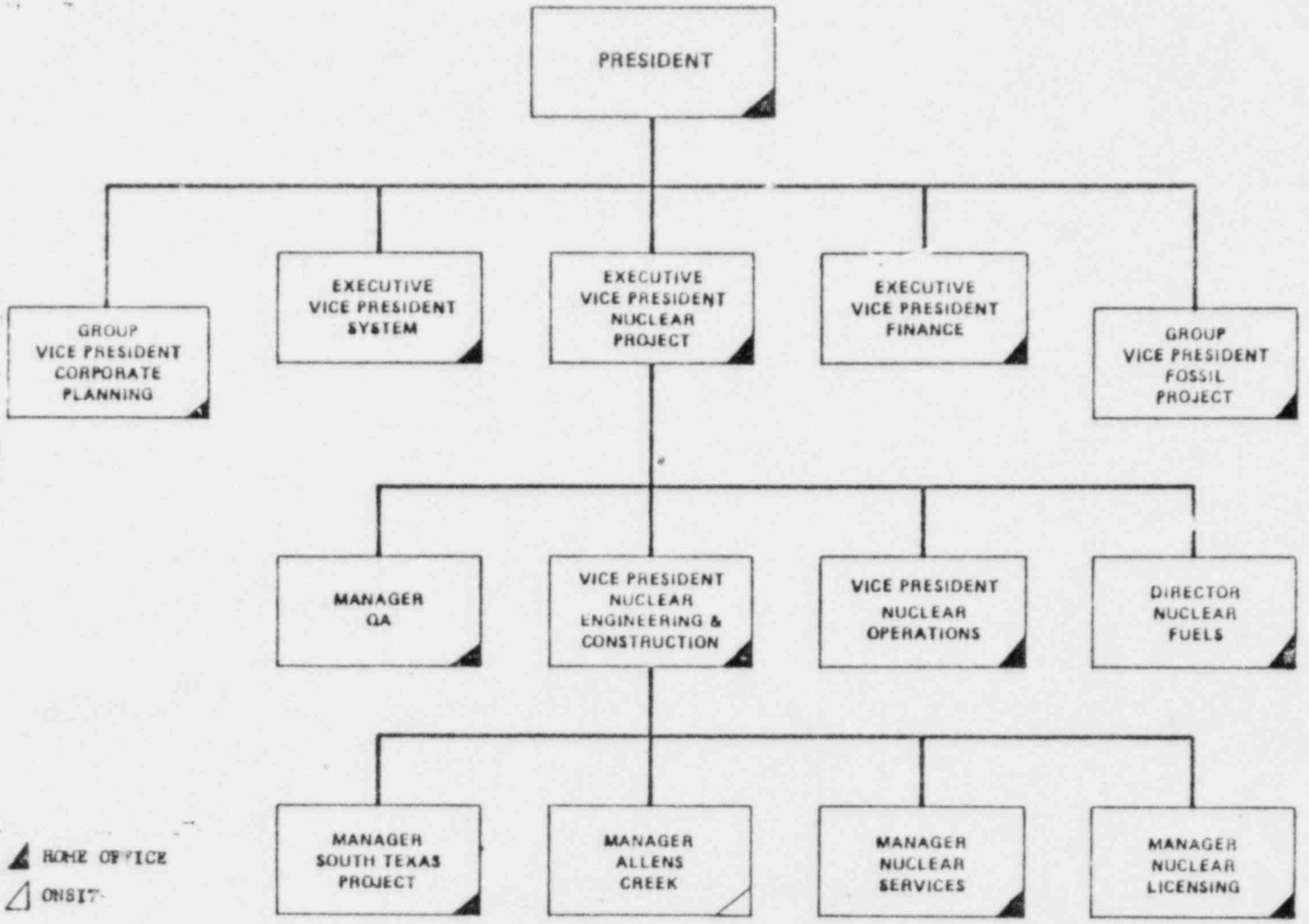

Figure 4 Allens Creek Nuclear Generating Station: Organization chart

covering all the major engineering disciplines, plus some of the more highly specialized fields. If a technical issue should arise that is beyond the scope of HL&P's engineering capabilities, the applicant has the option of obtaining services of outside experts to assist in resolving the issue.

Ebasco was selected to perform the architect-engineer services and construction management services. The applicant monitors and evaluates Ebasco's performance of these services by requiring Ebasco to obtain HL&P approval of the basic design criteria and selected design documents. Further, the applicant places the purchase orders for all equipment based on Ebasco-generated and HL&P-approved specifications. GE is responsible to HL&P for the design and fabrication of the nuclear steam supply system, including the preparation of design documents and procurement of related hardware. GE prepares system descriptions and other selected design documents for both HL&P and Ebasco. HL&P monitors and evaluates GE performance by review of these documents. Ebasco reviews these documents to ensure interface coordination between the nuclear steam supply system design and the Ebasco-designed plant features, subject to the applicant's quality assurance surveillance. GE prepares interface criteria; safety analyses; other design information; test procedures, maintenance and operating procedures; and technical support for the nuclear steam supply system installation. All correspondence among HL&P, Ebasco, and GE which affects the design interface is processed by each of the parties according to internal procedures. Periodic audits between Ebasco and GE are held to provide assurance that design interfaces are met. HL&P participates in these audits.

Within HL&P, the Manager, Allens Creek has full authority to implement action to achieve project goals, and all contractors and HL&P team members, except Quality Assurance, are under his direction. The Allens Creek Project Organization, as shown in Figure 5, is made up of individuals assigned to the project from the several line or functional departments. The organization consists of a manager and a support team of engineers and other professionals whose only function is to manage the design, licensing, procurement, construction, and startup of Allens Creek. The Manager, Allens Creek reports to the Vice President, Nuclear Engineering & Construction. The individuals assigned to the project bring with them the necessary authorities and responsibilities to act on behalf of the departments they represent. This allows the project organization to function as a coherent unit, with decisions being made at the appropriate levels.

The transition from the design and construction phase to the operational phase will be facilitated by the organizational arrangement under the Executive Vice President, Nuclear Project. The Nuclear Operations group has had full time individuals assigned to the Project Engineering team since design began to ensure that operational aspects are factored into the plant. HL&P intends to furnish the operating staff with ample lead time for them to learn the plant design and operation. The Nuclear Operations group will be deeply involved in the preoperational, hot functional, and startup testing.

The Nuclear Services organization responsible for reviewing and approving plant design will continue as the technically cognizant expert resource when Allens Creek operates, performing the same functions of engineering support as it does now for the South Texas Project. Since the HL&P Project Engineering Organization will be physically located at the site during construction and

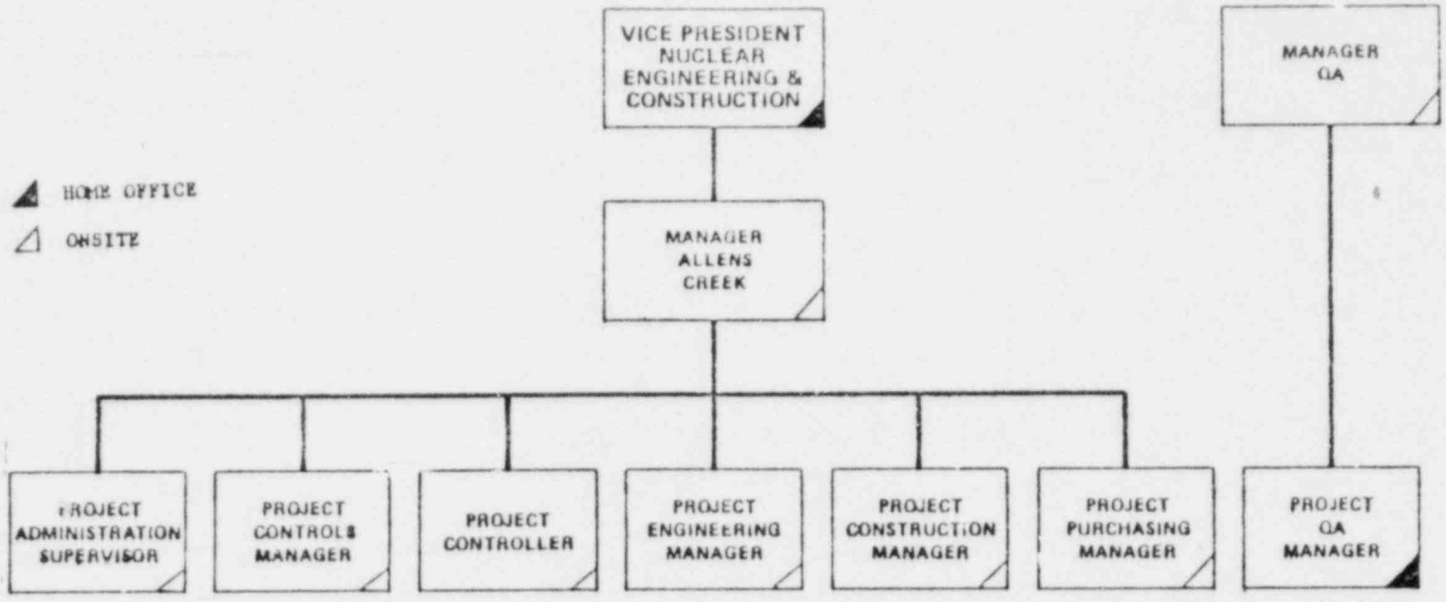

Figure 5 Allens Creek Nuclear Generating Station: Project organization

startup, the individuals in that organization will have excellent familiarity with the equipment. These individuals will be a basic resource for actual transfer to the operations or engineering support groups.

The staff has reviewed the applicant's organization with respect to its structure, technical resources available to work on the Allens Creek Project, qualifications of key personnel in the nuclear organization, and the planned involvement of the management in the design and construction of the Allens Creek plant, as described in Amendments 57 and 59 to the Allens Creek PSAR. To get a better understanding of how the organization functions and to gain a feeling for the responsibilities and attitudes of the individuals, several members of the staff met with key individuals of HL&P in Bethesda, Maryland, on May 21, 1981. These individuals were the Vice President, Engineering and Construction; the Manager, Quality Assurance; the Manager, Allens Creek; and the Manager, Nuclear Licensing.

Conclusions

On the basis of NRC review of the applicant's organizational structure, the qualifications of key personnel, its technical resources, and the degree of top level management oversight and technical control, the staff concludes that [illegible]ization and staffing meet requirements of Item II.J.3.1 and that [illegible]e resources and management capability to oversee the design and construction of the facility.

II.K.1.22 DESCRIBE AUTOMATIC AND MANUAL ACTIONS FOR PROPER FUNCTIONING OF AUXILIARY HEAT REMOVAL SYSTEMS WHEN FEEDWATER SYSTEM NOT OPERABLE

Position

Applicants with BWR plants shall design auxiliary heat removal systems such that necessary automatic and manual actions can be taken to ensure proper functioning when the main feedwater system is not operable. A general explanation of how this requirement will be met is required prior to issuance of the construction permits. Sufficient detail shall be presented to provide reasonable assurance that the requirements will be implemented properly.

Discussion

The applicant states, in the PSAR, that the plant design requires no immediate manual action to mitigate the consequences of a loss-of-feedwater (LOFW) event. In order to support this assertion, the applicant discusses the operating sequence and possible operator actions for three events in which an LOFW occurs:

(1) LOFW,

(2) LOFW and stuck-open relief valve (SORV),

(3) LOFW with HPCS/RCIC inoperable (HPCS--high pressure core spray; RCIC--reactor core isolation cooling)

In all these cases, the water level in the reactor vessel drops to the alarm point (level 4--approximately 200 inches above the top of the active fuel (TAF)), then to the point at which reactor scram occurs automatically (level 3--approximately 180 inches above TAF), and then to the level at which both the HPCS and RCIC systems would be activated and the recirculation pumps are tripped (level approximately 2 to 120 inches above TAF). All of these actions occur in about 20 seconds.

In cases 1 and 2 (with RCIC and HPCS available), the level continues to fall to a minimum of about 80 inches above TAF before the RCIC and HPCS systems start to pump water into the reactor, raising the water level to the point at which the HPCS and RCIC systems shut off automatically (the HPCS continues to operate on "bypass"--no water injected into reactor vessel--and will react automatically to a low level (level 2) initiation signal unless previously shut off by the operator.)

The injection of cool water by the RCIC and HPCS systems will cause a pressure reduction in the reactor vessel which will result in a low pressure isolation signal.

After the HPCS and RCIC systems stop injecting water into the reactor vessel, the system pressure rises to the set point at which the lowest set relief valve opens to prevent overpressurization of the primary system (this is the end of the applicant's narrative for case 1).

In case 2, it is assumed that the relief valve opens and sticks in the open position, causing the system to depressurize to the point at which the shutdown cooling system may be put into operation (end of narrative for case 2).

The applicant, for case 3, notes that the water level continues to drop from level 2 to level 1 (approximately 40 inches above TAF)--at which level the low pressure ECCS systems, low pressure core spray and low pressure coolant injection systems start. However, manual (operator) action would be required to depressurize the primary system by means of relief valves or the automatic depressurization system to permit use of the low pressure ECCS systems. For the case 3 event, the applicant assumes that the operator will start to depressurize the primary system when the water level in the reactor vessel drops to level 1.

The applicant has agreed to provide procedures for the use by the operators to mitigate loss-of-feedwater events and to provide a summary of these procedures in the FSAR.

Conclusions

The staff finds the information and commitments provided by the applicant to conform with the information requirements of Item II.K.1.22 and concludes, therefore, that the applicant's response is acceptable.

I.F.2 DEVELOP MORE DETAILED QUALITY ASSURANCE CRITERIA

Position

Applicants shall describe the changes to their QA programs that have resulted from their review of the accident at TMI-2. In addition, applicants shall address the appropriate matters discussed in this Action Plan item, including the establishment of a quality assurance (QA) program based on consideration of: (a) ensuring independence of the organization performing checking functions from the organization responsible for performing the functions; (b) performing quality assurance/quality control functions at construction sites to the maximum feasible extent; (c) including QA personnel in the documented review of and concurrence in quality related procedures associated with design, construction and installation; (d) establishing criteria for determining QA

programmatic requirements; (e) establishing qualification requirements for QA and QC personnel; (f) sizing the QA staff commensurate with its duties and responsibilities; (g) establishing procedures for maintenance of "as-built" documentation; and (h) providing a QA role in design and analysis activities. Applicants shall submit, prior to the issuance of the construction permits or manufacturing license, a revised description of their QA program that includes consideration of these matters.

Discussion

(a) The Houston Lighting & Power Company, Ebasco Services Incorporated and the General Electric Company organizations are shown in Figures 1, 2, and 3, respectively. HL&P has established a Project Quality Assurance Group to direct and manage the overall site quality assurance program. The group oversees the various disciplines (mechanical, civil, and electrical), procurement, and quality systems to determine the QA program requirements and to ensure adequate implementation of HL&P's, Ebasco's, and GE's quality assurance programs. The HL&P, Ebasco, and General Electric QA organizations are on an equal organizational level as those line managers responsible for engineering, procurement, and construction. Ebasco's and GE's quality assurance programs provide organizational arrangements whereby the quality assurance and quality control orgarizations have the authority and responsibility for inspection and verification functions. With regard to onsite construction activities, the Ebasco quality control engineers are responsible for the inspection and verification functions to ensure conformance to design, specification, and QA program requirements. This arrangement provides the necessary independence from cost and schedule and from the organizations having direct responsibility for the work being inspected and verified.

(b) The HL&P Project Quality Assurance Manager (see Figure 1) will be located at the construction site and will be responsible for directing and managing the site quality assurance program and quality-related site activities. These include programmatic direction and administration of the policies, goals, objectives, and methods as described in the Project Quality Assurance Plan. Programmatic direction includes establishing the QA program requirements and ensuring the adequacy of the quality assurance program for HL&P and its prime contractors. The Project Quality Assurance Manager reports to the offsite Manager, Quality Assurance, who reports to the Executive Vice President. The Project Quality Assurance Manager and his staff have appropriate organizational position responsibilities and authority to exercise proper control over site quality activities. They are free from non-quality assurance duties and can thus be dedicated to ensuring that the site quality assurance program is being effectively implemented.

Ebasco's Quality Program Site Manager (see Figure 2) reports to Ebasco's offsite Chief Ouality Assurance Engineer. The Quality Program Site Manager and his staff's responsibilities include: reviewing and auditing quality-related site construction engineering activities; reviewing site-generated purchase orders for inclusion of quality assurance requirements; planning and performing site construction inspection activities; identifying and initiating correction of nonconforming conditions; establishing and enforcing quality control documentation and inspection requirements; performing or monitoring of site nondestructive examination,

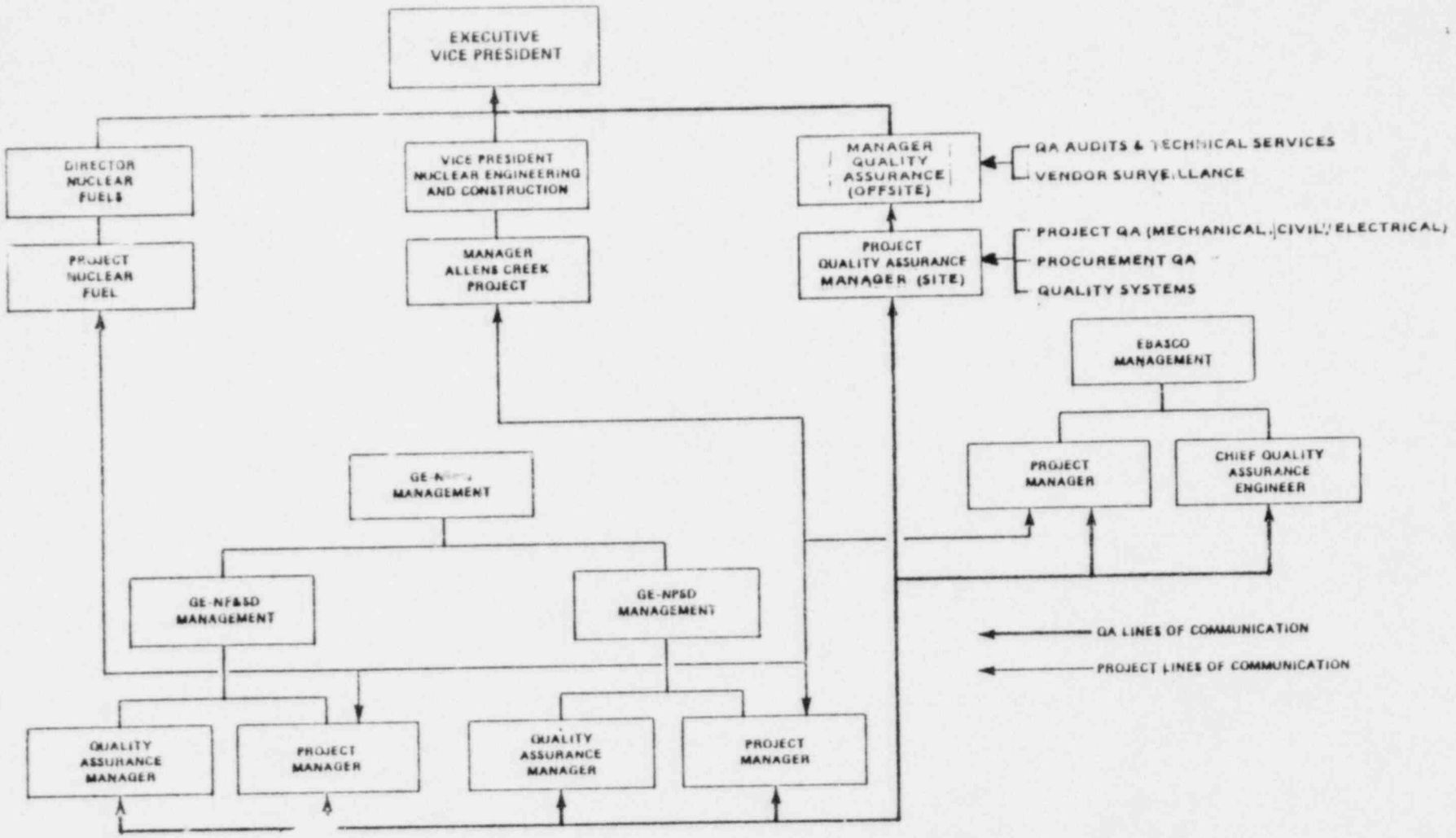

Figure I Houston Lighting & Power Company, Allens Creek Nuclear Generating Station, Unit I: External QA relationships

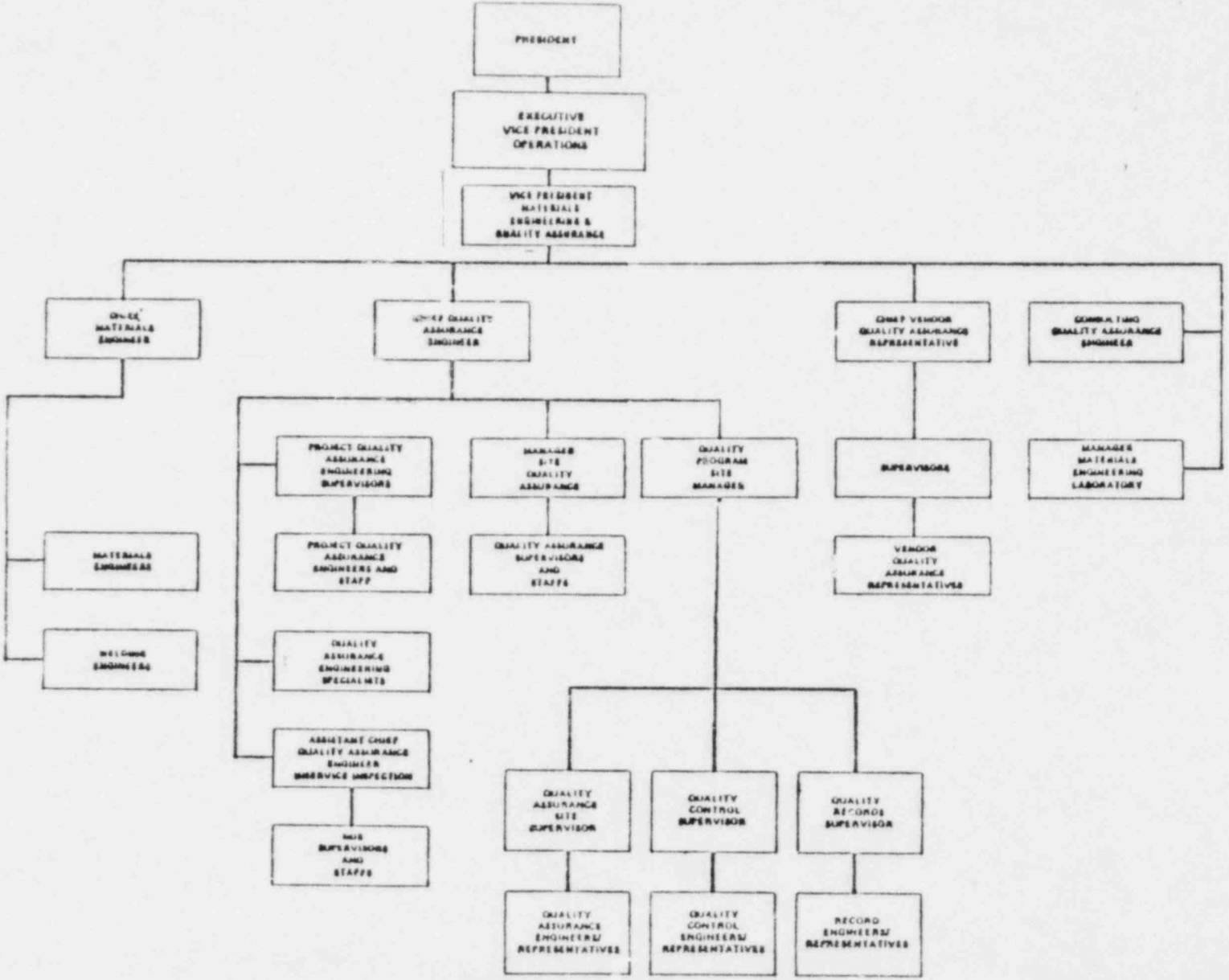

Figure 2 Ebasco Services Incorporated: Materials engineering and QA organization

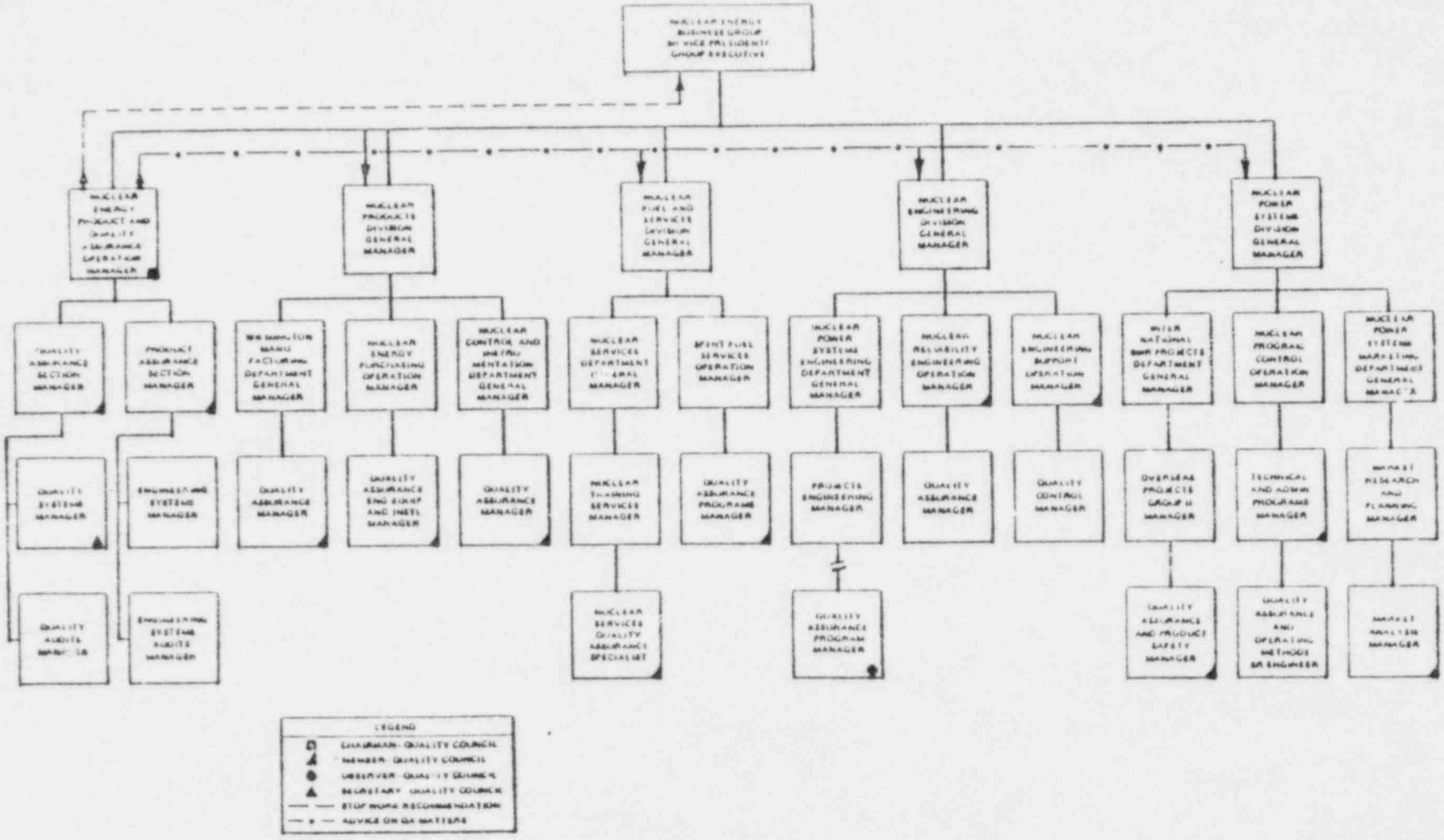

Figure 3 General Electric Company: Abridged organization chart showing key QA positions and relationships in the Nuclear Engineering Business Group BWR Business

soils, and concrete testing activities; identifying and controlling the quality status of items; developing, establishing, and implementing a system for collection, storage, and maintenance of quality assurance records at the site; evaluating of the suppliers' quality assurance programs; and qualifying and certifying personnel as required by applicable codes and standards.

The HL&P Project Quality Assurance staff will be involved in day-to-day plant activities important to safety; that is, the quality assurance organization will routinely attend and participate in daily plant work schedule and status meetings to ensure that they are kept abreast of day-to-day work assignments throughout the plant and that there is adequate quality assurance coverage relative to procedural and inspection controls, acceptance criteria, and quality assurance staffing and qualifications of personnel to carry out quality assurance assignments.

Both HL&P's and Ebasco's onsite QA and QC organizations will report offsite and will sufficiently free from non-quality assurance duties to ensure that the quality assurance program at the plant site is being effectively implemented.

(c) Provisions will be established by HL&P to ensure that quality-related procedures necessary to implement the quality assurance program are properly documented and consistent with the mandates contained in the PSAR. The corporate Nuclear Quality Assurance Program Manual requires the establishment of the Project Quality Assurance Plan for the design and construction phase of the project. The Project Quality Assurance Plan requires the establishment of implementing procedures to comply with each of the 18 criteria of 10 CFR Part 50, Appendix B, and also requires Ebasco to submit all procedures which control quality activities to HL&P Project Quality Assurance for review. The Executive Vice President reviews and approves the Project Quality Assurance Plan.

The President of Ebasco Services Incorporated mandates the companywide use of the policies, procedures, and manuals that make up the Ebasco Quality Assurance Program. The corporate Quality Assurance Manual represents the Ebasco Quality Assurance Policy and requirements for the design and construction phase, and it is designed to be in conformance with the requirements of 10 CFR Part 50, Appendix B. The Quality Assurance Manual is prepared by the Quality Assurance Engineering Department and approved by the Quality Program Committee. Implementation and administration of the Quality Assurance Program is the responsibility of the Vice President, Materials Engineering and Quality Assurance.

The General Electric Nuclear Energy Product and Quality Assurance Operation staffs are responsible for establishing the Nuclear Energy Business Group quality related policies and instructions for the various functional organizations shown in Figure 3. The Manager, Product and Quality Organization, is responsible for communicating with the quality assurance organizations and specifying how they are to comply with the quality-related instructions and procedures. The Senior Vice President and Group Executive has established a Quality Council, chaired by the Manager, Product and Quality Assurance Operation and consisting of quality assurance managers responsible for each of the major organizations within the Nuclear Energy Business Group to provide communications in order to ensure total quality

system coverage, consistency, and continuity. GE has established and implemented an overall quality assurance program to encompass all activities within their areas of responsibility and services provided for the facility.

The QA organizations of HL&P, Ebasco, and General Electric are required to be involved in the review and concurrence of quality-related procedures to assure they contain the necessary quality requirements.

(d) The HL&P Project Quality Assurance Group and the necessary technical organizations participate early in the quality assurance program definition stage to determine and identify the extent that quality assurance controls are to be applied to specific structures, systems, and components. For those items determined to be important to safety where the specific quality assurance controls cannot be imposed in a practical manner, an evaluation will be made to determine special quality verification requirements to be applied during installation or testing to provide the necessary assurance that the item(s) meet project requirements. In addition, implementation reviews such as interviews with personnel performing the activity, observations of work in progress, and reviews of final work will be performed by HL&P quality assurance personnel to evaluate the effectiveness of the quality assurance program.

The project QA organization participates in defining the scope of the inspection program. Procedures provide criteria for determining the accuracy requirements of inspection equipment and criteria for determining when inspections are required or define how and when inspections are performed.

The applicant's Quality Assurance Plan requires that Ebasco and GE provide a program for inspection, including the establishment of witness and mandatory inspection hold points beyond which work may not proceed until inspected by a designated inspector.

Quality verification inspection, witness of testing activities, and evaluation of test results are performed by individuals in the Ebasco Project Quality Assurance/Quality Control organizations who report to the Ebasco Quality Program Site Manager. These individuals do not have direct responsibility for performing the work being verified. Quality verification activities will be performed in accordance with inspection documents which have been prepared by the Site Quality Assurance group based upon the quality requirements contained in purchase orders, specifications, quality control documents and procedures, and applicable codes and standards.

General Electric requires inspection of materials, equipment, processes, and services to be performed in accordance with established quality assurance procedures or instructions by qualified quality control personnel who are organizationally independent from the personnel who performed

fthe work. The documented quality assurance plans, procedures, or instructions are reviewed and approved by quality assurance personnel and specify mandatory inspection points beyond which work cannot proceed without inspector action. Inspection results are documented and evaluated by quality assurance personnel before release of an item to ensure that inspection results have been satisfied.

(e) The quality assurance programs of HL&P, Ebasco, and General Electric (with the exception of two alternate positions which are acceptable) comply with Regulatory Guide 1.58, Rev. 1, "Qualification of Nuclear Power Plant Inspection, Examination, and Testing Personnel,"[17] and Regulatory Guide 1.146, "Qualification of Quality Assurance Program Audit Personnel for Nuclear Power Plants"[18] for the construction phase of the Allens Creek project.

The applicant requires that an indoctrination and training program be established for personnel performing quality-related activities to assure they have appropriate knowledge of the quality assurance program and achieve and maintain proficiency in implementing procedures in the area of assigned responsibility. The indoctrination and training program includes:

- Proficiency tests given to personnel performing and verifying activities affecting quality. Acceptance criteria are developed to determine if individuals are properly trained and qualified.

- Certificate of qualifications clearly delineating (1) the specific functions personnel are qualified to perform, and (2) the criteria used to qualify personnel in each function.

Allens Creek Project Quality Assurance is responsible for the verification of the proficiency of Ebasco and GE quality assurance personnel.

(f) The size of the applicant's quality assurance/quality control staff is based upon the project schedule and is reviewed and revised as the project schedule changes to ensure that sufficient staffing exists prior to performing quality-related activities.

Upon commencement of major construction activities at the site, designated HL&P and Ebasco quality assurance personnel will be involved in day-to-day plant activities important to safety; that is, the quality assurance personnel will routinely attend and participate in daily plant work schedule and status meetings to assure that (1) they are kept abreast of day-to-day work assignments throughout the plant, (2) there is adequate quality assurance coverage relative to procedural and inspection controls, acceptance criteria, and quality assurance staffing and qualifications of personnel to carry out quality assurance assignments.

The Project Quality Assurance Plan requires that HL&P, prime contractors, and subcontractors develop, document, and implement an audit system and report the audit results to the HL&P Executive Vice President as to the status and adequacy of the quality assurance program they are executing. The audit system, coupled with implementation reviews and regular management assessment and review of the effectiveness of the quality assurance

program, determines whether sufficient staffing of quality assurance/ quality control personnel exists to implement an effective quality assurance program.

(g) The Project Quality Assurance Plan and implementing procedures require HL&P, Ebasco, and General Electric to establish and implement procedures to control the issuance of documents and changes to those documents. Included in the list of documents are as-built drawings and records to assure identification of actual plant design configuration in a timely manner. Project procedures will provide measures to indicate as-built configurations, including review and reissuance of drawings when changes occur.

(h) The applicant has contracted with Ebasco and General Electric to perform the design, engineering, and design verification. Ebasco's Engineering Department Organization is responsible for establishing and translating design criteria into specifications and drawings and design verification. Quality Assurance Engineering performs independent reviews of specifications and drawings to ensure that quality assurance requirements such as inspectability, required performance tests, and control of measuring and test equipment have been included. HL&P's offsite quality assurance personnel perform audits of Ebasco and General Electric to assure that design controls, requirements, specifications, and documents are in accordance with design control criteria. In addition, the onsite Project Quality Assurance group performs implementation reviews to ensure that work is accomplished in accordance with design requirements and that field changes are processed according to design control criteria.

The General Electric Nuclear Energy Business Group engineering organization, in the respective disciplines, is subject to the Nuclear Energy Business Group design control system consisting of controlled design manuals and standards specifications affecting items important to safety. Quality assurance personnel within the various engineering organizations are responsible for assuring that the verification of design is accomplished either through independent design review, the use of alternate or simplified calculational methods, or by the performance of a suitable testing program. Quality assurance personnel are also responsible for providing quality planning for engineering to define quality assurance program and audit requirements and for the review, approval, and distribution of design documents, including changes to those documents.

Conclusion

The staff has reviewed the applicant's QA programs as described above and finds that they meet the requirements of Item I.F.2.

Frederick R. Allenspach

June 1952	- Graduate - Polytechnic Institute of Brooklyn - Degree in Bachelor of Mechanical Engineering
July 1952 to August 1953	- New York Naval Shipyard
August 1954 to August 1956	- Republic Aviation Corporation
August 1954 to August 1956	- Military Service
September 1956 to June 1968	- Employed by the Brookhaven National Laboratory, Reactor Division. Approximately two years as operating shift supervisor in charge of an operating shift on the Brookhaven Graphite Research Reactor (BGRR). Approximately three years as BGRR day shift supervisor responsible for various reactor support activities. Approximately six years as BGRR Assistant Operations Group Leader primarily responsible for the temperature monitoring and reactor fuel management programs. One year as BGRR Operations Group Leader responsible for all operational aspects of the reactor. Included during this period at Brookhaven National Laboratory were several short term supplemental assignments to Brookhaven National Laboratory review and audit committees assigned the responsibility to determine if other Brookhaven nuclear reactors were being operated in accordance with the applicable rules and regulations.
June 1968 to June 1974	- Employed by the Atomic Energy Commission, Directorate of Licensing, Operational Safety Branch. My responsibilities include (as assigned); review and evaluation of applicants organizational structure, technical and administrative qualifications of applicants proposed reactor operating organization, including emergency plans and industrial security plans; development of guides and codification of

present and proposed practices with respect to administrative procedures for the operation of licensed reactors; the review of operating reports from licensed reactors for safety related items; and the preparation of reports relative to operating experiences at licensed reactors.

June 1974 to May 1980

Employed by the AEC/NRC, Division of Project Management, Quality Assurance Branch. My responsibilities include review and evaluation of applicants organizational structure, technical and administrative qualifications of applicants proposed reactor operating organization, development of standards, codes and guides with respect to administrative procedures for the operation of licensed reactors; and the development of uniform acceptance criteria for subjects required to be addressed by license applicants relating to operational safety matters.

May 1980 to Present

Employed by the NRC, Division of Human Factors Safety, Licensee Qualifications Branch. My responsibilities include establishing requirements and qualification standards for licensee management and plant personnel; review and evaluate the technical and managerial qualifications of applicants and licensees; and the development and review of administrative controls for the operation of licensed reactors.

I have attended the MIT course on Light Water Reactor Safety, attended the POPO course in Industrial Defense and Disaster Planning for Privately Operated Facilities sponsored by the Dept. of Army at the Military Police School in Fort Gordon, Georgia, and a Babcock and Wilcox Simulator training course.

QUALIFICATIONS AND EXPERIENCE OF
JOHN WILLIAM GILRAY

Present Position — Title: Principal Quality Assurance Engineer (Nuclear)

Responsibilities: Participates as a senior member of the Office of Nuclear Reactor Regulation - Quality Assurance Branch staff whose function is primarily one of evaluating, from a safety standpoint, reactor construction and operating proposals with response to quality assurance and/or technical specifications. Serves as Senior Nuclear Engineering Specialist for group evaluation of power reactor license applications.

6/63 - 6/72 — Title: Quality Control Engineer for the AEC Space Nuclear Propulsion Office.

Responsibilities: As the SNPO-C on-site Quality Control Engineer in the prime contractor's plant, responsible for monitoring the contractor's quality control program and providing technical direction relative to the testing, inspection and adherence to aerospace-rated quality control procedures for the development of the nuclear rocket engine (NERVA). Directs inspection personnel of the Air Force Plant Representative's office assigned to NERVA program relative to day-to-day inspections and quality surveys.

8/62 - 6/63 — Title: Quality Control Engineer for Bourn's Inc. (Electronic Component Co.)

Responsibilities: Responsible for the Quality Control and Reliability policies and activities in the manufacturing and inspection of potentiometers and relays used in the Aerospace industry. Evaluates the design and inspection processes for adequate quality and reliability requirements.

1/59 - 8/62 — Title: Quality Control Engineer at Alco Products, Inc. (Fabricator of Nuclear Components)

Responsibilities: Responsible for establishing and assuring proper implementation of Quality Control and Quality Assurance requirements for nuclear components from the design purchasing and manufacturing phases thru the shipment of the components of the Navy Nuclear Shipyards.

Schooling: Graduate in BSME 1958

Courses: Optical Tooling Engineering
Radiography and Film Reading

Societies: Society of Non-Destructive Testing
American Society of Quality Control

PE: Registered Professional Quality Engineer