RELATED CORRESPONDENCE

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:	§	
	§	
HOUSTON LIGHTING & POWER	§	
COMPANY, ET AL.	§	Docket Nos. STN 50-498OL
	§	STN 50-499OL
(South Texas Project,	§	
Units 1 and 2)	§	

TESTIMONY ON BEHALF OF HOUSTON LIGHTING & POWER COMPANY, ET AL.

OF

MR. JAMES E. GEIGER
MR. DONALD T. KRISHA
MR. CLYDE L. HAWN

REGARDING

THE QUALITY ASSURANCE PROGRAM FOR STP

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Testimony of Mr. James E. Geiger, Mr. Donald T. Krisha and Mr. Clyde L. Hawn regarding the Quality Assurance Program for STP

Q.1 Panel, please state your names and current positions.

A.1 (JG): James E. Geiger. I am the Project Quality Assurance (QA) Manager, South Texas Project (STP), of the Houston Lighting & Power Company (HL&P).

(DK): Donald T. Krisha. I am the QA Manager for the Houston Area Office of Bechtel Power Corporation (Bechtel) and currently assigned as the Project QA Manager for the STP.

(CH): Clyde L. Hawn. I am the Quality Program Site Manager for Ebasco Services, Inc. (Ebasco) on the STP.

Q.2 Panel, please describe your professional experience and educational background.

A.2 (JG): I graduated from California State University at Sacramento with a Bachelor of Science degree in

Industrial Engineering in 1961. I am a Registered Professional Engineer in Quality Engineering in the State of California.

From 1957 to 1972 I was employed by Aero-jet General Corporation. I began as a clerk in Receiving Inspection and progressed through a number of other assignments, including Supervisor, Receiving Inspection Planning and Data Section and Manager, Documentation Center. My final position was that of Manager, Quality Systems. In that capacity, I had responsibility for QA design review activities, data collection and analysis, training, and systems and procedures for the various programs including Titan, Apollo, and Transtage.

From 1972 to 1974 I was self-employed outside of the QA field. In 1974, I joined Vayo, Inc. as a contract QA Engineer. My assignments varied, but included procedure writing, requisition review, and inspection supervision. From 1976 to 1978 I was employed by the Argonne National Laboratory as a QA Engineer with responsibility for QA systems and procedures.

In February 1978, I joined Bechtel. My initial assignment was as a Senior Engineer on the QA staff. In July 1978, I was appointed QA Supervisor of field activities for the San Onofre Units 2 & 3, where Bechtel was the architect-

engineer, construction manager and constructor. In May of 1979, I was promoted to Project QA Manager for San Onofre Units 1, 2 & 3. As Project QA Manager I was responsible for the total QA program, including design, procurement, construction and startup.

In June 1981, I joined HL&P as Project QA Manager for STP, reporting to Mr. G. W. Oprea, Jr., Executive Vice-President. In that capacity, I have the responsibility for the QA program as described in the response to Q.5.

Q.3 Mr. Krisha, describe your professional experience and educational background.

A.3 (DK): I attended Solono College from 1958 to 1960. From 1960 to 1972, I was employed by Mare Island Naval Shipyard where I served a 4-year apprenticeship as a machinist, 2 years as a journeyman and 6 years as a nuclear inspector. In my capacity as a nuclear inspector, I was responsible for conducting inspections of mechanical and piping systems on nuclear submarine and surface craft. I was also responsible for performing inspections during ship refueling and core loading operations.

I joined Bechtel in 1972 as a Construction Field Engineer and was assigned to the construction management organization at the Rancho Seco Nuclear Generating Station where I was responsible for overseeing the contractor's

installation of the Nuclear Steam Supply System. From 1973 to 1975, I was assigned to work for the Sacramento Municipal Utility District as a Test Coordinator during the Startup and Preoperational Test Program at Rancho Seco.

In December 1975, I was transferred to the San Onofre Nuclear Generating Station (SONGS 2 & 3) Project where I was assigned as a liaison between construction and the design office. In September 1976, I transferred to the QA Department where I was assigned as a QA Engineer on the SONGS 2 & 3 Project. In October 1977, I was promoted to Startup QA Supervisor where I was responsible for directing and supervising the QA/QC activities for the SONGS 2 & 3 Startup and Prerequisite Test Program.

In April 1979, I was promoted to QA Manager/Domestic Projects where I have been responsible for managing Bechtel QA activities on the Palo Verde, Vogtle and Rancho Seco Nuclear Generating Stations. Shortly thereafter, I was also designated as the QA Manager of the Bechtel Houston Area Office.

I am a member of the American Society for Quality Control, and served on the committee organizing the 1981 Annual ASQC Energy Division Conference in Phoenix, Arizona.

Q.4 Mr. Hawn, describe your professional experience and background.

A.4 (CH): I attended Columbia Basin College, Pasco, Washington, from 1967 to 1970, where I received an Associate Arts & Science Degree. I also attended the University of Washington, Seattle, Washington, on a part-time basis from 1957 to 1962, majoring in aeronautical engineering. I am a Registered Professional Engineer in Quality Engineering in the State of California.

Following graduation from high school, I enlisted in the military service as a private. I served from 1948 to 1956, and was honorably discharged as a first Lieutenant.

I was employed by the Boeing Company from 1956 to 1964, first as a tooling inspector, and then as a tool and production planner on various aerospace projects.

From 1964 to 1971 I was employed by Combustion Engineering as a Manufacturing Engineer, Development Engineer, and Construction Supervisor. As a Manufacturing Engineer, I was responsible for sequential planning of the manufacturing of numerous nuclear reactors, pressurizers, heat exchangers and similar items. As a Development Engineer, I worked primarily on product improvement on various fossil-fueled boilers. The last assignment, for over four years, was as a Construction Supervisor for the retubing of the main heat exchangers and graphite cooling heat exchanger at "N" Reactor, Hanford, Washington.

From 1971 to 1972, I was employed by J. A. Jones Construction Company as a QA Engineer and Assistant QA Manager for the waste processing and storage facilities at Hanford, Washington. I had as many as 40 QA and QC Engineers under my supervision.

From 1972 to 1974 I was employed as Lead QA Engineer by Burns and Roe, Inc. on WPPSS Nuclear Project No. 2, Richland, Washington. I had 10 QA Engineers under my supervision, with the responsibility to perform audits and surveillances over the various site construction contractors. I was also responsible for review and approval of the construction contractors' QA Manuals and procedures.

For six months, during late 1974 and early 1975, I was employed as a Consultant by Control-X Corporation, Richland, Washington. I prepared QA Manuals and procedures for various contractors for use in nuclear construction.

Since May, 1975, I have been employed by Ebasco. My assignments have been Senior QC Supervisor, Construction Superintendent, QA Supervisor, Quality Program Site Manager, and QA Manager of a satellite corporate office. I have been involved on WPPSS Nuclear Project Nos. 3 & 5, Laguna Verde, Waterford Unit 3, and Tokamak Fusion Test Reactor prior to my assignment to the STP.

Q.5 Mr. Geiger, what are your responsibilities for the QA program for the STP?

A.5 (JG): As Project QA Manager for STP, my responsibilities include assuring that HL&P and other major project participants have an effective QA program that fulfills the requirements of 10 CFR Part 50, Appendix B and the regulatory commitments for STP. Additionally, I have responsibility to assure that STP subcontractors and suppliers have a quality program which meets those requirements of Appendix B and the regulatory commitments which are appropriate to their scope of work. These responsibilities are fulfilled through a complex program including review and approval of various documents, audits, surveillances, monitoring, and inspections performed by my staff.

Q.6 Mr. Krisha, what are your responsibilities for the QA program for the STP?

A.6 (DK): In my capacity as QA Manager of the Houston Area Office, I have been involved with the STP beginning with preparation of Bechtel's proposal to HL&P for STP. I was designated as the Project QA Manager for STP during the transition. In my capacity as Project QA Manager, I am responsible for managing and directing all of Bechtel's QA/QC activities at STP. I receive support in specialized

areas such as the ASME Code and welding processes from Bechtel's Codes and Standards group and in metallurgy from Bechtel's Materials and Quality Services group. I was also responsible for the preparation of Bechtel's portion of the STP Quality Assurance Program Description (QAPD), Revisions 2 and 3, and Bechtel's Project Quality Program Manual (PQPM). Mr. Lester Hurst, who is presently the Project QA Manager for Bechtel at the San Onofre Nuclear Project, will soon be assigned to replace me as Bechtel's STP Project QA Manager. In that position, he will receive technical and administrative direction from me.

Q.7 Mr. Hawn, what are your responsibilities for the QA program for the STP?

A.7 (CH): As Quality Program Site Manager, I am responsible for the overall management of the Ebasco QA/QC department at STP. I was involved with STP beginning with the preparation of the proposal made by Ebasco for performing the role of constructor on STP. Where necessary, I call on support from the various specialized disciplines within the Ebasco QA Department, such as materials application, NDE, and codes and standards.

Q.8 Panel, what is the purpose of your testimony?

A.8 (JG, DK, CH): The purpose of our testimony is to describe the QA program for the STP as it has been recently

revised to incorporate the new roles of Bechtel as architect-engineer and construction manager and Ebasco as constructor.

Q.9 Is the revised QA program described in Revision 3 of the STP Quality Assurance Program Description (QAPD) which was submitted to NRC by letter of March 9, 1982?

A.9 (JG, DK, CH): Yes.

Q.10 What was your involvement in the preparation of Revisions 2 and 3 to the QAPD?

A.10 (JG): The QAPD consists of three Parts. Part A, which summarizes HL&P's QA Program for the STP, describes the responsibilities and quality requirements pertinent to HL&P and all other participants including Bechtel, Ebasco and Westinghouse. Part B describes Bechtel's Quality Program for STP, which consists of Bechtel's Topical Report, BQ-TOP-1, Revision 3A, as modified to reflect Bechtel's specific responsibility at STP for engineering, procurement, construction management and QA. Part B also describes the responsibilities of Ebasco and other contractors for submitting to Bechtel, for approval, a quality program which is consistent and compatible with the applicable sections of Bechtel's Topical Report. Part C describes Ebasco's Quality Program for STP, which consists of Ebasco's Topical Report, ETR-1001, Revision 10A, as modified to reflect Ebasco's responsibility at STP for construction and associated QA/QC

services, and to be consistent with the HL&P a d Bechtel QA Programs.

I had responsibility for the preparation of the HL&P section (Part A), as well as responsibility for approving the Bechtel and Ebasco portions, Parts B and C, respectively. Revision 2 of the QAPD was written after Bechtel had been selected as architect-engineer and construction manager, but prior to the selection of Ebasco as constructor. Thus, it contained Part A, for which I was responsible, and Part B, which I reviewed and approved.

After Ebasco was selected as constructor it prepared Part C, which I also reviewed and approved; and minor revisions were made to Parts A and B to reflect the division in the scope of responsibilities between Bechtel and Ebasco. These then comprised Revision 3 of the QAPD submitted to the NRC by letter of March 9, 1982.

(DK): Prior to beginning preparation of Part B, I met with Mr. Geiger and other HL&P and Bechtel personnel to identify those portions of BQ-TOP-1, Rev. 3A, that would need to be modified in light of HL&P's overall QA program at STP and to reflect Bechtel's responsibilities at STP. My staff then prepared Part B, which, after review and approval by HL&P, was submitted to NRC as part of Revision 2 of the

QAPD. After Ebasco was selected as constructor, we made minor revisions in Part B as described by Mr. Geiger. We also reviewed Part C to assure that it satisfied the requirements of Bechtel's QA program.

(CH): As Quality Program Site Manager for Ebasco at STP, I was responsible for preparation of Part C of the QAPD. I reviewed Parts A and B of the QAPD, and analyzed both the interface requirements among Ebasco, Bechtel, and HL&P, and the role Ebasco would play as the constructor. I, along with my staff, modified ETR-1001, Rev. 10A, the Ebasco Nuclear Quality Assurance Program Manual, to make it consistent and compatible with Parts A and B. The draft revision of ETR-1001, Rev. 10A, modified for STP, was submitted to both Bechtel and HL&P for review and comment, and their comments were resolved in the final version of Part C contained in the STP QAPD, Rev. 3.

Q.11 To the best of your knowledge and belief, are the contents of Revision 3 of the QAPD a true and correct description of the QA program for the design and construction of the STP?

A.11 (JG, DK, CH): Yes.

Q.12 Mr. Geiger, since Mr. Frazar's May 1981 testimony concerning the program for accomplishing QA, including QC,

on STP, has there been a basic change in the framework of the QA program at STP?

A.12 (JG): Since Mr. Frazar's testimony, HL&P has replaced B&R as architect-engineer and construction manager with Bechtel and has replaced B&R as constructor with Ebasco. Coincident with these changes, HL&P has modified, and, in my judgment, improved the QA program at STP.

As described in more detail below, Bechtel, which has a vast amount of nuclear experience, is implementing a QA program at STP based upon successful Bechtel programs in place at other projects. As architect-engineer and construction manager, Bechtel has the responsibility not only for its own QA program, but also for assuring that Ebasco, the constructor, has an acceptable program. Verification of implementation of both Bechtel's and Ebasco's program is achieved through a series of document reviews, surveillances, audits, and redundant inspections by Bechtel. Thus, except in those areas in which Bechtel will have first-line QC responsibilities in the field, there is an additional level of QA review of construction that did not exist when one contractor performed all of these functions. As constructor, Ebasco has the primary responsibility for its own QA/QC program, including responsibility for first-line inspection

of Ebasco activities. As discussed in more detail below, Ebasco additionally assures appropriate implementation of its program through document review and approval, surveillance and audit.

As co-owner and licensee, HL&P has ultimate responsibility for the entire Project QA program and fulfills that responsibility through various actions. Included are review and approval of selected documents, an aggressive surveillance and audit program (which is discussed in more detail in response to Questions 14 and 19) and a limited program of redundant inspection of selected characteristics/components.

Q.13 Since Mr. Frazar's testimony, have there been any changes in the way the HL&P Project QA staff is organized? If so, please describe.

A.13 (JG): A chart depicting the current HL&P QA organization for STP is attached as Figure 1. As shown on Figure 1, the Project QA Manager will report to the Manager, QA. Since the latter position is now vacant, I report directly to the Executive Vice President.

The major responsibilities of the groups shown on Figure 1 are unchanged. Minor revisions have been made to some group titles to reflect their duties more accurately, e.g., Quality Systems is now entitled Quality Systems/ Administration.

There has been only one other minor change in the HL&P Project QA organization since Mr. Frazar's testimony. The position of Licensing Support Project QA Supervisor was eliminated because it was determined that its functions could more effectively be assigned within the STP Licensing Department.

Q.14 Since Mr. Frazar's testimony, have there been any significant changes in the way that HL&P Project QA performs its QA program verification activities?

A.14 (JG): There has been one change which, in my judgment, is significant. The process of verifying compliance to the QA program requirements by HL&P Project QA is currently accomplished by the implementation reviews described in Mr. Frazar's testimony. All HL&P audits of the Project, including audits of performance of both HL&P and the contractors, are performed by the HL&P corporate QA Audit Section.

We are now in the process of establishing an audit program to be implemented by the Project QA staff. As described in A.19, under this program the Project QA staff will perform audits instead of implementation reviews and the corporate QA Audit Section will audit only HL&P QA activities on the Project; the audit of Bechtel and Ebasco activities will be performed by HL&P Project QA.

Implementation reviews and audits are virtually identical; both require written checklists, documented results, etc. The difference is in the qualifications of the personnel who perform them. Briefly, stated, personnel who perform audits must be certified to the requirements specified in ANSI N45.2.23.

Since in order to be certified as an auditor, an individual must have performed a specific number of audits under the direct supervision of a certified lead auditor, the certification of Project QA staff members as auditors will occur gradually over the course of 1982. During that period, the Project QA staff's verification activities will include a combination of implementation reviews and audits, in accordahce with a plan that will insure complete QA Program verification of the activities on the site.

Q.15 Mr. Krisha, please describe the Bechtel QA organization for the STP.

A.15 (DK): Figure 2 shows the Bechtel Project QA organization. Bechtel's QA program for STP is under the auspices of Bechtel's Los Angeles Power Division (LAPD). The Manager of Division QA reports directly to the Vice-President and Division General Manager. The Manager of Division QA is at the same managerial level in the organization as the Managers of Division Engineering, Construction

and Procurement. He receives technical assistance from the Manager of QA for Bechtel Power Corporation. The LAPD Manager of Division QA has a staff of managers that includes the QA Manager for the Houston Area Office, who is responsible for a number of projects, including STP. The QA Manager for the Houston Area office provides technical and administrative direction to the STP Project QA Manager.

The Project QA Manager, with the assistance of higher levels of QA Management and the support of Division QA staff, is responsible for assuring the satisfactory implementation of the Project Quality Program. The Project QA Manager coordinates with the Project Manager on day-to-day Project matters relative to the Quality Program. He is responsible for the QA/QC Engineers' Project activities and for reporting the status of the Quality Program to management.

The Bechtel STP QA organization consists of three sections reporting to the Project QA Manager. The three sections are supervised by two Project Quality Assurance Engineers (PQAE's) and one Project Quality Control Engineer (PQCE).

The Design Office PQAE is responsible for assuring the orderly and adequate implementation of the Quality Program in the Design Office. This is accomplished through

review, surveillance, and audits of engineering and procurement activities.

The site PQAE is responsible for assuring that construction activities (including field procurement) comply with approved Quality Program and engineering requirements. These responsibilities are accomplished by surveillance of in-process and completed work, reviews of documentation, and audits for Quality Program compliance.

The PQCE is responsible for performing QC inspections associated with Bechtel's job site activities, such as receipt, storage and maintenance of permanent plant items. He is also responsible for verifying the effectiveness of the contractor's QC program. This is accomplished through surveillance and redundant inspections of selected work activities which had previously been accepted by the contractor's QC personnel.

Under Bechtel's Quality Program the Project QA Manager has stop work authority over quality-related portions of STP activities. This authority is also delegated to the Design Office and site PQAE's and to the site PQCE.

Q.16 Please describe the overall Bechtel Quality Program at STP, including the programs applicable to engineering, construction management and procurement.

A.16 (DK): The overall Bechtel Quality Program is based on the Bechtel Topical Report, BQ-TOP-1, Rev. 3A. This Topical Report describes the measures used to comply with 10 CFR Part 50 Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants. Additionally, the Topical Report describes the Bechtel position concerning certain QA related Regulatory Guides. The Topical Report and the Bechtel Regulatory Guide positions have been approved by the Nuclear Regulatory Commission.

The Bechtel South Texas Project Quality Program Manual (PQPM) is based on the Topical Report. Unique construction management subjects are addressed, as well as unique Project requirements.

Bechtel QA is responsible for (1) review and approval of quality-related procedures and instructions, and (2) audit and surveillance of the activities and documentation of organizations and individuals involved in the implementation of the Quality Program.

Bechtel management is notified by reports and during management meetings of the status and adequacy of the Quality Programs of divisions and projects. Management external to the QA organization and levels above the Project review the status and adequacy of the Quality Program implementation through audit reports, management staff meetings

and an annual review meeting which covers the status of the quality programs of the various Bechtel divisions and projects. Action items are determined during these review meetings, responsibility established and results reported to the division Vice President and General Managers.

Individuals associated with the QA organization or who are responsible for verifying quality of activities are organizationally independent of those who perform those activities.

The following is a general description of the quality programs applicable to engineering, procurement and construction.

Engineering

Project Engineering, directed by the Project Engineering Manager, is responsible for all Bechtel engineering design work performed by and for the Project and for checking and review functions performed on the Project. The Project Engineering Manager is also responsible for any special design work conducted off the Project and for requiring that it be subjected to the same degree of checking and control as that conducted on the Project. Key design work is also reviewed off the Project by personnel on the staffs of the Chief Engineers. Bechtel QA is responsible for conducting audits, surveillances and document reviews of engineering work activities.

Procurement

Procurement specifications for materials and equipment are prepared by Engineering and reviewed by QA for adequacy of specified QA program and documentation requirements. The need for quality surveillance is determined by Engineering based on the complexity and importance of the material or item.

Procurement contracts are awarded only after a supplier's capabilities to meet the Project's quality requirements have been verified and his Quality Program or plan has been reviewed by Bechtel Engineering and Procurement Supplier Quality (PSQ) and concurred with by QA.

After contract award, PSQ performs surveillance and inspection of supplier activities, and reviews completed supplier quality verification documents at the supplier's facility. Receiving inspection of items, including review of records not previously examined by PSQ, is performed by Bechtel's QC group at the construction site.

The supplier's conformance to purchase documents is determined by PSQ based on surveillance reports, periodic audits, jobsite receiving inspection results, construction nonconformance reports and reports from other divisions and projects.

QA monitors this process and performs audits and surveillances to assure effective implementation. QA has the authority to stop supplier work and shipments until required corrective action has been taken and verified.

Construction

The Bechtel Construction Management organization is responsible for the overall construction program for the STP. Its functions consist of planning, scheduling, monitoring and evaluating the Ebasco and contractor construction and QA/QC activities. Construction Management's activities are performed in accordance with approved procedures and are monitored by Bechtel QA through audits and surveillances.

Each contractor, including Ebasco, is held responsible for performing construction work within the scope of his contract in accordance with approved procedures and his Quality Program. The Ebasco and contractor QA organizations are responsible for first-level inspection of their respective work. The Ebasco and contractor QA organizations are responsible for audits and surveillances of their respective work and QC activities. Bechtel QA is responsible for conducting audits, surveillances and selected redundant inspections of the Ebasco and contractor work and QA/QC activities.

Q.17. Mr. Hawn, please describe the Ebasco QA organization for the STP and summarize how Ebasco will perform QA of construction at STP.

A.17 (CH): The Ebasco QA organization is fully described in Part C, QAPD and is shown in Figure 3. QA is placed in the Ebasco site organization such that it is independent from the various construction departments. As Quality Program Site Manager, my line of reporting is to the Corporate Chief QA Engineer in Ebasco's New York office. I coordinate with the STP Site Manager only to assure communication and administrative continuity. Thus, the Quality Program is free of organizational constraints, such as scheduling or production pressures which could compromise quality related activities.

Ebasco's STP QA organization consists of three basic groups, QA, QC and Quality Records, each headed by a Site Supervisor who reports to me. The QA Supervisor, the QC Supervisor and I all have stop work authority.

The QA Group is responsible for performing planned and scheduled audits of Ebasco activities. The QA group, in conjunction with our New York office, performs trend analysis of nonconformance reports, deficiency reports, etc., to identify trends adverse to quality. Where indicated by trend analysis or other conditions, supplemental audits will

be performed. Trend analysis may also be the basis for corrective action requests to be generated by the QA group. The QA group is the basic contact point between Ebasco and HL&P, Bechtel and NRC audits and inspections, and is responsible for assuring timely and proper responses to those organizations for any deficiencies identified.

The QC Group is responsible for performing inspections and witnessing or performing examinations and tests of all Ebasco nuclear safety-related construction activities. The NDE laboratory and the on-site calibration laboratory report to the Ebasco QC Site Supervisor. All inspections, examinations and tests are required to be documented.

The Quality Records Group is responsible for assembling documentation packages, verifying the completeness and accuracy of the records, providing adequate safeguards and retrievability of records while under Ebasco control, and for transmitting completed records to HL&P.

Ebasco QA/QC personnel are required to be qualified and certified to ANSI N45.2.6, ANSI N45.2.23, and SNT-TC-1A, as appropriate to their work assignments.

QA/QC of construction will be performed in accordance with Part C, QAPD and the implementing Ebasco procedures. All implementing procedures will be submitted to and approved by Bechtel prior to use. These will include QC Procedures

(QCPs), which specify methods and equipment to be used in performing inspections, examinations, and tests; and the documents to be used to provide for recording data and results from the inspections, examinations, and tests. QCP's also provide for control measures such as inspection, examination, and test status, control of nonconformances, and corrective action. Qualification and certifications of QC personnel is also covered.

Ebasco also uses QA Procedures (QAPs), which specify methods of planning, performing, and documenting audits and surveillances performed by Ebasco QA. Auditor qualification and certification, corrective actions, trend analysis, procedure review and approval, and similar QA activities are also specified in the QAPs.

Q.18 Mr. Geiger, how does HL&P fulfill its ultimate responsibility for the proper implementation of the QA program at STP?

A.18 (JG): HL&P fulfills its ultimate responsibility for proper implementation of the QA program at STP through a system of reviews of engineering, procurement, construction management and construction activities.

Our first action was our review and approval of the QA programs of the Project participants. All sections of the STP QAPD, Rev. 3, were approved by my office prior to

submittal to the NRC. The Bechtel Project Quality Program Manual (PQPM) was reviewed and approved by my office. The Ebasco Project Quality Assurance Manual (PQAM) (which is identical to Part C of the QAPD, Rev. 3) was also reviewed and approved by Bechtel.

HL&P conducts an audit, surveillance, and selective redundant inspection program described in more detail below. This helps assure that the procedures and programs of Bechtel, Ebasco and other contractors not only accurately reflect regulatory requirements, but are in fact being rigorously implemented. Close monitoring is achieved by daily activities of various QA personnel, as well as regularly scheduled weekly meetings to review any outstanding problems or situations. These reviews comprise HL&P's performance overview of the Bechtel and Ebasco QA Programs. Where a need for corrective action is identified, HL&P interfaces with Bechtel, and Bechtel is responsible for achieving any necessary correction of the Bechtel and Ebasco quality programs.

Other important activities include Bechtel's and Ebasco's preparation of monthly trend reports, which are submitted to my office for review and analysis, and HL&P's preparation of a trend analysis report. Moreover, periodic reviews of the quality status of the Project are performed by executives of the three participants as well as by Project management.

The performance of the HL&P QA staff is assessed by the HL&P corporate audit staff on at least an annual basis, and an independent assessment of the STP QA program will be conducted annually throughout the life of the project. For 1982, this assessment will be performed by a group of four utilities, which HL&P selected based on their successful nuclear construction projects.

Q.19 How does HL&P conduct its audit and surveillance of the STP QA program?

A.19 (JG): In the response to Question 14, I described how the audit program by HL&P Project QA was being introduced in conjunction with the continuing implementation review activities. My response to this question describes the program once a sufficient number of HL&P Project QA staff members are certified to conduct all of the audits.

The HL&P audit program at STP consists of several parts. The Project QA staff, under my direction, is developing an Audit Plan and an Audit Schedule. The Audit Plan identifies the number of audits which are required to cover all the major components of the STP QA Program. The schedule specifies the time and frequency of these audits. Both are prepared for an annual period and are reviewed quarterly, at a minimum. Additional or supplemental audits may be added at any time. In general, the Project audit program is designed to accomplish

several key objectives. First, to verify that there is an effective system which takes the commitments made in specific regulatory documents (e.g., the SAR, § 50.55(e) reports) and accurately translates them into "work-directing" documents. Second, to verify that the "work-directing" documents are being effectively implemented. Any single audit may be designed to accomplish either or both of these two objectives.

In addition to the Project QA staff activities, the Houston QA management audit staff plays an important role for the STP. The management audit staff has the responsibility for conducting audits of those HL&P organizations which provide services to the STP, such as the procurement organization. The management audit staff also performs audits of the HL&P STP Project Manager and his staff and of HL&P STP Engineering. Additionally, the management audit staff performs audits of the QA program of my organization.

Close coordination exists between the management audits staff and my organization. We are aware of their audit plan and schedule, may provide input to any specific audit plan, attend the pre and post audit conferences, and are available for consultation during the conduct of any specific audit.

In addition to the audit program, there is also an aggressive HL&P surveillance program for STP. Aggressive

surveillance, in my judgment, is the key to maintaining day-to-day control of activities. Such a program requires that the individual QA specialists/engineers spend a significant amount of time witnessing activities, monitoring performance and checking documentation. They provide a constant owner QA "presence" on the site. This aggressive surveillance strengthens and reinforces the audit program.

Finally, the HL&P QA staff will perform limited redundant inspections of selected characteristics/components. These characteristics/components will be selected from previously accepted work at the jobsite, as well as at vendor facilities.

The overall program which I have just described will provide assurance that the Quality Program for STP is being effectively implemented.

Q.20 Please describe how the QA program is being implemented with respect to current STP caretaker and transition activities.

A.20 (JG): By April 1, 1982, Bechtel and Ebasco completed the assumption of responsibility from B&R for caretaker activities at the job site. Bechtel's responsibilities include receiving, inspection, warehousing, and maintenance for those items which are not released to construction.

Ebasco has responsibility for the maintenance of all items that have been issued for construction and/or installed.

These activities are conducted according to approved Bechtel and Ebasco procedures. Personnel performing these activities are appropriately trained, qualified and certified. Both Bechtel and Ebasco perform surveillances, audits and inspections over the activities within their respective scopes of work. In addition Bechtel QA performs surveillances, audits, and redundant inspections over Ebasco's work, as does HL&P QA with respect to both Bechtel's and Ebasco's programs.

Continuing transition activities in the areas of engineering, procurement, construction and QA are being conducted by Bechtel in general accordance with the transition program (as described in the testimony of Messrs. Goldberg, Lex and Crnich), the QA program and implementing procedures. All activities are subjected to audit and surveillance by both Bechtel and HL&P.

Q.21 Mr. Krisha, please describe the expected Bechtel manpower levels in staffing QA for the STP and provide a brief description of the backgrounds of key personnel.

A.21 (DK): It is anticipated that Bechtel QA manpower for the STP will peak at the following levels:

Management

1 Project QA Manager

Design Office

1 Project QA Engineer

1 QA Supervisor

6 QA Engineers

Field

1 Project QA Engineer

3 QA Supervisors

10 QA Engineers

1 Project QC Engineer

1 Lead QC Engineers

30 QC Engineers

Key Bechtel QA personnel on the STP include the following:

The Project QA Manager will be L. W. Hurst. Mr. Hurst is presently assigned as the Project QA Manager at SONGS Units 1, 2 & 3. Mr. Hurst has eight years of nuclear QA experience with Bechtel. He has held assignments on the Kuosheng Nuclear Project at both the design office and jobsite. Mr. Hurst has a Bachelor of Science degree in Industrial Technology.

The Design Office PQAE is K. R. Dotterer. Mr. Dotterer has 16 years of QA/QC experience, including seven

years with Bechtel. He was previously assigned to the Houston Area Office where he was the PQAE for the Nelson and Parish projects. Prior to that assignment, Mr. Dotterer was a Senior QA Engineer and assistant to the PQAE on the Vogtle Nuclear Project. Mr. Dotterer was also assigned as a Procurement Supplier Quality Supervisor for the Midland Nuclear Project. Prior to joining Bechtel, Mr. Dotterer was a commissioned officer in the U.S. Navy.

The jobsite PQAE is W. F. Houston. Mr. Houston has 17 years of nuclear QA/QC experience, the last one and one-half years with Bechtel. He was previously assigned as a QA Supervisor to the Grand Gulf Nuclear jobsite where he was responsible for the site audit and surveillance program. Prior to working for Bechtel, Mr. Houston worked for Gibbs Hill, Inc. as a Senior QA Engineer; New York State Electric and Gas Inc., on the New Site Nuclear Project as a Supervising Senior QA Engineer; and General Electric Corporation in various engineering and QA positions. Mr. Houston has a B.A. in Industrial Management.

The PQCE is R. A. Meggison. Mr. Meggison has 15 years of QA/QC experience, including five years with Bechtel. He was previously assigned to the SONGS Units 2 & 3 Nuclear Project where he was Assistant Project QC Manager responsible

for welding, piping, mechanical, pipe supports and receiving inspection disciplines. Prior to joining Bechtel, Mr. Meggison spent 23 years in the U.S. Navy.

Q.22 Mr. Hawn, please describe the expected Ebasco manpower levels in staffing QA for the STP and provide a brief description of the backgrounds of key personnel.

A.22 (CH): The expected peak Ebasco QA/QC manpower levels are as follows:

1	Quality Program Site Manager
1	QA Site Supervisor
8	QA Engineers (various disciplines)
1	QC Site Supervisor
4	Lead QC Engineers
10	QC Supervisors
4	QC Engineers
138	Sr. Inspectors, Inspectors and Technicians
1	Quality Records Supervisor
6	Quality Records Reviewers
174	Total

Key Ebasco Quality Program personnel on the STP include the QA Site Supervisor, R. A. Cummings, and the QC Site Supervisor, R. P. Grippardi.

Mr. Cummings has over 11 years experience in design, construction, and QA of power plants, both fossil

and nuclear. For the past five years he has been employed by Ebasco as a QA Engineer, Principal QA Engineer, and QA Supervisor. He has worked at Laguna Verde and W.A. Parish Unit 8, and performed preliminary QA functions on Allens Creek. Prior to being employed by Ebasco, Mr. Cummings was employed by Pennsylvania Power & Light Co. as an engineer and Project Engineer on the Susquehanna nuclear plant. He has a BSCE from Drexel University and is a Registered Professional Engineer in the state of Pennsylvania.

Mr. Grippardi has over 12 years experience in power plant QA, both fossil and nuclear. He has been employed by Ebasco for the past seven years, and was previously employed by Ebasco from 1964 to 1968. He has held the positions of Ass't. QA Engineer, QA Engineer, QA Site Supervisor, and QC Site Supervisor. Projects Mr. Grippardi has been involved with include W.A. Parish Unit 8, Allens Creek, Laguna Verde, Angra Unit 1, St. Lucie Unit 1 and H.B. Robinson Unit 2. Mr. Grippardi also worked for Westinghouse for three years as a Senior QA Engineer. Mr. Grippardi has a Bachelor of Engineering degree from Stevens Institute of Technology.

Q.23 Mr. Geiger, please describe the expected HL&P manpower levels in staffing QA for the STP and provide a

brief description of any changes in key personnel since Mr. Frazar testified.

A.23 (JG): The HL&P Project QA peak manpower level for STP is expected to be as follows: professionals 25, supervisors 7, manager 1. That is a total of 33.

The principal change in key Project QA personnel since Mr. Frazar testified, is that I replaced Mr. Frazar as the Project QA Manager. Mr. Frazar reassumed his previous duties as the Corporate QA Manager for HL&P, but that position has been vacant since February 1, 1982 when he assumed new responsibilities as Manager, Engineering Assurance Department.

Additionally, changes in Project QA staff include the following: Mr. D. R. Keating is now the General Supervisor for Quality Engineering replacing a consultant who previously held that position; Mr. D. F. Bednarczyk is now the Civil/Structural Supervisor replacing Mr. R. Carvel, who resigned; Mr. T. J. Jordan has been reassigned from Quality Systems Supervisor to Supervisor of Design/Procurement QA replacing Mr. H. G. Overstreet who was reassigned to Supervisor, QA Training and Administration in the corporate QA department; and Mr. J. W. Estella was appointed Supervisor of Quality Systems/Administration to replace Mr. Jordan.

Mr. Keating has over eight years of nuclear QA experience, including almost eight years with Consumers Power Company at its Midland Plant. He is a Certified Level III Inspector and a Certified Lead Auditor. He received a Bachelor of Science degree in mechanical engineering from Michigan Technological University in 1970. The qualifications of the others are summarized in Applicants' Exhibit 39.

Q.24 Panel, please describe the status of development of QA procedures and other preparation for implementation of the QA program for design and construction activities at STP.

A.24 (JG): HL&P is currently implementing its QA program for design and construction activities at STP. The Project Quality Assurance Plan (PQAP) has been issued. Implementing Project QA procedures have been issued and appropriate training conducted on those procedures. The audit plan and schedule are in the approval process. Certification of QA personnel as auditors is currently under way. In the interim, as I have described, the audit plan will be implemented in conjunction with an implementation review plan to assure that full coverage is maintained until sufficient auditors are certified.

(DK): The Bechtel PQPM and QA procedures relating to audits, surveillance and document reviews have been

issued. At the site, Work Plan Procedures (WPP) and QC Instructions (QCI) for Bechtel caretaker activities have been issued. WPP/QCI's for Bechtel construction management activities are in preparation and many have been issued. In the Design Office, Engineering Department Procedures and Procurement Procedures have been issued. Training of Project personnel is in process and will be ongoing throughout the life of the Project.

(CH): Ebasco has identified those QA and QC procedures required for implementation of Part C, QAPD. Similarly and concurrently, construction and administrative procedures have been identified. The QA/QC procedures required for caretaker activites have been completed and approved by Bechtel. Preparation of the remaining procedures has been scheduled, based on planned construction activities, to be completed and approved sufficiently in advance of the construction activity to insure adequate training of QA/QC personnel in the implementation of the procedures.

Q.25 Panel, does the revised QA program for STP comply with the requirements of Appendix B to 10 CFR Part 50?

A.25 (DK): Yes, it does. As stated earlier, the Bechtel STP Quality Program is based on the Bechtel Topical Report and other LAPD Quality Program documents which address

Appendix B of 10 CFR Part 50 and specific ANSI Standards and NRC Regulatory Guides. The Project Program contains all the Quality Program elements of these documents but is more expansive and detailed. The requirements of Appendix B of 10 CFR Part 50 are individually addressed in the Project Quality Program Manual (PQPM), with the same prefix identification numbers as the criteria of Appendix B and the sections of the Topical Report. This provides rapid reference from one document to the other. The PQPM also contains an identifying matrix of quality related manuals of all Bechtel STP organizations. The matrix provides rapid cross reference from Appendix B and Bechtel quality related manuals to the PQPM.

(CH): Yes, it does. The Ebasco Quality Program Manual for STP is based on ETR-1001, Ebasco Nuclear Quality Assurance Program Manual. ETR-1001 was originally approved by the NRC in 1975. The current revision to ETR-1001, Rev. 10A, was approved by the NRC in June, 1981. For STP, ETR-1001 was modified to delete those sections that apply only to responsibility for design, procurement, and construction management and to make it consistent and compatible with both HL&P's PQAP and Bechtel's PQPM for STP. The Ebasco Quality Program Manual contains a matrix identifying the manual sections that show compliance with the 18 criteria of Appendix B, 10 CFR 50.

(JG): Yes, it does. Revision 3 of the QAPD summarizes how the HL&P, Bechtel and Ebasco portions of the STP QA program satisfy each of the 18 criteria of Appendix B. I supervised and participated in the preparation of that document. Preparation of that document required me to evaluate the STP QA Program and how it fulfills each of the criteria of Appendix B and the various Regulatory Guides and industry standards that further interpret and elaborate upon Appendix B. I am fully satisfied on the basis of my evaluation that the new program fully complies with the applicable requirements.

Q.26 Panel, what reason is there to believe that the revised STP QA program will be properly implemented?

A.26 (DK): Bechtel QA assures the quality adequacy of work and program implementation by document reviews, Project system and product audits, QA staff management audits, surveillances, and monitoring activities. Important quality information is received from other Bechtel projects through Division QA staff. Such information describes problems arising at other projects and defines the investigative and corrective actions taken. In this way, the STP has the benefit of total Bechtel experience.

Information from these sources is reviewed and used to provide Division and Project management with a report of the status and adequacy of the Project quality

program. The status and adequacy of Project QA program implementation is regularly transmitted to Project and Division management for review and evaluation. The information is transmitted using Project audit and status reports, reports of significant deficiencies and substantial safety hazard defects and associated corrective and preventative actions. Reports to date indicate that the QA program at STP is satisfactory and is being properly implemented, and the steps I have described will assure that satisfactory performance continues.

(CH): The Ebasco QA program for STP is based on ETR-1001, the Ebasco Nuclear Quality Program Manual. This program is currently in force at Waterford Unit 3 and WPPSS Nuclear Projects Nos. 3 & 5, and has proven to be effective. Key points of the program that assure it will be satisfactorily implemented at STP are:

- Independence of Ebasco QA/QC personnel from construction.
- Stop Work authority for QPSM, QASS, QCSS.
- Planned system of inspections, audits, and surveillances, with reports going to management.
- Top management support.
- Access to top management of all QA/QC personnel (open door policy).
- Trend analysis of nonconformances distributed company-wide.

- Required documentation of all inspections, audits, and surveillances.

- Planned Management audits of overall program effectiveness.

- Adequate training of all personnel in quality requirements.

- Staffing with adequate numbers of qualified personnel.

(JG): Our testimony has explained, in some detail, the QA program for STP. We described how the requirements documents, such as the QAPD and the PQAP, were generated and approved. We discussed the initiation, review and approval of implementing procedures, and provided a description of how the program will function. The aggressive audit and surveillance program by HL&P was fully explained. The QA program at STP bears the same hallmarks as viable programs implemented by other utilities for projects that have been successful. The program is managed by experienced and capable personnel who will ensure it is diligently executed. Feedback from my staff, review of documents, and my own personal contacts with QA management and personnel of Bechtel and Ebasco give me the highest confidence that the QA program at STP will be successfully implemented.

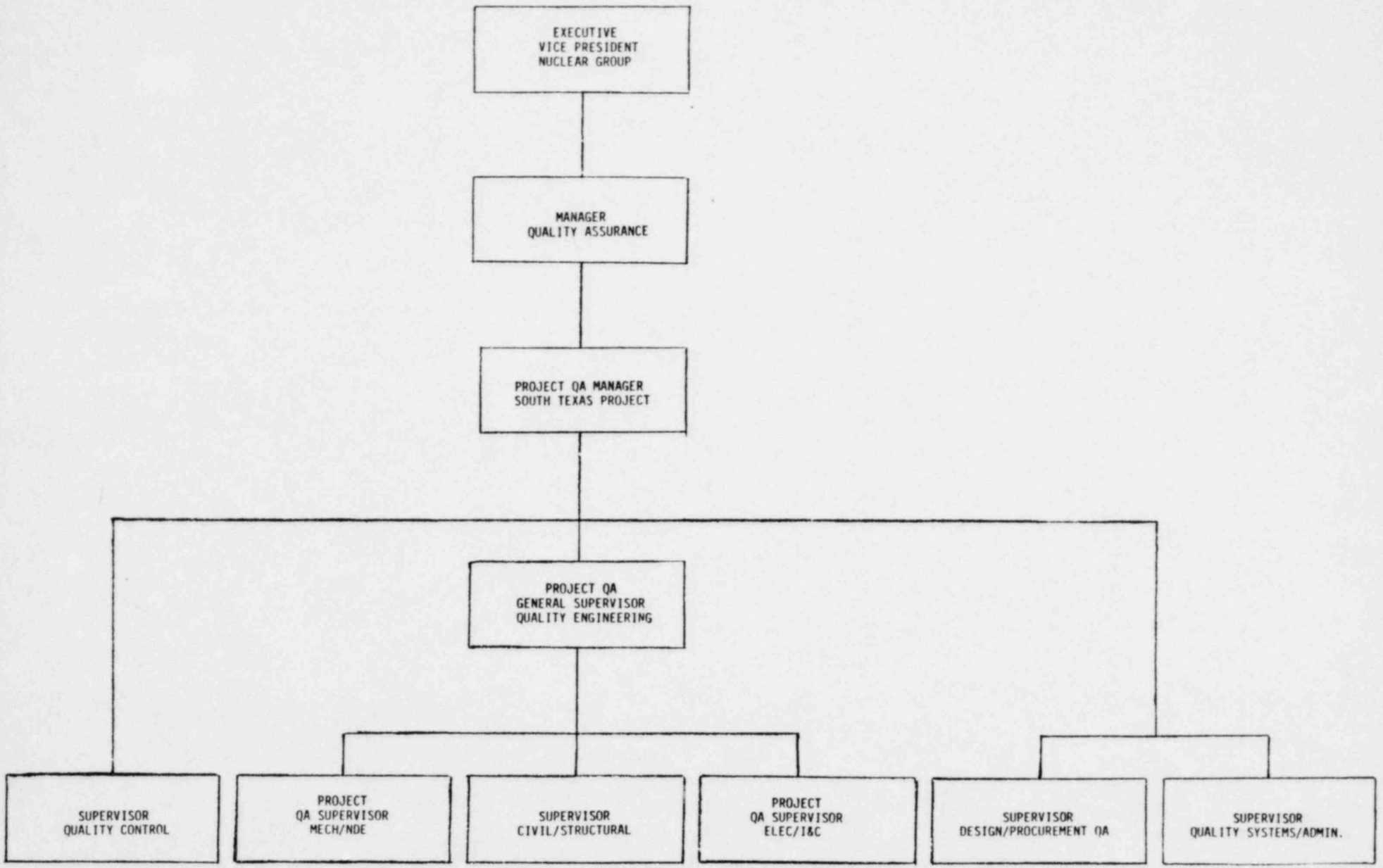
TBH:01:C

HL&P QUALITY ASSURANCE

ORGANIZATION FOR

STP

FIGURE 1



BECHTEL POWER CORPORATION
QUALITY ASSURANCE ORGANIZATION FOR STP

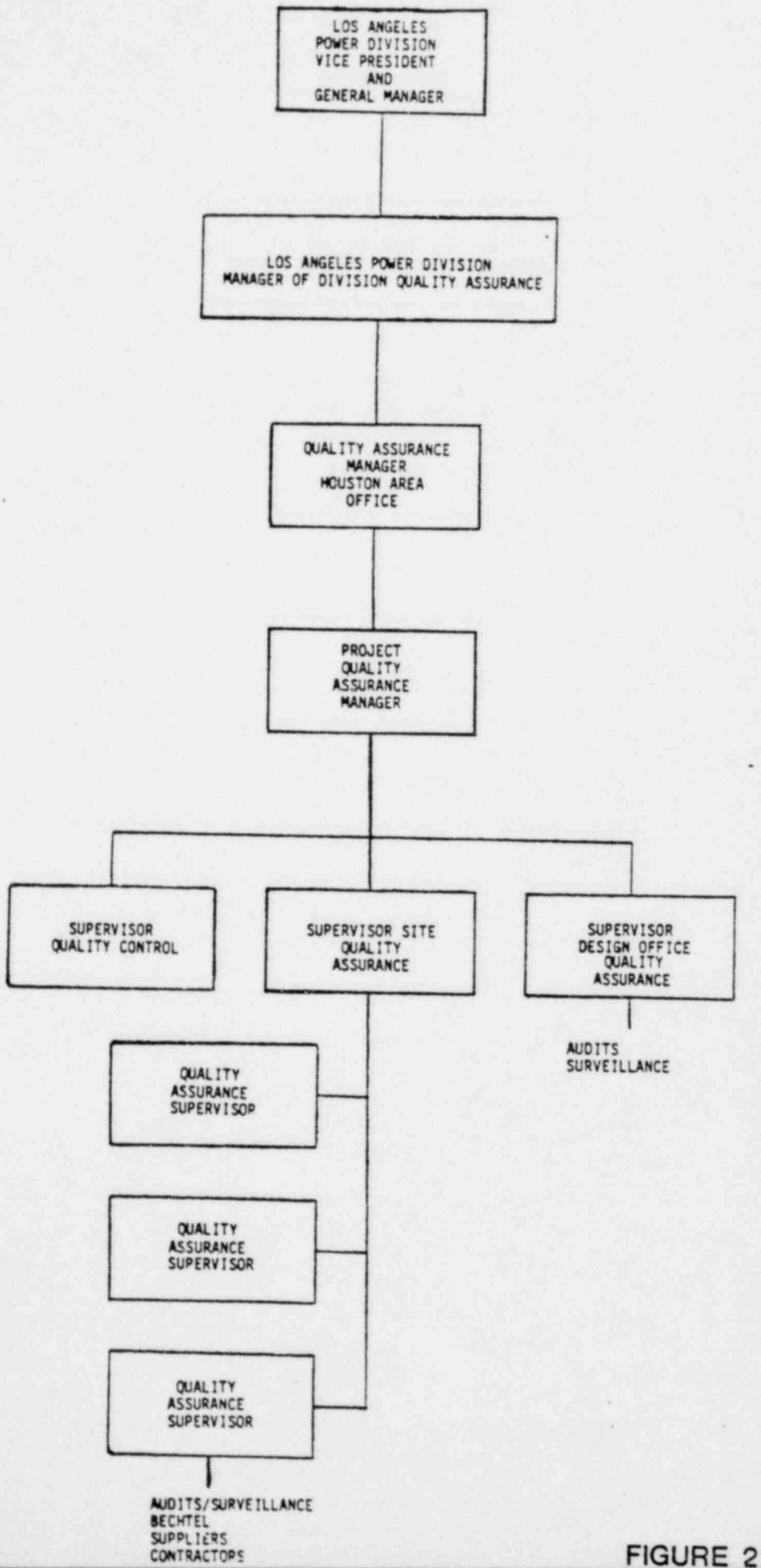


FIGURE 2

EBASCO QUALITY ASSURANCE

ORGANIZATION FOR

STP

FIGURE 3