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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:

HOUSTON LIGHTING & POWER
COMPANY, ET AL.

(South Texas Project,
Units 1 & 2)

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Docket Nos. 50-498OL
50-499OL

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

OF

MR. JEROME H. GOLDBERG
MR. BURTON L. LEX
MR. JOHN CRNICH

REGARDING

THE MANAGEMENT OF THE SOUTH TEXAS PROJECT

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5 UNITED STATES OF AMERICA
6 NUCLEAR REGULATORY COMMISSION
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10 BEFORE THE ATOMIC SAFETY AND LICENSING BOARD
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13 §
14 HOUSTON LIGHTING & POWER § Docket Nos. 50-498OL
15 COMPANY, ET AL. § 50-499OL
16 §
17 (South Texas Project, §
18 Units 1 & 2) §
19 §
20

21
22 TESTIMONY OF MR. JEROME H. GOLDBERG, MR. BURTON L. LEX,
23 AND MR. JOHN CRNICH
24 REGARDING THE MANAGEMENT OF THE SOUTH TEXAS PROJECT
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26
27 Q.1. Panel, please state your names and current posi-
28 tions.
29

30
31 A.1. (JG): I am Jerome H. Goldberg, Vice President for
32 Nuclear Engineering and Construction at Houston Lighting &
33 Power Company (HL&P).
34

35
36 (BL): I am Burton L. Lex, Project Manager for the
37 South Texas Project (STP) at Bechtel Power Corporation
38 (Bechtel).
39
40

41
42 (JC): I am John Crnich, Construction Manager for the
43 STP at Ebasco Services Incorporated (Ebasco).
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46 Q.2. Please describe your educational background and
47 professional experience.
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5 A.2. (JG): My educational background and professional
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7 experience are described in my previously filed testimony on
8
9 the current management of STP.

10
11 (BL): I received a Bachelor of Science degree in
12
13 Chemical Engineering from Oregon State University in 1952.
14
15 I have 29 years of professional experience, 26 of which have
16
17 been in the nuclear field. I am a Registered Professional
18
19 Engineer in the State of California in the chemical, mechanical
20
21 and nuclear disciplines and hold Professional Engineer
22
23 registrations in the states of Arkansas and Massachusetts.
24
25 Since joining Bechtel in 1957, I have been assigned to
26
27 several positions of increasing responsibility. From 1958
28
29 to 1964 I held supervisory and senior engineering positions
30
31 on Humboldt Bay Unit 3, Peach Bottom Unit 1, the Nuclear
32
33 Fuel Services Reprocessing Plant at West Valley, New York,
34
35 and several industrial projects. From 1964 to 1968 I served
36
37 as Engineering Consultant to Union Electric Madrilena on the
38
39 Zorita Nuclear Power Plant. In 1968, I was named Project
40
41 Engineer on the Arkansas Nuclear One Project Units 1 and 2
42
43 and later, Pilgrim Station Unit 2.

44
45 In 1972 I was promoted to Engineering Manager and
46
47 assumed responsibility for a wide variety of fossil and
48
49 nuclear power projects including Arkansas Nuclear One Project
50
51 Units 1 and 2, Pilgrim Station Units 1 and 2, the Palisades

1 retrofit, the Big Rock Point fuel pool liner and Humboldt
2 Bay Unit 3 modifications. I became Manager of Engineering
3
4
5 for Bechtel Power Management in 1976. In this capacity, I
6
7 was responsible for the establishment of engineering policy,
8
9 standards and procedures; effective use of human and technical
10
11 resources; maintenance of technical leadership; and representa-
12
13 tion of the engineering functions to clients, industry and
14
15 regulatory agencies. In 1978, I assumed the Project Manager
16
17 position on the Vogtle Nuclear Plant where I was responsible
18
19 for engineering, design, procurement, planning, staffing,
20
21 cost, schedule and startup support.
22
23

24
25 I was transferred to the STP as Project Manager in
26
27 February 1982.
28

29 (JC): I graduated from the United States Merchant
30
31 Marine Academy in 1946, completing the marine engineering
32
33 curriculum. This included all the engineering credits later
34
35 required for a B.S. Degree in marine engineering. I am
36
37 a licensed Professional Engineer in Nuclear Engineering
38
39 in the State of California.
40

41 From 1946 to 1953, I held various positions in power
42
43 plant operations with the Matson and Moore-McCormick Steamship
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45 companies, Army Chemical Center and in the United States
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47 Navy as a submarine officer. From 1953 to 1966, I was
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49 employed by the General Electric Company in the Operations
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5 Department of the Knolls Atomic Power Laboratory, which was
6 engaged in the development, construction, and testing of
7 Navy nuclear power plants. I was promoted to Operations
8 Manager in 1956. In this capacity, I was responsible for
9 construction completion, startup activities, and test opera-
10 tions of four land based full scale nuclear propulsion
11 plants for use by the U.S. Navy.
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18 I joined the General Atomic Company, which was involved
19 in high temperature gas cooled reactor design and construc-
20 tion, in 1966 as a Purchasing Staff Engineer. I later held
21 positions as Manager in the Cost Engineering, Project Develop-
22 ment and Purchasing Departments. I became Project Manager
23 of the Ft. St. Vrain Project in 1973, where I had overall
24 responsibility for construction management. I was promoted
25 to Director, Services and Construction in 1975, where I was
26 responsible for development of construction methods and
27 practices, operator training, and startup testing for high
28 temperature gas reactor plants.
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38 I was employed again by the General Electric Company,
39 Nuclear Power Division from 1976 to 1978 as Manager, Valve
40 Design.
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43 I came to Ebasco in March 1978 as Site Manager for the
44 Waterford Unit 3 Nuclear Project, where I was responsible for
45 the administration of all onsite activities, supervision of
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5 Ebasco site personnel, establishment of equipment and facil-
6 ities requirements and overall responsibility for construction
7 costs and schedule progress. I became an Assistant Construc-
8 tion Manager assigned to the Ebasco New Orleans Regional
9 Office in November 1980.
10
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12

13
14 Q.3. Panel, what is the purpose of your testimony?
15

16 A.3. (JG, BL, JC): The purpose of our testimony is to
17 describe the transfer of STP architect/engineer and construc-
18 tion management responsibilities from Brown & Root, Inc.
19 (B&R) to Bechtel and construction responsibilities to Ebasco;
20 the organization and staffing of Bechtel and Ebasco for
21 their respective responsibilities; and the relationship
22 among HL&P, Bechtel and Ebasco for the design and construc-
23 tion of STP.
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31 Q.4. Mr. Goldberg, please summarize HL&P's decisions to
32 replace B&R as architect-engineer, construction manager and
33 constructor.
34

35 A.4. (JG): By early summer of 1981, HL&P had concluded
36 that B&R lacked the necessary depth to perform the engineering
37 and construction management tasks for STP in an orderly,
38 timely and cost effective manner. We were concerned about
39 B&R's lack of engineering progress which was holding back
40 construction, thereby affecting Project costs and scheduling.
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5 Accordingly, we undertook to examine the feasibility of
6 replacing B&R as AE and construction manager with an organiza-
7 tion which had the nuclear experience and resources necessary
8 to assume architect-engineering and construction management
9 responsibilities for a job of this magnitude. We received
10 and evaluated proposals during August and early September,
11 and determined that Bechtel, which has, by far, engineered
12 and built more nuclear power facilities in the U.S. than any
13 other organization, was the best choice. An important factor
14 was the enormous technical resources that Bechtel was willing
15 and able to commit to the Project.

16
17 We were able to reach agreement in principle with
18 Bechtel by September 24, at which time we announced our
19 intention to reallocate responsibilities from B&R to Bechtel.

20
21 At that time, B&R was progressing satisfactorily in
22 implementing needed improvements in its construction activi-
23 ties. Although we were concerned as to its ability to
24 complete the engineering and to manage the overall con-
25 struction effort in a cost effective manner, these concerns
26 did not extend to B&R's actual construction work. Thus, we
27 did not plan to replace B&R as constructor and, in fact,
28 requested B&R to continue in that capacity at STP.
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5 However, in November B&R notified HL&P that it would
6 not serve as constructor and that it intended to withdraw
7 from the Project. HL&P instituted a search for a new con-
8 structor and evaluated a number of firms. On February 15,
9 1982, we announced the selection of Ebasco. Ebasco also
10 brings to the Project a wealth of nuclear experience, including
11 participation as constructor or construction manager of 17
12 nuclear power plants.
13

14 Q.5. Mr. Lex, what are Bechtel's qualifications for
15 performing its responsibilities as architect-engineer and
16 construction manager for STP?
17

18 A.5. (BL): As summarized in the information submitted
19 to the NRC on December 11, 1981 (Applicants' Exh. 52),
20 Bechtel's qualifications include more than 30 years of
21 experience in the nuclear industry. We have participated in
22 the design, engineering and/or construction of 91 nuclear
23 facilities in the United States and worldwide. The total
24 capacity of the power projects is in excess of 78,000 megawatts
25 and includes nearly all types of reactor design and power
26 concepts.
27

28 Bechtel's major engineering experience within the past
29 decade includes 50 nuclear power units with a total capacity
30 of 51,000 MW. Major power plant construction, construction
31 supervision, and construction management experience within
32

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5 the past decade includes 41 nuclear power units with a total
6 capacity of 43,000 MW. This effort is carried out through
7 four divisions which are coordinated through Bechtel Power
8 Corporation Management Staff.
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11
12 Bechtel's engineering experience has resulted in cor-
13 porate development and NRC approval of twelve topical reports.
14 These reports establish methods for the design of important
15 features of nuclear power plants including pipe break effects,
16 subcompartment pressure analysis, Quality Assurance (QA),
17 etc. Bechtel also maintains a corporate engineering staff
18 (Bechtel Power Management) to coordinate solutions to and
19 provide experience from within the corporation to focus on
20 difficult or generic engineering problems, and to alert the
21 projects relative to actions necessary to resolve such
22 problems. Feedback from operating plants and plants under
23 construction is also disseminated through this organization.
24
25

26 Throughout Bechtel, senior staff personnel coordinate
27 the flow of information between projects in all offices.
28 This results in a systematic review of engineering and
29 design information, evaluation and dissemination of licensing
30 information to individual projects, development of company
31 positions on issues, and coordination with the regulatory
32 agencies on generic matters.
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5 Q.6. Mr. Crnich, what are Ebasco's qualifications for
6 performing its responsibilities as constructor for STP?
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8 A.6. (JC): As summarized in the information submitted
9 to the NRC on March 15, 1982 (Applicants' Exh. 53), Ebasco
0 has more than 20 years of experience in the nuclear industry.
1 We have participated in the design, engineering, and/or
2 construction of 30 nuclear facilities in the United States
3 and worldwide. The total capacity of these projects is in
4 excess of 20,000 megawatts and includes every type of reactor
5 design in commercial use in the U.S.
6

7 Ebasco has been the constructor or construction manager
8 at 17 nuclear units. We have served as constructor where
9 another company was architect/engineer (Ft. St. Vrain), and
0 have taken over construction management where work was
1 started by others (Laguna Verde).
2

3 Construction is carried out through an onsite organi-
4 zation under the Ebasco Construction Manager, who reports to
5 the Vice President, Construction at Ebasco's New York cor-
6 porate headquarters. The duties of the New York Office
7 construction staff include the gathering and dissemination
8 of construction experience from Ebasco and other plants.
9 This assures that the STP project will benefit from con-
0 struction experience at other sites.
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5 Q.7. Mr. Lex, please describe the Bechtel organization
6 structure for performing its responsibilities for STP.
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9 A.7. (BL): Bechtel began its activities relating to
10 the assumption of architect-engineer and construction manage-
11 ment responsibilities for STP in October 1981. The objective
12 of these initial activities was to plan a comprehensive
13 assessment of the status of the Project and the development
14 of a program necessary to carry it to successful completion.
15 This transition program for Bechtel's assumption of its
16 responsibilities and Bechtel's organization for initiating
17 its implementation were generally described in the Transition
18 Program Description (Applicants' Exh. 54). Our major current
19 activities are associated with the transition tasks, and the
20 task groups that began these activities continue to carry
21 out these assignments. Our organization has now evolved to
22 the structure planned for continuation of the Project and
23 most of the key positions have been filled.
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37 Figure 1 attached to this testimony describes the
38 current organization which is completing the transition and
39 will carry the Project forward.
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41 As can be seen from Figure 1, engineering and procure-
42 ment functions are consolidated under the direction of an
43 Assistant Project Manager. Within the engineering team, the
44 personnel under the overall direction of the Project Engineering
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5 Manager are reorganized into three multi-disciplinary design
6 teams, each headed by a Project Engineer and charged with
7 the responsibility for defined portions of the engineering
8 work. We are also adding a Project Resident Engineer at the
9 site, reporting to the Project Engineering Manager, to
10 provide coordination between the Design Office engineering
11 team and the field organization. The procurement team,
12 which is unchanged from the initial transition organization,
13 is headed by the Project Procurement Manager.
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21 The construction management team, under the direction
22 of the Manager of Construction, remains essentially unchanged
23 from the initial program, except for the elimination of the
24 Construction Management Survey Team and of the Manager of
25 the Fabrication Shop, neither of which are needed any longer.
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31 Administrative and cost/schedule functions are con-
32 solidated under the direction of an Assistant Project Manager,
33 who oversees the Project Cost/Schedule Manager, the Project
34 Administrative Services Manager and the Project Information
35 Services Manager. A Project Administrative Manager and the
36 Records Management System Manager will report to the Project
37 Administrative Services Manager. The Project Information
38 Services Manager will direct the on-project data processing
39 services support group.
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5 Two new Project Management positions have been added, a
6 Project Licensing Manager who is responsible for overall direc-
7 tion of Bechtel's support of the STP licensing activities,
8 and a Strategic Planning Manager who will direct programs
9 for incorporating constructability considerations into the
10 final design and for long-range planning of construction
11 methods and sequences.
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18 Q.8. Mr. Crnich, please describe the Ebasco organizational
19 structure for performing its responsibilities for STP.
20

21 A.8. (JC): The Ebasco Construction Manager, who reports
22 to the Ebasco Vice President, Construction, is responsible
23 for all Ebasco activities at STP, with the exception of the
24 technical direction of the Quality Program. He is respon-
25 sible for providing the leadership necessary to develop,
26 integrate, and maintain a dynamic and cohesive construction
27 team of experienced and qualified personnel. He provides an
28 onsite Ebasco executive presence, as he is authorized by
29 Ebasco to act on its behalf in directing affairs at STP.
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38 The Site Manager reports directly to the Ebasco Construc-
39 tion Manager. He is accountable for all the day-to-day
40 construction activities, including quality, cost, and schedule
41 of work. He directs and coordinates all onsite activities,
42 including staff management and mobilization of field payroll
43 non-manual staff. As shown on attached Figure 2, key individuals
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5 reporting to the Site Manager are the two Project Superin-
6 tendents (Units 1 and 2), the Senior Resident Engineer and
7 the Construction Control Superintendent. Also reporting to
8 the Site Manager are the Labor Relations Representative,
9 Safety/Fire Prevention Representative, and the Administration
10 Manager. As noted in the testimony of Mr. Hawn, the Quality
11 Program Site Manager coordinates with the Site Manager to
12 assure communication and administrative continuity.
13

14 The Project Superintendents are responsible for the
15 completion of construction activities at their assigned
16 units. They administer the detailed execution of schedules
17 for the activities of construction manpower and equipment
18 and plant systems completion, and have the authority and
19 responsibility for their implementation. They are responsible
20 for safe work practice, fire prevention activities, coordina-
21 tion with the Construction Control Superintendent in the
22 development of plans and schedules, and the review of work
23 progress, techniques and procedures being implemented.
24

25 The Senior Resident Engineer is responsible for the
26 field engineering review of drawings and specifications, for
27 preparation of construction procedures and other field
28 documents, for establishing and maintaining a control system
29 for controlled documents used by Construction and for resolving
30 field engineering problems and recommending solutions to
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5 Bechtel. He is also required to provide technical support
6 to the Area Superintendents and to provide the technical
7 interface to the Bechtel engineering group. In addition, he
8 provides field survey crews to support Construction.
9

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11
12 The Construction Control Superintendent is responsible
13 for providing to Bechtel quantity tracking and schedule
14 related information and any required quantity/manpower
15 reports related to construction activities. This is done by
16 producing quantity reports, schedules, material tracking
17 reports, production and productivity reports, forecasts and
18 trend analyses and other studies or analyses as required to
19 support Bechtel's overall construction plan.
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27 Q.9. Mr. Goldberg, since the last time that you testified,
28 have there been any changes in HL&P's organization?
29

30 A.9. (JG): Yes. There has been a realignment of
31 organization responsibilities within HL&P in order to
32 consolidate the nuclear program engineering and construction
33 activities under my direction. This "dematrixing" took
34 place during the fall of 1981.
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40 The current STP organization is shown in attached
41 Figure 3. The previous organization was essentially divided
42 into two major sections. Houston based activities reported
43 to the Manager, Houston Operations, and site-related activities
44 reported to the Site Manager. In our revised organization,
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5 the Manager, Engineering reports directly to the Project
6 Manager. Another important activity which needed more
7 visibility on this Project is records management and infor-
8 mation processing. We have assigned a Manager to supervise
9 the staff and to develop a comprehensive records management
10 plan. These two changes are the major differences between
11 HL&P's Project organization of May 1981 and the Project
12 organization today.
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20 As a result of this reorganization and the addition of
21 more experienced personnel, we have been able to reduce the
22 total number of professional personnel. Since all personnel
23 are dedicated to one project, they can work free from interrup-
24 tions due to secondary home office responsibilities. This
25 increased efficiency has been enhanced by the addition of a
26 number of seasoned personnel in Engineering.
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32 We will continue to upgrade our experience in the
33 coming months.
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36 We have also established an Engineering Assurance
37 Department under my direction whose function will be to
38 oversee a selective independent review of the design and
39 engineering effort on HL&P's nuclear projects.
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43 Q.10. Please identify the major activities involved in
44 transferring responsibilities at STP from B&R to Bechtel and
45 Ebasco.
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5 A.10. (JG): The Transition Program Description filed
6 with the NRC on December 11, 1981, generally describes the
7 activities involved in transferring responsibilities from
8 B&R to Bechtel as architect-engineer and construction manager.
9 These include the detailed reviews of engineering, construc-
10 tion and procurement which will be discussed below by Mr. Lex.
11 In addition, he will describe Bechtel's preparation for the
12 assumption of its responsibilities as architect/engineer and
13 construction manager.
14
15

16 Ebasco has begun to develop the procedures and assemble
17 the staff required for the discharge of its responsibilities
18 as constructor. These are discussed below by Mr. Crnich.
19
20

21 The activities involved in preparing and implementing
22 the revised QA program applicable to the STP are described
23 in the separate testimony to be presented by Messrs. Geiger,
24 Krishna and Hawn.
25
26

27 Finally, I will describe the steps taken by HL&P to
28 assure itself that appropriate measures are included in the
29 transition program to achieve an effective transfer of
30 responsibilities, that they are implemented properly, and
31 that design and construction activities will resume satis-
32 factorily.
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35 Q.11. Mr. Lex, please describe the program for Bechtel's
36 assumption of responsibility as architect/engineer.
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5 A.11. (BL): As described in the Transition Program
6 Description, Bechtel is performing a review of the total
7 plant design. As a first step in performing this review,
8 the design has been segregated into discrete groupings
9 called "work packages" which can be effectively reviewed as
10 individual tasks. A work package is an assemblage of docu-
11 ments which describes the design, scope and the extent of
12 completion of the engineering. Each work package is evaluated
13 to assess the status and adequacy of the design, including
14 its interfaces with other elements of the plant design.
15
16

17 Bechtel reviewed the basic STP documentation to deter-
18 mine the general status of design and to identify the break-
19 down into work packages. From this review, approximately 150
20 work packages were initially identified, as listed in the
21 Transition Program Description. These include discrete work
22 packages covering systems, structures, and major components.
23 Taken together the work packages address the entire plant
24 scope. The list of work packages has changed as the review
25 has progressed, since some of the packages have been com-
26 bined and several have been divided.
27
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29 Each work package consists of the documents necessary
30 to described the defined work and includes, as appropriate:
31 system design criteria, system description, piping and
32 instrumentation diagrams, loop diagrams, logic diagrams,
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5 flow diagrams, equipment specifications, equipment sizing
6 calculations, vendor drawings, special calculations, isometric
7 drawings, etc. B&R is providing the foregoing data utilizing
8 a further subdivision of the work into distinct subpackages.
9

10
11
12 System work packages are concerned with a single process
13 system, a single structure, or several related structures.
14

15 Examples of system work packages include:
16

- 17 - Fuel handling building
- 18 - Plant security system
- 19 - Condensate storage tank
- 20 - Essential cooling pond
- 21 - 480 V auxiliaries power distribution
- 22 system
- 23 - Auxiliary feedwater system
- 24 - Station heating, ventilation and air
- 25 conditioning system
- 26 - Fire protection system
- 27 - Containment spray system

28
29 In addition to the system work packages, there are also
30 the following work packages which address interdisciplinary
31 matters that are involved with many different systems or
32 structures:
33

- 34 - Systems interaction and integration
 - 35 - Licensing document review
 - 36 - Line break criteria and analysis
- 37
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- Pressure transient analysis
- ALARA and shielding criteria
- Environmental qualification
- Safe shutdown criteria
- Implementation of post-TMI concerns
- Classification of equipment and structures
- Incorporation of NRC bulletins and generic letters
- NRC unresolved (generic) safety issues
- Quadrex issues
- Protection against natural phenomena and external hazards.

The process of review and evaluation varies according to the nature of the work under review. Engineering evaluates the design assumptions and methods of analysis; determines whether the design satisfies the applicable criteria and addresses the necessary technical requirements; reviews design interfaces with vendor supplied equipment and design work of other disciplines; checks for proper reference to computer output; assesses the adequacy of design verification; reviews the design drawings, and determines if specifications and drawings are up to date.

The result of review of each work package will be documented in a report to HL&P and Bechtel Management. The report will present:

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5 (1) a brief summary of the work covered by the
6 package;

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9 (2) current status of engineering, design, documen-
10 tation and licensing including any applicable 10 CFR
11 Section 50.55(e), 10 CFR Part 21, or Quadrex concerns;

12
13 (3) any recommendations for remedial actions;

14
15 (4) any unresolved items;

16
17 (5) a summary of work to go, plan for transfer of
18 remaining work, and statement of work which may require
19 other organizations' participation;

20
21 (6) a list of related work packages; and

22
23 (7) any additional references, assumptions or
24 special conditions.

25
26 The report for each work package will be prepared in
27 draft form, and Bechtel will solicit verification of facts
28 presented in the draft from B&R, to the extent possible, and
29 HL&P. Comments generated in the review process will be re-
30 solved and incorporated, as appropriate, into the final
31 report.

32
33 Once HL&P accepts a final report, a set of reproducible
34 quality work package documents, including the final report,
35 will be assembled for retention as Project records. Activi-
36 ties or items of work to be performed, including any correc-
37 tive actions, unresolved issues, and other activities not
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5 normally included in Project schedules or work plans, will
6 be identified as action items in the final report. Assignment
7 of responsibility for each action item will be made by
8 Bechtel Engineering and a Master Actions Items List will be
9 maintained for the Project.
10
11

12 The extent to which the Bechtel engineering work may
13 repeat previous B&R design effort will depend on the com-
14 pleteness and clarity of the B&R documentation. Where there
15 is sufficient evidence of the completeness and adequacy of
16 calculations, design verifications and other design activities
17 performed by B&R, the previous work will be accepted. If
18 there are instances where that is not the case, specific
19 aspects of the work will be identified for further engineering
20 action as part of the post-transition activities. In short,
21 Bechtel Engineering will perform the design reviews necessary
22 to satisfy Bechtel of the adequacy of the work so that it
23 can be relied upon for use in future design.
24
25

26 Q.12. Please describe the program for Bechtel's assumption
27 of responsibility as construction manager.
28
29

30 A.12. (BL): Bechtel's responsibility as construction
31 manager for STP includes the following principal jobsite
32 functions:
33

- 34 - Overall direction of construction.
- 35 - Overall construction planning.
- 36
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- Overall construction cost control program (Ebasco will be responsible for timekeeping and quantity reporting).
- Summary and intermediate level scheduling (Ebasco is responsible for detail, daily, weekly, monthly scheduling).
- Area management, which includes providing direction and control to Ebasco's area and discipline superintendents (craft supervision is the responsibility of Ebasco).
- Field engineering, which includes providing technical direction to Ebasco's field engineers, resolving specific design problems through interface with Bechtel Project Engineering and approving the work plans and procedures of Ebasco and other contractors.
- Purchasing of all field procured permanent plant material and approval of Ebasco's purchase orders for non-permanent materials and supplies.
- Site document control (Ebasco will be responsible for control and distribution outside the Document Control Center).
- Contract administration, which includes formulating and administering all jobsite contracts.
- Safety/construction fire protection, which includes monitoring the safety/fire protection programs in order to ensure that contractual obligations are fulfilled.
- Training, which includes the overall direction of the jobsite training and detailed training of Bechtel personnel.

- Receiving and warehousing of permanent plant material (Ebasco will provide the labor for receiving and warehousing).

Bechtel's principal construction management activity during the transition has been to conduct a series of evaluations to determine the status of construction. Emphasis has been placed upon quality-related aspects of the work, with cost and schedule also being considered.

The construction management transition activities consist of work in nine major areas:

- Management of the site maintenance and caretaking
- Statusing of the existing construction
- Statusing of all material on the jobsite
- Evaluation of construction facilities
- Review of existing subcontracts.
- Development and implementation of the site safety and fire protection programs
- Development of general construction procedures
- Development of training programs
- Initiation of construction planning

Reports of findings and recommendations are being provided as individual tasks are completed. Results of these activities will be used in planning future activities.

Q.13. Please describe the program for Bechtel's assumption of responsibility for managing procurement activities.

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5 A.13. (BL): During the transition, Bechtel Procurement
6 is reviewing the status of purchased items to determine
7 their conformance to the procurement document requirements.
8 (Engineering is concurrently reviewing the procurement
9 requirements to determine their adequacy). Primary emphasis
10 is on the qualifications of the suppliers to meet the require-
11 ments of the Project, and on assuring that the documentation
12 provided meets the applicable Project requirements. In
13 addition, Bechtel Procurement is statusing items delivered
14 to the jobsite, still in fabrication, and yet to be ordered.
15 Particular attention is being given to the safety-related
16 components to verify that the required inspections and tests
17 are being completed in accordance with approved procedures.

18
19 . Procurement work packages are assembled from B&R docu-
20 ments and reviewed by the appropriate sections of Bechtel
21 Procurement. These reviews are coordinated with Bechtel
22 Engineering.

23
24 A report covering all Procurement input on purchase
25 orders associated with each work package will be included in
26 the Engineering Report for the work package. The Procurement
27 input to these Reports will contain the results of the
28 Procurement review and any recommended changes and/or correc-
29 tive actions.
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5 All future Design Office procurement functions associated
6 with the Project will be managed by the Project Procurement
7 Manager, who reports to the Project Manager for operational
8 direction and to the Division Procurement Manager for func-
9 tional direction. These functions include purchasing,
10 expediting and supplier surveillance. In addition to managing
11 all Design Office procurement activities, the Project Procure-
12 ment Manager is responsible for the coordination of interrelated
13 activities of the Field Procurement group, which receives
14 operational direction from the Project Manager of Construction.
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23 The Contracts/Purchases staff on the Project will
24 develop and administer all Design Office initiated purchase
25 contracts issued for permanent plant material and equipment.
26 The Project Expediting group will assure that goods con-
27 tracted for are delivered to the jobsite to support the
28 construction schedule. Bechtel's Procurement Supplier
29 Quality (PSQ) Department will perform surveillance and
30 audits of suppliers to provide an added degree of confidence
31 that purchased items comply with the requirements contained
32 in the contract documents. Further discussion of the PSQ
33 Program is provided in Mr. Krisha's testimony.
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44 Q.14. Please describe other major activities being
45 conducted by Bechtel in assuming its responsibilities for
46 STP.
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5 A.14. (BL): In addition to QA, engineering, construction
6 management and procurement activities, other Bechtel activi-
7 ties involve Project administration and cost/schedule.
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10 Principal transition activities in Project adminis-
11 tration include preparation for assumption of Bechtel's
12 responsibilities with respect to document control and records
13 management. Project administration is also coordinating the
14 development of the Bechtel Project procedures. This involves
15 organizing and integrating standard Bechtel practices into a
16 specific Project program that incorporates the commitments
17 and relationships of Bechtel to HL&P, Ebasco, Westinghouse
18 and other contractors.
19
20

21 In cost/scheduling, systems are being prepared to
22 control Project cost and schedule. Material control ledgers
23 are being prepared for tracking current and future status.
24 Development of Project cost and schedule estimates is also
25 underway leading to an updated Project forecast in July 1982.
26
27

28 Q.15. Please describe how controls, standards and procedures
29 developed through Bechtel's previous nuclear experience are
30 being utilized in planning and performing its work at STP.
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33 A.15. (BL): Bechtel will carry out the work using our
34 proven practices developed as a result of the experience
35 gained by participation in 91 major nuclear projects.
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5 These practices include technical controls such as:

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7 - Complete control of the design by
8 the Project Engineering team, including
9 review and approval of proposed
10 changes by construction or suppliers.
11
12 - Design control and verification
13 practices, which have been proven on
14 a number of current nuclear projects.
15
16 - Independent Project QA reporting to
17 Bechtel management above the Project
18 management.
19
20 - Independent supplier source surveil-
21 lance inspection by the Bechtel
22 Project Supplier Quality Department.
23
24 - Independent construction site QA and
25 QC functions reporting to Bechtel
26 Management above both site and Project
27 management.
28
29 - Construction management practices
30 proven on a number of domestic and
31 overseas projects.

32
33 Future engineering will utilize, as appropriate, the
34 Bechtel Engineering Standards. These are a set of engineer-
35 ing rules, principles, criteria, standards, drawings and
36 specifications developed for each engineering discipline.
37 These standards help to bring Bechtel's extensive nuclear
38 and general engineering experience to bear in the engi-
39 neering of each project.
40

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42 Bechtel will also utilize its Engineering Department
43 Procedures as modified for Project unique requirements.
44 These procedures define the requirements to ensure uniform
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5 methods of conducting work activities of the Engineering
6 Department, explain the relationships and responsibilities
7 necessary to accomplish work activities, etc.
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9

10 Similarly, through its years of experience in the
11 construction and construction management of nuclear projects,
12 Bechtel has developed procedures and instructions to control
13 work in the field. These are being employed in the develop-
14 ment of the specific procedures that will be used at STP.
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19 Q.16. Please provide an estimate of the expected Bechtel
20 staffing levels for STP and describe the experience (including
21 nuclear) of assigned Bechtel personnel.
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25 A.16. (BL): Apart from the staffing of Bechtel's QA
26 functions, which will be discussed by Mr. Krisha, our prelimi-
27 nary estimate is that Bechtel staffing levels will be approxi-
28 mately 500 professionals in Engineering, 400 professionals
29 in Construction Management and 150 professionals on the
30 balance of the Project team.
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36 The senior Bechtel line management personnel assigned
37 to the STP have extensive power plant engineering and con-
38 struction experience, much of which is in nuclear projects.
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41 I report to Mr. D. W. Halligan who is a Vice President
42 of Bechtel and Project Executive Director for the South
43 Texas Project. Mr. Halligan has 28 years of engineering
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5 experience, including 20 years on nuclear projects. His
6
7 assignments with Bechtel have included positions on a number
8
9 of nuclear power projects, such as Project Engineer for the
10
11 Palisades Nuclear Project and Project Manager for the Fast
12
13 Flux Test Facility. Most recently he served as Deputy
14
15 Division Manager of the Bechtel San Francisco Power Division,
16
17 in which position he had a leadership role in planning
18
19 Bechtel's assumption of construction management responsibility
20
21 for the WPPSS Units 1, 2 & 4. Mr. Halligan received a
22
23 Bachelor of Science degree in Civil Engineering at Oregon
24
25 State University and a Master's degree from Stanford University.
26
27 He is a Registered Professional Engineer in the states of
28
29 California, Washington, Maryland, Minnesota, Massachusetts
30
31 and New York.

32
33 The Assistant Project Manager-Engineering and Procure-
34
35 ment is Mr. E. A. Rumbaugh. Of Mr. Rumbaugh's 25 years of
36
37 engineering experience with Bechtel over 20 have been in the
38
39 nuclear area. This has included positions as Project Engineer
40
41 on the Palisades Plant, the Pilgrim Nuclear Power Station,
42
43 and the Quanicassee Nuclear Plant. He has served as Chief
44
45 Mechanical Engineer and Engineering Manager in Bechtel's Ann
46
47 Arbor office and comes to the STP from the position of
48
49 Manager of Division Engineering in Bechtel's Ann Arbor Power
50
51 Division. He holds a Bachelor of Science in Mechanical

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5 Engineering degree from the University of California at
6 Berkley and is a Registered Professional Engineer in the
7 states of Iowa, California, New York and Michigan.
8
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0 The Project Engineering Manager is R. L. Rogers who has
1 17 years of nuclear engineering experience, including 6 years
2 in the nuclear navy. Prior to assuming his responsibilities
3 at the STP, Mr. Rogers was Project Engineer for Bechtel on
4 the San Onofre Nuclear Generating Station, Units 2 & 3. His
5 previous experience with Bechtel has included engineering
6 assignments on the Rancho Seco Unit 1, the Vogtle Nuclear
7 Plant, and San Onofre Unit 1. He is a graduate of the
8 University of Kansas with a Bachelor of Science degree in
9 Mechanical Engineering and received training at the United
0 States Navy Advanced Nuclear Power School, Nuclear Power
1 Training Unit, and Submarine School. He is a Registered
2 Professional Engineer in the state of California.
3
4

5 The Manager of Construction, B. R. McCullough, has
6 25 years experience with Bechtel, 10 of which have been in
7 the nuclear field. His experience included serving as Field
8 Construction Manager on the San Onofre Nuclear Generating
9 Station, Units 2 & 3, and most recently as Manager of Con-
0 struction of Nuclear Facilities for Bechtel's Los Angeles
1 Power Division, where he had responsibility for the construc-
2 tion of San Onofre Units 1, 2 & 3, and the Palo Verde Nuclear
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5 Generating Station, Units 1, 2 & 3. He has a Bachelor of
6 Arts degree in Industrial Engineering.
7

8 The Project Procurement Manager, Bryce F. Robertson,
9 has approximately 12 years experience in Bechtel Procure-
10 ment. His assignments have included work as Architectural
11 Supplier Quality Representative/Expeditor, Supervisor of
12 Inspection and Expediting for Bechtel Pacific's Melbourne
13 Office, Procurement Supplier Quality Supervisor for all
14 Bechtel non-power divisions, and Procurement Supplier Quality
15 Representative for Field Services for Bechtel in San Francisco.
16 Most recently he served 2-1/2 years as Manager of the Procure-
17 ment Supplier Quality Department in Bechtel's Los Angeles
18 Power Division.
19

20 As of the first week of February, approximately 422
21 professional Bechtel personnel (outside of QA) had been
22 assigned to STP. Their total professional experience is
23 5497 man-years (an average of 13 years per person), in-
24 cluding a total of 2306 man-years of nuclear experience (an
25 average of 5-1/2 years per person).
26

27 It is expected that over 70 percent of the foregoing
28 personnel will remain with the Project after transition
29 activities are completed, and that the experience of Bechtel
30 personnel subsequently assigned to the Project will be
31 comparable.
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5 Q.17. Mr. Crnich, please describe Ebasco's responsibilities
6 as constructor.
7

8 A.17. (JC): Ebasco will supply all labor and supervi-
9 sion to complete the Project through to commercial operations,
10 including the following activities:
11
12

- 13 - Secure ASME certificates.
- 14 - Establish an approved quality program
15 which will satisfy the Project QA commit-
16 ments, including a QC inspection program
17 for safety related work and a construc-
18 tion inspection program for non-safety
19 related work.
20
- 21 - Develop and use work plan procedures and
22 quality inspection procedures which will
23 be approved by Bechtel and also develop
24 procedures for selected complex non-safety
25 related work operations.
26
- 27 - Implement and support Bechtel's Project
28 control programs including cost, schedule
29 and material control.
30
- 31 - Conduct jobsite training for Ebasco's
32 scope of work.
33
- 34 - Purchase, receive and warehouse non-
35 permanent plant material and supplies.
36
- 37 - Implement and control a Project safety
38 and fire protection program and manage
39 and operate the site emergency medical
40 facility.
41
- 42 - Provide a field engineering program with
43 sufficient engineers to support the field
44 activities.
45
- 46 - Perform housekeeping and preventive main-
47 tenance activities, including operation
48 of temporary construction facilities,
49 janitorial service, maintenance of installed
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5 equipment/ vehicles and equipment maintenance,
6 building maintenance, and also provide
7 craft personnel to perform warehouse
8 functions under Bechtel's supervision.

9 Q.18. Please describe how procedures developed through
10 Ebasco's previous nuclear experience are being utilized in
11 planning and performing its work at STP.
12

13 A.18. (JC): Like Bechtel, Ebasco is using procedures
14 which have been developed through many years of experience
15 in construction of nuclear power plants. These construction
16 and QC procedures have proven to be successful at these
17 other nuclear plants. They include procedures for performing
18 and for inspecting both safety-related and non-safety related
19 work, and they clearly define the respective responsibilities
20 of both the construction and QC personnel. The types of
21 construction procedures to be used include Administrative
22 Site Procedures, which establish site organizational respon-
23 sibilities, methods of operation at the site, and document
24 control; Construction Site Procedures, which detail require-
25 ments for specific construction processes; Construction
26 Maintenance Instructions, which detail requirements for
27 maintenance and safeguarding equipment which is under the
28 control of Ebasco; and Inspection Procedures which establish
29 responsibilities and methods of operation to assure that
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1 onsite non-safety-related activities have been satisfactorily
2 accomplished. The QA/QC procedures are discussed in Mr. Hawn's
3 testimony.
4

5 Q.19. Please provide an estimate of the expected Ebasco
6 staffing levels for STP and describe the experience (including
7 nuclear) of Ebasco personnel that will be employed at STP.
8

9 A.19. (JC): From the current level of approximately 50,
10 Ebasco expects to reach a peak level of over 250 professional,
11 supervisory and administrative personnel. The current staff
12 will be steadily increased over the next eighteen (18)
13 months to reach this peak. The key personnel currently on
14 site are senior personnel with many years of construction
15 experience, much of it being nuclear on multiple plants.
16

17 Our Site Manager is Mr. J. A. Thompson. Mr. Thompson
18 has 27 years of construction experience, including 14 years
19 at nuclear projects, such as Millstone Unit 3, Nine Mile
20 Point, River Bend, and St. Lucie Units 1 and 2. He left St.
21 Lucie in 1981 to join B&R as STP Deputy Project Manager.
22

23 The Project Superintendent for STP Unit 1 is Eugene K.
24 Ferguson, who has over 30 years of construction experience,
25 the majority of which is in the area of nuclear and fossil
26 fueled power plants. He has been employed by Ebasco for the
27 past 5 years, including assignments as Deputy Site Manager
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5 for Allens Creek. His prior positions with other architect-
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7 engineers and constructors included construction positions
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9 at Seabrook and Three Mile Island. Mr. Ferguson is a graduate
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11 of the U.S. Merchant Marine Academy, where he studied marine
12
13 engineering.

14 The Project Superintendent for STP Unit 2 is Kenneth H.
15
16 Flanagan, who has over 35 years of construction experience,
17
18 the majority of which is also in the area of nuclear and
19
20 fossil fueled power plants. His assignments at Ebasco
21
22 during the past 13 years have included senior construction
23
24 positions at Waterford Unit 3 and St. Lucie Units 1 and 2.
25
26 His experience at other architect-engineers and constructors
27
28 included duties on the Manhattan Project and at Turkey
29
30 Point.

31 The Senior Resident Engineer is Robert M. Bedford, who
32
33 has over 10 years of power plant construction experience.
34
35 He has been employed for the past 4 years by Ebasco, where
36
37 his most recent assignment was Senior Resident Engineer for
38
39 Allens Creek. His duties at other architect-engineers and
40
41 constructors included construction positions at Seabrook and
42
43 Three Mile Island. Mr. Bedford has a B.S.C.E. from Purdue
44
45 University, is a registered Professional Engineer in Kentucky,
46
47 New Hampshire and Pennsylvania, and is a Surveyor in Pennsylvania.
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5 The buildup of personnel over the next 18 months will
6 utilize primarily experienced personnel coming off the
7 St. Lucie Unit 2 and Waterford Unit 3 nuclear projects which
8 are nearing construction completion.
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12 Q.20. Mr. Goldberg, what steps were taken by HL&P to
13 assure itself that appropriate measures were included in the
14 transition program and that the program was implemented
15 satisfactorily?
16
17

18
19 A.20. (JG): HL&P reviewed and approved the transition
20 program (which is summarized in Applicants' Exh. 54) to
21 assure that it encompassed appropriately all of the major
22 areas of the Project, including engineering, construction,
23 QA, procurement and Project control. This review process
24 involved numerous meetings between senior HL&P personnel and
25 Bechtel. Preliminary work plans and transition schedules
26 were reviewed in depth. The "work package" concept was
27 evaluated and refined to incorporate HL&P's recommendations.
28 Methods for the transfer of engineering data were recommended
29 by HL&P and incorporated into the transition program. HL&P
30 personnel also reviewed the transition procedures utilized
31 by Bechtel, and modifications were made as necessary to
32 reflect Project-specific technical and QA requirements, as
33 well as HL&P's preferences.
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5 HL&P's Project principals in the major areas and their
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7 staffs coordinate transition meetings on specific topics
8
9 between B&R and Bechtel to assure that Bechtel gains a
10
11 thorough understanding of activities conducted by B&R. In
12
13 addition, regular engineering discipline interface meetings
14
15 between HL&P, B&R and Bechtel are held to assure that informa-
16
17 tion is appropriately transmitted, received and understood.
18
19 HL&P management also conducts weekly meetings to monitor the
20
21 status of the transition program and review progress.

22
23 With respect to Bechtel's review of the status of
24
25 engineering, in addition to coordinating and expediting the
26
27 transfer of information from B&R, HL&P's engineering per-
28
29 sonnel review selected work package information as it is
30
31 transmitted by B&R. HL&P also provides technical background
32
33 information to Bechtel and helps answer questions that arise
34
35 during the review. When Bechtel completes its review of the
36
37 work packages covering the systems, structures and compo-
38
39 nents that comprise the Project, HL&P will review and evaluate
40
41 Bechtel's recommendations. Similarly, in other areas, such
42
43 as construction and procurement, HL&P personnel are monitoring
44
45 the progress of Bechtel's transition efforts and assisting
46
47 in their effective implementation.
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5 Q.21. Panel, what are the functional relationships among
6 HL&P, Bechtel and Ebasco in the management and performance
7 of the design and construction of STP?
8
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10 A.21. (JG, BL, JC): The scopes of responsibilities of
11 Bechtel and Ebasco described in our testimony above are
12 clearly defined, and formal lines of communication have been
13 designated to assure appropriate control and coordination of
14 the effort.
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19 Overall Project direction is provided by HL&P to Bechtel's
20 Project Manager. The HL&P Project organizations, including
21 Engineering and Site Management, provide a performance over-
22 view of the corresponding Bechtel Project organizations, and
23 have formal interfaces at the Manager level. For example,
24 the engineering interface is through the HL&P Manager,
25 Engineering and the Bechtel Project Engineering Manager.
26 There is, of course, regular and routine communication among
27 personnel at other engineering levels.
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36 As construction manager, Bechtel directs the activities
37 of Ebasco and performs a QA overview of Ebasco's activities.
38 Except for QA, the construction interface is provided by
39 Bechtel's Manager of Construction and Ebasco's Construction
40 Manager. This interface includes the transmittal of design
41 documents to Ebasco through Bechtel Construction Management.
42 There are also formal interfaces between key personnel in
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5 the Bechtel and Ebasco construction organizations below the
6 Manager of Construction and Construction Manager level. For
7 example, the field engineering interface is through the
8 Ebasco Senior Resident Engineer and the Bechtel Project
9 Field Engineer. In addition, there is a regular and routine
10 communication among Bechtel and Ebasco personnel at various
11 levels.
12

13
14 The relationship among the QA organizations of HL&P,
15 Bechtel and Ebasco is addressed in the testimony of
16 Messrs. Geiger, Krisha and Hawn.
17

18
19 Q.22. In its May 23, 1980 response to a Notice of Vio-
20 lation issued by the NRC, HL&P pointed out that its studies
21 of the underlying causes of then-existing concerns had
22 identified the need for improvement in the following six
23 basic areas:
24

25 (1) translating specifications and job require-
26 ments into clear, simple procedures;
27

28 (2) documenting nonconforming conditions and
29 trending them to identify Project weaknesses;
30

31 (3) training and indoctrination of personnel
32 at all levels regarding the quality program with
33 special emphasis on the Project goals of reliability
34 and safety;
35

36 (4) system controls to assure that quality
37 related activities are initiated, controlled and
38 properly documented;
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5 (5) verifying through an effective audit
6 system adherence to procedures; and

7
8 (6) visibility of, and participation by,
9 upper management in QA activities.

10 Witnesses for Applicants have previously described in
11 this proceeding how these improvements have been implemented
12 for STP. Please describe briefly how present and future
13 activities at STP of HL&P, Bechtel and Ebasco address those
14 six areas.
15
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19 A.22. (JG, BL, JC): In planning for the resumption of
20 construction of STP, Bechtel and Ebasco will be relying on
21 practices that have been employed successfully at other
22 nuclear projects. These practices have effectively addressed
23 the six requirements that are reflected above.
24
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28 Translating specifications and job requirements
29 into clear, simple procedures
30

31 The construction procedures for STP will be drawn from
32 procedures that have been successfully used on other Bechtel
33 and Ebasco nuclear projects, modified to the extent necessary
34 to accommodate specific STP requirements and organizational
35 interfaces.
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40 Documenting nonconforming conditions and
41 trending them to identify Project weaknesses
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43 The documentation of nonconformances and trending are
44 QA functions and are addressed in the testimony of
45 Messrs. Geiger, Krisha and Hawn. As with construction
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5 procedures, the procedures utilized by the QA organizations
6 have been successfully implemented on other Bechtel and
7 Ebasco projects. The trending reports produced by the QA
8 organizations will be sent to each of us and to other members
9 of the senior management of HL&P, Bechtel and Ebasco.
10
11

12
13
14 Training and indoctrination of personnel
15 regarding the quality program
16

17 HL&P, Bechtel and Ebasco each has a program for train-
18 ing and indoctrination of personnel at all levels of the
19 Project regarding the quality program. HL&P has recently
20 created a new training group in its corporate QA organiza-
21 tion to give further emphasis to quality program training
22 and indoctrination. Both Bechtel and Ebasco utilize company
23 wide standard training programs which include emphasis on
24 the unique requirements applicable for nuclear work. As
25 with the procedures, these training programs have been
26 proven effective on other nuclear projects. Perhaps more
27 important than these formal training programs is the selec-
28 tion of qualified supervisory and management personnel. Key
29 personnel on any project greatly affect the degree of personnel
30 awareness and respect for the quality program. As discussed
31 above, both Bechtel and Ebasco are filling these key posi-
32 tions at STP with experienced personnel who have performed
33 well on other nuclear projects.
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5 System controls to assure that quality related
6 activities are initiated, controlled and properly documented
7

8 The system controls incorporated in the procedures
9 utilized by Bechtel and Ebasco have been proven through
10 successful implementation on their other nuclear projects.
11 These procedures are reviewed and audited by the HL&P,
12 Bechtel and Ebasco Project QA organizations to verify that
13 the necessary controls are included.
14

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19 Verifying through an effective audit system
20 adherence to procedures
21

22 As described in detail in the testimony of Messrs. Geiger,
23 Krisha and Hawn, comprehensive audit programs will be imple-
24 mented by all three companies. In addition to planned
25 scheduled audits, when indicated by trend analyses or other
26 conditions, supplemental audits will be performed. HL&P
27 also has adopted a policy of having an annual audit of the
28 Project QA program performed by an independent organization.
29 The findings of the audit programs will be reflected in
30 periodic reports to us and the other members of Project
31 management, and we will each utilize that information to
32 identify aspects of the Project in need of management
33 attention.
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5 Visibility of, and participation by,
6 upper management in QA Activities
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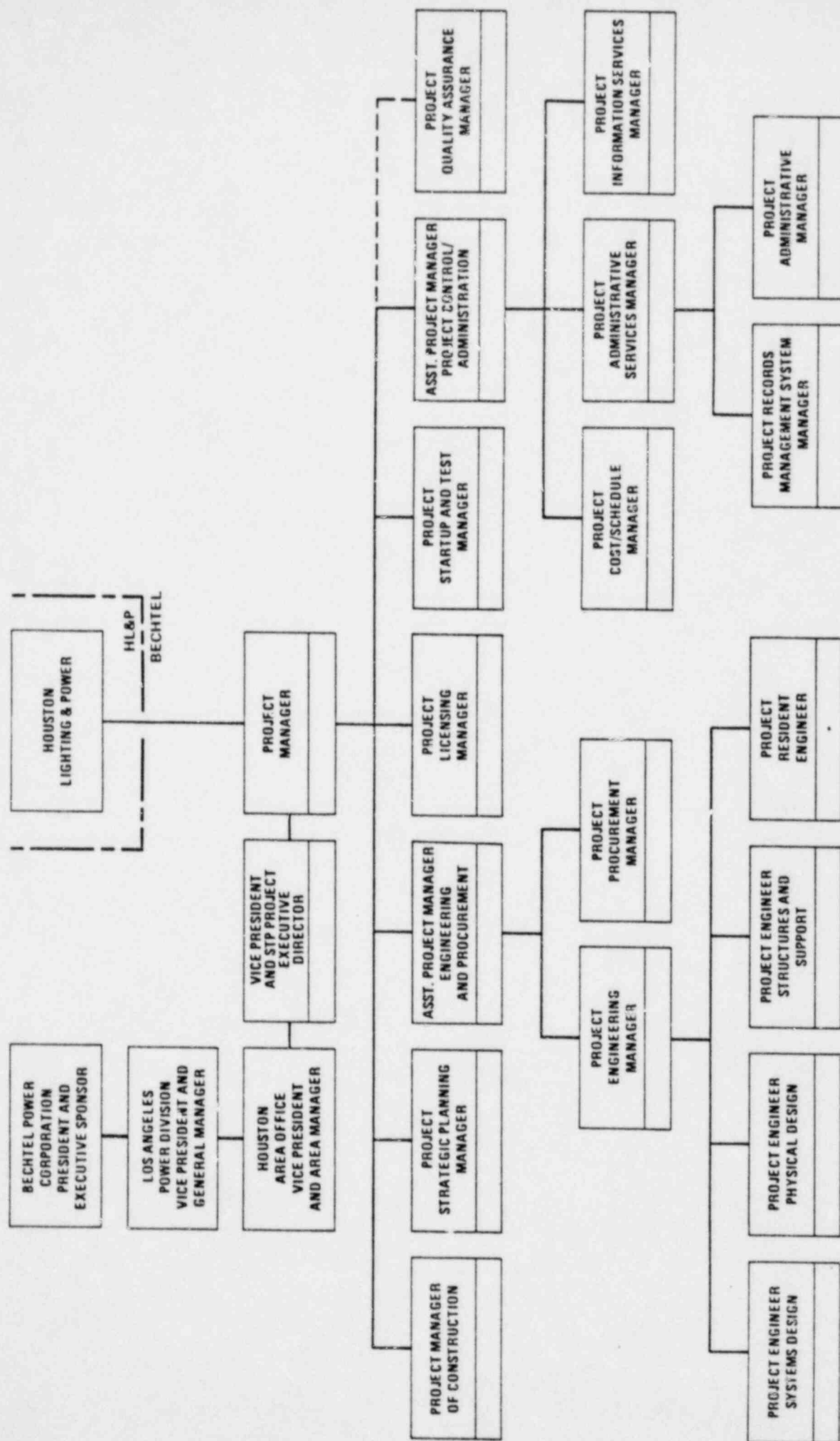
8 Senior management of HL&P, Bechtel and Ebasco are kept
9 informed of the status of the Project QA program through
10 personal briefings and various written reports, including
11 the trending reports and reports of audit findings. In
12 addition, there are periodic inter-company and internal
13 meetings to review Project status, including the status of
14 the quality program. For example, there is a regularly
15 scheduled monthly Project review meeting which is attended
16 by senior management, including Mr. Oprea, Mr. Goldberg, Mr.
17 Halligan, Mr. Lex and key members of their staffs. Issues
18 related to the quality program are frequently discussed at
19 such meetings. Other meetings are held frequently. Within
20 Bechtel there is a monthly quality meeting chaired by the
21 Project QA Manager that is attended by Mr. Halligan and by
22 Mr. Lex and the key members of his Project team. Within
23 Ebasco there are periodic Project status review meetings
24 held at the Ebasco headquarters in New York and attended by
25 Ebasco executives, including Senior Vice Presidents and, at
26 times, the President of Ebasco.
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42 Senior officials within our companies responsible for
43 this Project are taking an active role in the Project.
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5 We are determined to have the Project succeed and management
6 is keenly aware that this hinges on the success of the
7 quality program. That determination is manifested in manage-
8 ment's activities, and we believe, is receiving appropriate
9 visibility on the Project.
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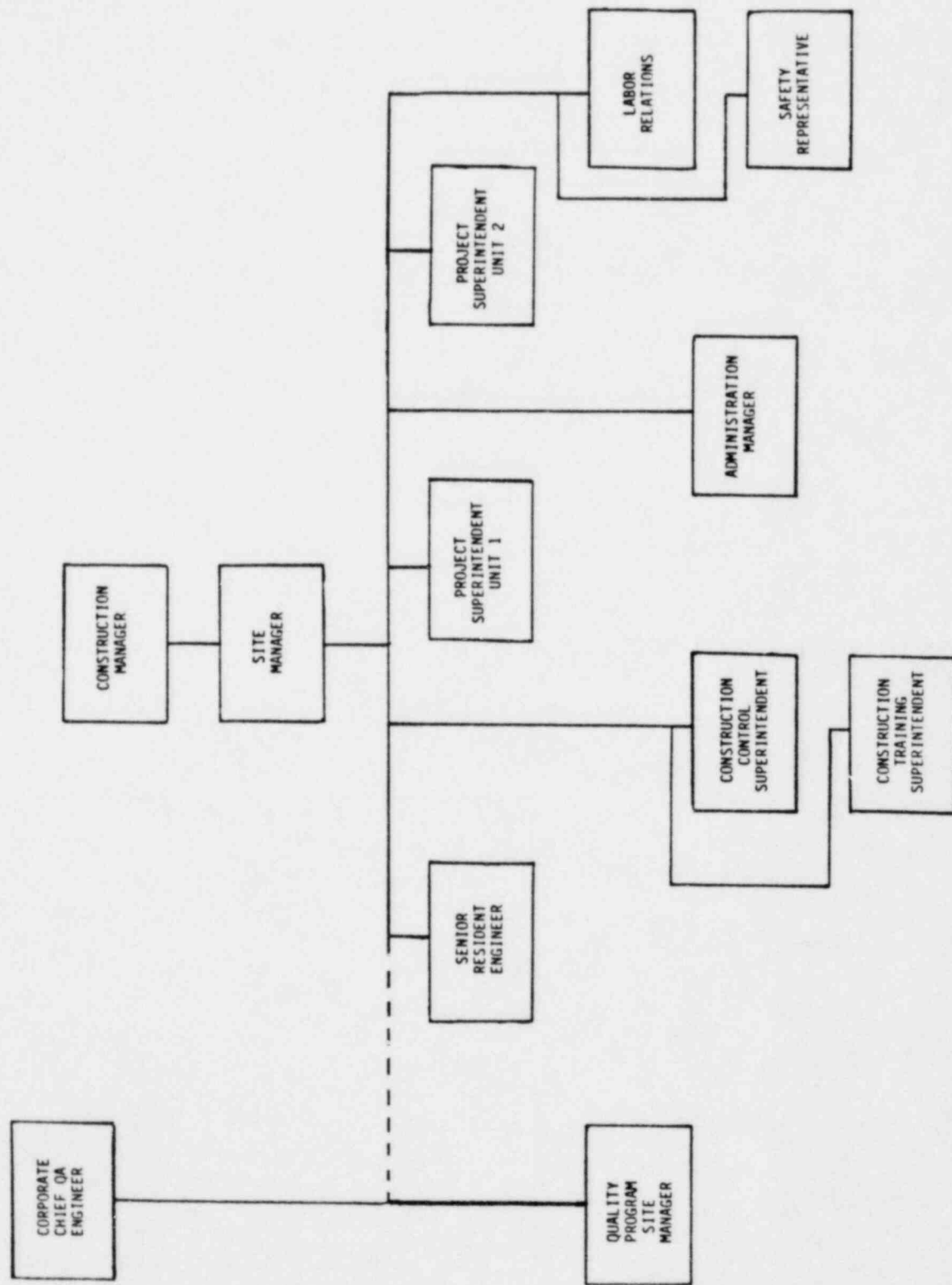
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BECHTEL POWER CORPORATION SOUTH TEXAS PROJECT MANAGEMENT ORGANIZATION FIGURE 1



EBASCO SERVICES INCORPORATED
SITE MANAGEMENT ORGANIZATION

FIGURE 2



HOUSTON LIGHTING & POWER COMPANY
SOUTH TEXAS PROJECT ORGANIZATION

FIGURE 3

