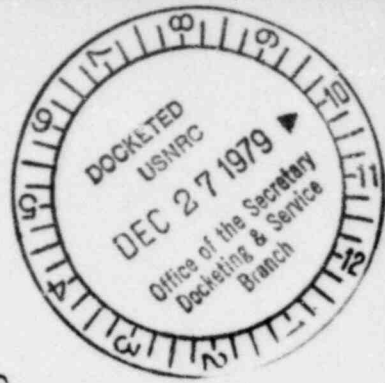


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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

IN THE MATTER OF	§	
	§	
HOUSTON LIGHTING & POWER	§	DOCKET NOS. STN-498 OL
COMPANY, ET AL.	§	STN-499 OL
	§	
(South Texas Project	§	
Units 1 and 2)	§	

APPLICANTS' ANSWERS TO FIRST SET OF
INTERROGATORIES AND MOTION FOR INSPECTION
AND PRODUCTION OF DOCUMENTS BY CITIZENS
FOR EQUITABLE UTILITIES, INC., ET AL.

In response to the First Set of Interrogatories and Motion for Inspection and Production of Documents by Citizens for Equitable Utilities, Inc. and Citizens Concerned About Nuclear Power, Houston Lighting & Power Company, Project Manager of the South Texas Project, acting on behalf of itself and the other Applicants, the City of San Antonio, Texas, acting by and through the City Public Service Board of the City of San Antonio, Central Power and Light Company and the City of Austin, Texas, answer as follows:

INTERROGATORY NO. 1: Provide access to all documents and reports, and the particular parts thereof, relied upon by the Applicant which served as the basis for Section 2.6 in the Final Environmental Statement. In lieu thereof, at Applicants option, a copy of each such document and/or report may be attached to the answer.

ANSWER:

The Final Environmental Statement (FES) was prepared by the NRC Staff and reflects conclusions reached by the Staff as a

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result of its review of Applicants' construction permit application and of independent reference material. Accordingly, Applicants cannot provide a direct response to this interrogatory. To the extent that Applicants have in their possession FES Section 2.6 references, they will be made available for inspection and copying at Houston Lighting & Power Company's Energy Development Complex, 12301 Kurland, Houston, Texas.

INTERROGATORY NO. 2: Provide access to all documents and reports, and identify particular (sic) parts thereof, examined but not relied upon by the Applicant, which pertain to the subject matter questioned above. In lieu thereof, at Applicants option, a copy of each such document and/or report may be attached to the answer.

ANSWER:

As indicated in the answer to Interrogatory No. 1, Applicants did not prepare Section 2.6 of the Final Environmental Statement. Accordingly, Applicants are not in a position to advise as to whether documents or reports were considered but not relied upon in the preparation of said Section 2.6.

INTERROGATORY NO. 3: Identify by name, title and affiliation, each person contacted regarding the above matter.

ANSWER:

As indicated in the answer to Interrogatory No. 1, Applicants did not prepare Section 2.6 of the Final Environmental Statement. Accordingly, Applicants cannot identify persons contacted regarding the preparation of said Section 2.6.

INTERROGATORY NO. 4: Identify by name, title and affiliation each staff, employee or consultant that has the expert knowledge required to support the answers to the above questions.

ANSWER:

Not applicable.

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INTERROGATORY NO. 5: Identify the expert(s), if any, whom the Applicant intends to have testify on the subject matter questioned. State the qualifications of each such expert.

ANSWER:

The Applicant has not at this time selected an expert who would be expected to testify on the subject matter questioned.

INTERROGATORY NO. 6: Is Section 2.6.3 of the Final Environmental Statement representative of all sections of this Statement in: (A) its accuracy, (B) completeness of data, (C) depth of research and (D) degree of contact or concern for local information?

ANSWER:

As indicated in the answer to Interrogatory No. 1, the Final Environmental Statement, including Section 2.6.3 thereof, was prepared by the NRC Staff. Accordingly, Applicants are not in a position to comment on whether this section is "representative of all sections in this Statement."

INTERROGATORY NO. 7: What wind loading in pounds per square foot was used in design of buildings and structures? Identify by name, title, affiliation and qualification person(s) responsible for design.

ANSWER:

For Category I structures, wind loads were developed for both tornadoes and hurricanes. The tornado wind loading for Category I structures is 332 pounds per square foot. The hurricane wind loading is 52 pounds per square foot at 30 feet above ground. For the Non-Category I structures, a hurricane wind loading of 48 pounds per square foot at 30 feet above ground is used.

Mr. D. G. Barker, Manager, South Texas Project is responsible for the overall design of the South Texas Project. The actual design documents are prepared, reviewed and approved by a large number of engineers who report to Mr. Barker. Mr. Barker's qualifications are set forth in Attachment 1.

INTERROGATORY NO. 8: Describe your basis for said wind loading, including a detailed description of the methodology utilized to reach such conclusion of wind loading.

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ANSWER:

Wind loading on buildings and structures are calculated in accordance with American National Standards Institute (ANSI) A58.1-1972. The methodology utilized for hurricane winds is to select a basic annual extreme fastest-mile wind speed at 30 feet above ground for a specified mean recurrence interval and to determine the exposure condition based on the surrounding terrain. Effective velocity pressures are then calculated according to equations given in ANSI A58.1-1972. These equations include a value for the gust factor and also a term which takes into consideration the increase in wind speed with height above ground. Effective velocity pressures are tabulated in ANSI A58.1-1972 for external pressures on the overall structure or on parts and portions of the structure and also for internal pressure. The effective velocity pressures are then modified using coefficients which are dependent on the shape and orientation of the structure and also vary with elevation on the particular building or structure. Coefficients for normal buildings and structures are presented in ANSI A58.1-1972. After applying the pressure coefficients, the final step is to algebraically combine the appropriate external and internal pressures to arrive at the design wind loading on the structure. The methodology utilized for tornado winds is similar to that described above. The salient differences concern the wind speed selected and its variance with height. The tornado wind speed is obtained from NRC Regulatory Guide 1.76, Revision 0. The value for the STP site is a constant velocity wind speed of 360 mph. Section 3.3.2 of the NRC Standard Review Plan states that the velocity pressure is to be assumed constant with height.

INTERROGATORY NO. 9: Have vibration and stress analyses on steam lines between containment and turbine generator buildings included effects of hurricane wind loadings? Explain.

ANSWER:

Portions of the main steam lines between the Reactor Containment Building (RCB) and the Turbine Generator Building (TGB) are located within the Isolation Valves Cubicle (IVC). The IVC is designed to withstand all postulated natural phenomena, including hurricane wind loadings. The stress analysis for the section of the main steam lines between the IVC and the TGB (approximately 10 ft.) will include the effect of hurricane wind loadings as required by Section III of the ASME

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Code. Neither the ANSI standard for non-safety piping nor the ASME code for safety piping utilize hurricane wind loadings for vibration analyses. Thus, the STP vibration analyses do not consider it.

INTERROGATORY NO. 10: What peak wind gusts were used for design? Explain why.

ANSWER:

Based on ANSI A58.1-1972, structures are designed using an appropriate basic annual extreme fastest-mile wind speed which is selected and then substituted into equations given in ANSI A58.1-1972 to convert this wind speed into effective velocity pressures. These equations include a gust factor which is calculated from a specified equation. A value of 1.30 is used for the gust factor. Answers to Interrogatory No. 7 provide the loads which include this gust factor.

INTERROGATORY NO. 11: Reference S.T.P. Units 1 & 2 Drawings No. 1-M-0014-2 and 1-M-0016-2;

(A) Has stress analysis of mitre joints in low pressure turbine exhaust considered the variable forces of hurricane wind loading?

(B) If so, what peak wind gusts were used for design? If not, why? Identify documents, and particular parts thereof, relied upon for this determination.

(C) Are traveling cranes braked and anchored for hurricane winds? If so, explain how. If not, why not?

ANSWER:

(A)&(B) No. The Low Pressure (LP) Turbines exhaust into integral hoods which direct steam into the condenser dome. There is no piping associated with the LP Turbine exhausts and hence no piping joints, mitred or otherwise.

(C) Yes. The parking locks and rail clamps of the Turbine Generator Building cranes (traveling cranes identified in Drawings No. 1-M-0014-2 and 1-M-0016-2) are designed to hold the crane in position under wind loadings which exceed hurricane wind loadings.

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INTERROGATORY NO. 12: What peak hurricane winds were considered for design of outside piping generally?

(A) Identify all documents relied upon in design of outside piping.

(B) Identify all documents examined but not relied upon in design of outside piping.

(C) Where this piping contains expansion joints which are placed in lateral deflection by high wind loading, have allowable axial loads and deflections been reduced?

(D) If so, provide methodology utilized, if not, why not?

(E) Has allowable cycles, or joint life been reduced? If so, provide methodology utilized. If not, why not?

ANSWER:

The design of outside, above ground "Category I" piping will consider the 125 MPH hurricane wind. The design of outside, above ground "non-Category I" piping will consider the 120 MPH hurricane wind.

(A) ASME Code, Section III, Subsection 3600; ANSI B31.1.

(B) A list of such documents does not exist.

(C) No expansion joints exist in the outdoor, above ground piping.

(D) Not Applicable.

(E) Not Applicable.

INTERROGATORY NO. 13: What influence will peak hurricane winds from the east have on static and dynamic resistance to flow of water from the turbine waterbox condensers through the cooling water discharge structure? Explain.

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ANSWER:

Probable Maximum Hurricane (PMH) winds from the east would have the overall effect of lowering the static resistance to flow due to the setup induced in the western portion of the reservoir lowering the water level at the discharge structure. Concurrently there would be a setup induced at the eastern portion of the reservoir which would tend to increase the water level at the Intake Structure. The maximum setup which can be generated anywhere in the reservoir by the PMH is 1.49 ft. (see Section 2.4.8.2.3 of the South Texas Project Final Safety Analysis Report). Assuming a 1.49 foot drop in water level at the Discharge Structure and a 1.49 foot rise at the Intake Structure results in a total static decrease to flow resistance of 2.98 feet. Utilizing the Circulating Water Pump performance curve it is possible to predict a flow increase of approximately 5,000 gpm per pump or 20,000 gpm for the total system. This represents a flow increase of approximately 2.2%. Dynamic flow resistance due to friction losses and momentum change losses would increase slightly due to the slightly higher flow rate within the Circulating Water System.

INTERROGATORY NO. 14: Considering the essential requirement of concrete bonding with reinforcing bar, what evaluation has been made of the voids around rebar where the existence of surface voids is/is not apparent?

- (A) Provide documentation of evaluation, complete with methodology utilized and results.
- (B) If not yet done, provide explanation why.
- (C) Under what section of the ASME Code will the containment buildings be pressure tested?
- (D) What will be the test pressure?

ANSWER:

(A) Documentation of the evaluation of voids around rebar, with the methodology utilized, is given in a report to the NRC entitled, "SECOND INTERIM REPORT ON THE REPORTABLE DEFICIENCY CONCERNING CONCRETE VOIDS IN THE EIGHTH LIFT OF THE UNIT ONE REACTOR CONTAINMENT BUILDING," dated August 15, 1979 and previously sent to intervenors.

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(B) As noted in the above referenced letter, final results of the investigation will not be completed until February 1980.

(C) Section (ARTICLE) CC 6000, "Structural Integrity Test of Concrete Containment Structures," of Section III, Division 2, of the Proposed ASME Boiler & Pressure Vessel Code, 1973 Edition.

(D) 65 psi.

INTERROGATORY NO. 15: With respect to Question 14, 14A and 14B, please provide the same information for the following:

- (A) Fuel handling building
- (B) Turbine generator building
- (C) Mechanical and electrical auxiliaries building
- (D) Diesel generator building
- (E) Demineralizer building
- (F) Cooling water intake structure

ANSWER:

The Applicant objects to this interrogatory on the grounds that it is not relevant to an admitted contention and, therefore, cannot be reasonably calculated to lead to the discovery of admissible evidence. See, Rule 26(b)(1) of the Federal Rules of Civil Procedure. Moreover, Section 2.740(b)(1) of the Commission's Rules of Practice provides that discovery "shall relate only to those matters in controversy which have been identified by the Commission or the presiding officer in the prehearing order entered at the conclusion of [the] prehearing conference."

INTERROGATORY NO. 16: Have all voids existing in the containment buildings been located or identified?

INTERROGATORY NO. 17: If not, why not?

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ANSWER (Interrogatory 16 and 17):

The locating and identifying of all voids in the Containment Buildings is in progress.

INTERROGATORY NO. 18: If so, describe your basis for this conclusion, including a detailed description of the methodology utilized to reach such conclusion.

ANSWER:

Not applicable.

INTERROGATORY NO. 19: Identify by name, title and location those employees of applicant or Brown & Root that have personal knowledge required to support the answers to Questions 16 & 17.

ANSWER:

Mr. A. J. Granger, Project Engineering Manager, and Mr. T. D. Stanley, Project Quality Assurance Supervisor, Houston Lighting & Power Company, 611 Walker Street, Houston, Texas.

INTERROGATORY NO. 20: Have those voids that have been discovered been repaired?

INTERROGATORY NO. 21: If not, why not?

ANSWER (Interrogatories 20 and 21):

Voids that have been discovered in certain areas of the Unit 1 containment shell have been repaired. Voids discovered elsewhere are scheduled for repair.

INTERROGATORY NO. 22: If so, provide a detailed description of the methodology utilized, including but not limited to determination of area, material used, testing of material, and quality control inspection.

ANSWER:

A detailed description of the methodology utilized to repair containment voids, including determination of area, material used, and testing of material, can be found in the HL&P reports to the NRC which are entitled "FINAL REPORT ON THE REPORTABLE DEFICIENCY CONCERNING CONCRETE VOIDS IN THE UNIT 1

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REACTOR CONTAINMENT BUILDING," dated June 5, 1979 (Attachment 2 hereto), and "SECOND INTERIM REPORT ON THE REPORTABLE DEFICIENCY CONCERNING CONCRETE VOIDS IN THE EIGHTH LIFT OF THE UNIT 1 REACTOR CONTAINMENT BUILDING," dated August 15, 1979 (previously forwarded to Intervenors).

The repair procedure specifies that Quality Assurance perform inspection and surveillance whenever the repair is in progress, and that this inspection be documented. The Quality Assurance inspection includes, but is not limited to: verifying that the design engineer or his representative was present each day for the repair operation, surveilling the activities related to the mixing of the grout, verifying that the placement of grout is continuous for each port injection, and ensuring that the daily inspection report is complete and submitted each day to the design engineer or his representative.

INTERROGATORY NO. 23: Identify by name and title employees of applicant and Brown and Root that have the direct knowledge required to support the answer to Question 22.

ANSWER:

Mr. A. J. Granger, Project Engineering Manager, Houston Lighting & Power Company; Mr. T. D. Stanley, Project Quality Assurance Supervisor, Houston Lighting & Power Company; Mr. J. L. Hawks, Engineering Project Manager, Brown & Root, Inc.; Mr. C. W. Vincent, Quality Assurance Project Manager, Brown & Root, Inc.

INTERROGATORY NO. 24: Provide access to and/or documentation relating to placement inspection and corrective measures involving taper ties used in walls of the containment buildings as well as the structures named in Question 15, including but not limited to deficiency and disposition reports.

INTERROGATORY NO. 25: Provide testing criteria required for the grout placed in tie-holes

(A) Below grade

(B) Above grade

INTERROGATORY NO. 26: Provide access to and/or documentation of grouting of tie-holes in the containment and fuel handling buildings including methodology utilized.

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ANSWER (Interrogatories 24, 25 and 26):

Taper ties are not used in the exterior containment shell walls, and there are no tie holes in the exterior containment shell walls. The only contentions colorably related to these inquiries are concerned with the exterior walls of the containment buildings; therefore, Applicant objects to providing documentation related to taper ties for the other structures named in Question 15. See Answer to Interrogatory No. 15.

INTERROGATORY NO. 27: Identify by name and title employees of Applicant and Brown & Root that have direct knowledge required to support the answers to Questions 24, 25 & 26.

ANSWER:

Mr. A. J. Granger, Project Engineering Manager, Houston Lighting & Power Company; Mr. J. L. Hawks, Engineering Project Manager, Brown & Root, Inc.

INTERROGATORY NO. 28: Provide access to and/or documentation of placement and inspection of waterproof membrane on containment and fuel handling buildings.

ANSWER:

Documentation relating to placement and inspection of waterproof membrane on the Reactor Containment Buildings will be made available for inspection and copying at the South Texas Project site office off of Farm-to-Market Highway 521 in Matagorda County, Texas. Contention 1, Item 4, as accepted by the Licensing Board in its August 3, 1979 Order, relates specifically to waterproof membrane seals in the containment structure. Therefore, the Applicant objects to the remainder of this interrogatory on the basis that it is not relevant to an admitted contention. See Answer to Interrogatory No. 15.

INTERROGATORY NO. 29: Describe in detail the methodology utilized, including dates and times completed, of placement and inspection of waterproof membrane on all other structures below grade.

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ANSWER:

Contention 1, Item 4, as accepted by the Licensing Board in its August 3, 1979 Order, relates specifically to waterproof membrane seals in the containment structure. Therefore, Applicants object to this interrogatory on the basis that it is not relevant to an admitted contention. See answer to Interrogatory No. 15.

INTERROGATORY NO. 30: Provide access to and/or documentation of back-fill activities that would impact waterproof membrane, including but not limited to place, time of day/night and time required for completion.

ANSWER:

Documentation of activities that may impact the waterproof membrane on the Reactor Containment Buildings will be made available for inspection and copying at the South Texas Project site office off of Farm-to-Market Highway 521 in Matagorda County, Texas.

INTERROGATORY NO. 31: Identify by name and title employees of Applicant and Brown & Root that have the direct knowledge to support the answer to Questions 28, 29 & 30.

ANSWER:

Mr. T. D. Stanley, Project Quality Assurance Supervisor, Houston Lighting & Power Company; Mr. C. W. Vincent, Quality Assurance Project Manager, Brown & Root, Inc.

INTERROGATORY NO. 32: Provide access to and/or documentation demonstrating that adequate and up-to-date as-built drawings and specifications are available to determine the actual condition of construction features resulting from design changes in critical areas of safety related buildings and structures.

ANSWER:

The final "as built" configuration is described by a design package which incorporates the original document and all change notices executed according to the procedures delineated below:

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1. Procedure STP-PMO-021, "Field Requests for Engineering Action."
2. Procedure STP-DC-023, "Field Requests for Engineering Action."
3. Procedure A040GCP-21, "Field Requests for Engineering Action."
4. Procedure STP-QAP-2.6, "Nonconformances."
5. Procedure STP-DC-022, "Nonconformance Reports."

Items 1, 2 and 5 will be made available at the Clinton Drive offices of Brown & Root, Inc. (Engineering Southwest Building), 4100 Clinton Drive, Houston, Texas. Items 3 and 4 will be made available at the South Texas Project site office off of Farm-to-Market Highway 521 in Matagorda County, Texas.

INTERROGATORY NO. 33: Identify by name and title employees of Applicant and Brown & Root who performed the work related to the above question, including but not limited to qualifications and expertise of said employees.

ANSWER:

Throughout the course of the Project, thousands of engineers, designers, draftsmen, and inspectors performed the work related to Interrogatory No. 32. Therefore, it is overburdensome, if not impossible, to identify each and every employee as requested. Accordingly, Applicants object to answering this interrogatory.

INTERROGATORY NO. 34: Identify by name, title and present location those employees of Applicant and Brown & Root who worked on as-builts during April, May and June 1979.

ANSWER:

Several hundred employees were involved in the generation, review, approval, distribution, and control of design documents during this period of time. An equally large number of employees were involved in the generation, distribution, review, approval, implementation, and control of Field Requests for Engineering Actions and Nonconformance Reports. Therefore, for the reasons stated in the answer to Interrogatory No. 33, Applicants cannot reasonably respond and, therefore, object to this interrogatory.

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INTERROGATORY NO. 35: Provide access to and/or documents utilized in performing work referred to in Question 34 above.

ANSWER:

To the extent they can be identified, design packages worked on during April, May and June 1979 will be made available for inspection and copying at the South Texas Project site office off of Farm-to-Market Highway 521 in Matagorda County, Texas.

INTERROGATORY NO. 36: Provide access to and/or documentation demonstrating that placement and inspection of steel reinforcing bars adhered to specifications in the original design.

ANSWER:

Documentation relating to the placement and inspection of reinforcing steel will be made available for inspection and copying at the South Texas Project site office off of Farm-to-Market Highway 521 in Matagorda County, Texas.

INTERROGATORY NO. 37: If placement and inspection of rebars did not correspond with specifications in original design, explain justification for changes, including rationale pertaining thereto.

ANSWER:

Changes due to interference or congestion of rebar, or to facilitate concrete placement, are documented on Field Requests for Engineering Action (FREA). Other changes in the containment reinforcing steel, if any, are identified on Nonconformance Reports (NCR). The rationale for the design changes are documented on the individual FREAs and NCRs. Copies of the pertinent FREAs and NCRs will be made available for inspection and copying at the South Texas Project site office off of Farm-to-Market Highway 521 in Matagorda County, Texas.

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INTERROGATORY NO. 38: Identify by name, title and present location those persons who authorized above changes including, but not limited to, qualification and expert knowledge utilized.

ANSWER:

The names and title of those persons who authorize design changes described in response to Interrogatory No. 37, are identified on the individual Field Requests for Engineering Action (FREA) and Nonconformance Reports (NCR), which Applicants have agreed to make available for inspection and copying in the Answer to Interrogatory No. 37. The qualifications and present location, if known, of the person(s) authorizing design changes will be made available upon request in connection with the review of the pertinent FREAs and NCRs.

INTERROGATORY NO. 39: Provide access to and/or documentation of inspection of cadwelds prior to concrete pours in containment buildings, including but not limited to, verification procedures and methodology utilized.

ANSWER:

Documentation relating to inspection of cadwelds prior to concrete pours in containment buildings will be made available for inspection and copying at the South Texas Project site office off of Farm-to-Market Highway 521 in Matagorda County, Texas.

INTERROGATORY NO. 40:

Please explain methodology utilized for verification of cadweld integrity and exact placement in safety related structures.

ANSWER:

The verification of cadweld integrity is accomplished through the use of a destructive testing program in which splices are removed and delivered to a field laboratory for tensile testing. The testing program utilizes production splices (a splice made in place for actual construction) and sister

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splices (a test splice prepared adjacent to a production splice and which is made immediately after the production splice by the same splicer). Tensile testing for each splicer is conducted for horizontal, vertical, and diagonal positions by randomly selecting: first, one of the first ten splices; second, one of the next ninety splices; and third two of the next and each subsequent units of one-hundred splices.

If any production splice test fails the strength requirements, the adjacent production splices on each side of the failed splice are tested. If any sister splice used for testing fails to meet the strength requirements, two additional sister splices are tested. If any of the additional tests (production or sister splices) also fails, splicing is halted. Splicing is also halted if the running average of fifteen consecutive samples is less than the specified ultimate yield strength. In either case, splicing is not resumed until the cause of failure has been corrected. When splicing resumes, the testing frequency is started anew.

The location documentation is completed as soon as possible (daily if practical) after the cadwelds are made. Location is provided on location schedules or by marking location and cadweld number on placing plans. In either instance reference points are provided from which measurements are made.

INTERROGATORY NO. 41: Identify by name and location employees of Brown & Root or applicant with direct knowledge to support the answers to questions 38 and 39.

ANSWER:

Mr. A. J. Granger, Project Engineering Manager, Mr. T. D. Stanley, Project Quality Assurance Supervisor, Houston Lighting & Power Company, 611 Walker Street, Houston, Texas.

INTERROGATORY NO 42: Provide access to and/or documentation pertaining to concrete pours in the cooling water intake structure located in the 7,000 acre cooling water lake including, but not limited to, pour packages for the months of January, February and March 1979.

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ANSWER:

Documentation relating to concrete pours in the Cooling Water Intake Structure will be made available for inspection and copying at the South Texas Project site office off of Farm-to-Market Highway 521 in Matagorda County, Texas.

INTERROGATORY NO. 43: Please explain criteria and methodology utilized for testing of concrete, including, but not limited to, aggregate sieve and moisture analysis, slump and quality control.

ANSWER:

The criteria and methodology utilized for testing of concrete for the South Texas Project are as follows:

A. Materials -

For cement: American Society of Testing and Materials (ASTM) C150-74, "Specification for Portland Cement," Type II, low alkali, moderate heat, and Section CC-2221 of the American Society of Mechanical Engineers-American Concrete Institute (ASME-ACI) 359.

For aggregates: ASTM C33-74 and the following additional requirements:

- a. Coarse aggregate gradations conform to ASTM size No. 4 or ASTM size No. 67;
- b. Limits on deleterious substances and physical properties of coarse aggregate comply with Table 3, "Moderate Weathering Region," tentative revision to ASTM C33-74;
- c. Flat and elongated particles are limited to a maximum of 15 percent as defined and determined by U. S. Army Corps of Engineers Standards (CRD) C119;
- d. Abrasion loss, tested in accordance with ASTM C131-69, does not exceed 40 percent;

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- e. Fine aggregate gradation complies with ASTM C33-74;
- f. Paragraph CC-2222, Subparagraph CC-2222.1, Sub-Subparagraphs a, d, e, and f and Subparagraph CCC-2222.2, Sub-Subparagraphs a and b of ASME-ACI 359;
- g. Deleterious substances in the fine aggregate do not exceed the following:
 - 1) 3.0 percent for clay lumps and friable particles
 - 2) 3.0 percent for material finer than No. 200 mesh
 - 3) 0.5 percent for coal and lignite
- h. Fineness modulus of the fine aggregate is between 2.5 and 3.1.

The potential reactivity of the aggregates is evaluated in accordance with the Appendix to ASTM C33-74. Aggregates for use in concrete are sampled and tested in accordance with Table CC 5200-1 of ASME-ACI 359.

For water used in mixing concrete and producing ice onsite:

- a. Paragraph CC-2223, Subparagraphs CC-2223.1 and CC-2223.2, of ASME-ACI 359;
- b. Table CC 5200-1 of the ASME-ACI 359.

For admixtures: ASTM C260-73, "Standard Specification for Air-Entraining Admixtures for Concrete" and ASTM C494-71, "Standard Specifications for Chemical Admixtures for Concrete (Type A and Type D)."

In addition to the requirements of ASTM C260-73 and ASTM C494-71, the following requirements regarding the chloride ion content of the admixtures are applicable:

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- a. The chloride ion content of the admixture does not exceed 1 percent by weight of the admixture; and
- b. The chloride content of the admixture is such that when the admixture is added to the concrete, the chloride content of the concrete is not increased by more than 5 ppm.

B. Concrete Mixes

Mix proportions are based on the requirements of Sub-paragraph CC2232.2 of ASME-ACI 359.

C. Concrete Properties

The concrete for the Containment shell has a minimum compressive strength of 5,500 psi at 90 days (Class A). The specified plastic properties are applicable at point of placement. The slump range is 2 to 4 in. and the air content range is 3 to 5 percent. Slump is determined in accordance with ASTM C143-71 and the air content is determined in accordance with ASTM C231-73. Plastic unit weights are monitored in order that the required shielding characteristics of the concrete is in excess of 136 lb/ft³. Confirmatory tests to determine modulus of elasticity, Poisson's ratio, coefficient of thermal conductivity, coefficient of linear thermal expansion, length change (shrinkage coefficient), and density are performed on the mix proportions to provide actual property values for comparison with assumed design values. In addition, uniaxial creep, air dry unit weight, and apparent chloride content of the concrete were determined as modified by the concrete testing specification for a similar comparison.

D. Quality Assurance Programs

Quality Assurance programs were established and implemented in accordance with Article CA-4000 of ASME-ACI 359.

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INTERROGATORY NO. 44: When concrete was pumped from grade level to various heights, at what point was the concrete tested?

ANSWER:

When concrete was pumped from grade level to various heights the concrete was tested at grade level.

INTERROGATORY NO. 45: Explain methodology and testing criteria utilized.

ANSWER:

See Answer to Interrogatory No. 43.

INTERROGATORY NO. 46: Provide document and/or order requiring that concrete be sampled and tested at level which concrete is pumped to, said order was issued on or about September 17, 1979.

ANSWER:

To the best of our knowledge there exists no order or document issued on or about September 17, 1979 generally requiring that concrete be sampled and tested at the level to which concrete is pumped. However, Field Request for Engineering Action No. 2-C-3862, approved September 13, 1979, includes the following requirement:

"Concrete mix A-1-3-20 will be pumped from three pumps located near the Equipment Hatch. The Whiteman pump will place the area of the Equipment Hatch at a rate not to exceed 40 cy/hr. The two Reinert pumps will place the remainder of the wall at a combined rate not to exceed 125 cy/hr. The slump for this mix at the truck discharge point will be 5" to 7", 7" maximum. Concrete slump at the truck discharge between 4" and 5" may be accepted for placement by the cognizant area engineer. In addition, concrete will be monitored at the pump discharge (on the wall). Informational slump tests will be taken as determined by the cognizant area engineer at the pump discharge if the slump appears questionable. The minimum slump for these samples shall be 3". If the slump is less than 3", concrete in

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that pumpline shall be wasted thru a discharge line until 3" slump is achieved."

INTERROGATORY NO. 47: Provide access to and/or documentation of night shift inspections prior to 1978.

ANSWER:

Reports on inspections are not filed by shift or time of day at which the inspection was conducted. Most inspection documents do not provide the time of the inspection. Therefore, it is impossible to directly retrieve the information requested. However, in a limited number of instances the documentation does reflect that the inspection was conducted during the night shift. To the extent this documentation correlates inspections and night shifts prior to 1978, it will be made available for inspection and copying at the South Texas Project site office off of Farm-to-Market Highway 521 in Matagorda County, Texas.

INTERROGATORY NO. 48: Identify by name and present location quality control inspectors employed by Brown and Root at STP during 1976, 1977 and 1978, giving information relating to qualifications, training, area of responsibility and length of employment.

ANSWER:

See list of quality control inspectors employed by Brown & Root, Inc., and attached as Attachment 3 hereto. Information relating to qualifications, training and area of responsibility will be made available for inspection and copying at the South Texas Project site office off of Farm-to-Market Highway 521 in Matagorda County, Texas. The location of former employees is unknown to Applicants.

INTERROGATORY NO 49: Provide access to and/or documentation of Brown and Root internal investigations of alleged beatings of Larry Perry and James Marshall.

ANSWER:

Larry Perry and James Marshall were or are employees of Brown & Root, Inc. and were not employees of any of the Applicants.

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Therefore, Applicants were not involved in the Brown and Root internal investigations with respect to alleged beatings of Larry Perry or James Marshall. Applicants have made inquiries of Brown & Root, Inc., and are informed no such documentation exists. Further inquiries are being made by Brown & Root, Inc., as to possible existence of documents other than those described, which may have a bearing on the inquiry.

INTERROGATORY NO. 50: Provide documents, statement or papers offered to Larry Perry or James Marshall for their signatures.

ANSWER:

Applicants assume this interrogatory refers to "documents, statements or papers offered to Larry Perry or James Marshall for their signatures" in connection with internal investigations of Brown & Root, Inc. of the alleged beatings of Larry Perry and James Marshall. See Answer to Interrogatory 49 in this regard.

INTERROGATORY NO. 51: Provide document, statement or paper offered to Dan Swayze for his signature prior to his dismissal by Brown & Root.

ANSWER:

Dan Swayze was an employee of Brown & Root, Inc., and was not an employee of any of the Applicants. Therefore, Applicants did not offer any document, statement or paper to Dan Swayze for his signature prior to his dismissal. Applicants have made inquiries of Brown & Root, Inc., and are informed by Brown & Root, Inc. that such document, statement or paper, is deemed privileged from disclosure as being personal to Mr. Dan Swayze. Brown & Root, Inc. has further advised: that Mr. Dan Swayze has heretofore filed suit against Brown & Root alleging slander; that one of the defenses asserted by Brown & Root to such suit was that the allegedly slanderous material had not been published; and that the suit brought by Mr. Swayze has been dismissed. Brown & Root, Inc. further advises that any such document, statement or paper offered to Mr. Dan Swayze for his signature prior to his dismissal by Brown & Root can be made available upon execution and delivery of a consent and release by Mr. Dan Swayze and issuance of a protective order fully protecting Brown & Root from liability for defamation.

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INTERROGATORY NO. 52: Provide access to and/or documentation of corrective action following severe flooding in July and September 1979 including, but not limited to, water depth, listing of damages and methodology utilized to mitigate damages.

ANSWER:

During the week of July 22, 1979, the South Texas Project experienced very heavy rains as a result of tropical storm "Claudette". This rain caused flooding in some construction areas where construction is not complete (e.g., the dome for containment was not installed). On Monday July 30, 1979, a concentrated inspection program was initiated by the Brown & Root Permanent Plant Maintenance Department to determine if the flooding had caused damage to any of the equipment. All areas were inspected and no equipment was found to be damaged. The storms of September 1979 were not as severe as the July 1979 storms. Inspections were performed as a result of these storms through the normal ongoing maintenance program.

INTERROGATORY NO. 53: Identify by name and title employees of applicant or Brown & Root who have direct knowledge to support answer to question 52.

ANSWER:

Mr. L. K. English, Project Site Manager, Houston Lighting & Power Company.

INTERROGATORY NO. 54: Provide copies of all Applicant and Brown and Root documents involved and retained or copied by F.B.I. Agents during the investigation of falsification of construction documents which was initiated in June, 1979.

ANSWER:

F.B.I. Agents did not retain or copy any of Applicants' or of Brown & Root's documents made available to said agents by Applicants during the investigation of falsification of construction documents which was initiated in June, 1979. Applicants have made inquiries of William A. Brown, Esq., attorney for Brown & Root, Inc., and are informed that said agents did not retain or copy any documents of Applicants or of Brown & Root, Inc. made available by Brown & Root, Inc. during said investigation, to the best of his knowledge and belief.

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INTERROGATORY NO. 55: Identify by name and title employees, staff or attorneys of Applicant and Brown and Root who can verify accuracy of the answer to Question 54.

ANSWER:

Mr. E. A. Turner, Vice President, Houston Lighting & Power Company; Mr. R. A. Frazar, Manager, Quality Assurance, Houston Lighting & Power Company; and William A. Brown, Esq., Powell, Brown & Maverick, Attorney for Brown & Root, Inc.

INTERROGATORY NO. 56: Provide access to and/or documents, and the particular parts thereof, relied upon by the Applicant which served as the basis for Sections 3.5 and 5.4 and related tables in the F.E.S.

ANSWER:

For the reason stated in response to Interrogatory No. 1, Applicants cannot provide a direct response to this interrogatory. To the extent that FES Section 3.5 and 5.4 references are in Applicants' possession, they will be made available for inspection and copying at Houston Lighting & Power Company's Energy Development Complex, 12301 Kurland, Houston, Texas.

INTERROGATORY NO. 57: Provide access to and/or documents, and the particular parts thereof, examined but not relied upon which pertain to the subject matter referred to in the previous question.

ANSWER:

As indicated in the Answer to Interrogatory No. 1, Applicants did not prepare FES Sections 3.5 and 5.4 and related tables. Accordingly, Applicants are not in a position to advise as to whether documents or reports were considered but not relied upon in the preparation of said Sections 3.5 and 5.4 and said related tables.

INTERROGATORY NO. 58: Identify by name, title, and affiliation each employee or consultant that has the expert knowledge required to support the answers to questions 56 and 57.

ANSWER:

Not applicable.

INTERROGATORY NO. 59: Provide access (sic) to and/or documents, and the particular parts thereof, relied upon by the Applicant which served as the basis for Sections 4.1 and 5.3 and related tables in the F.E.S.

ANSWER:

For the reason stated in response to Interrogatory No. 1, Applicants cannot provide a direct response to this interrogatory. To the extent that FES Section 4.1 and 5.3 references are in Applicants' possession, same will be made available for inspection and copying at Houston Lighting & Power Company's Energy Development Complex, 12301 Kurland, Houston, Texas.

INTERROGATORY NO. 60: Provide access (sic) to and/or documents, and the particular parts thereof, examined but not relied upon which pertain to the subject matter referred to in the previous question.

ANSWER:

As indicated in the Answer to Interrogatory No. 1, Applicants did not prepare FES Sections 4.1 and 5.3 and related tables. Accordingly, Applicants are not in a position to advise as to whether documents or reports were considered but not relied upon in the preparation of said Sections 4.1 and 5.3 and said related tables.

INTERROGATORY NO. 61: Provide access to and/or documentation of any and all soil tests, cores, subsidence studies, settlement calculations and related documents concerning soil makeup performed prior to or during construction activities.

ANSWER:

Documentation related to soil tests, cores, and soil makeup will be made available for inspection and copying at the South Texas Project Site. Subsidence studies, settlement calculations and related documents concerning soil makeup are available for inspection and copying at the Brown & Root Clinton Drive Facility (Engineering Southwest Building) 4100 Clinton Drive, Houston, Texas.

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INTERROGATORY NO. 62: Identify by name, title and affiliation each employee or consultant that has the expert knowledge required to support the answer to question 61.

ANSWER:

Mr. A. J. Granger, Project Engineering Manager, Houston Lighting & Power Company.

INTERROGATORY NO. 63: Provide access to and/or documentation of soil moving activities related to preparation of cooling lake and surrounding dam including, but not limited to, depth of excavation, soil makeup, testing and inspections.

ANSWER:

The requested documentation will be made available for inspection and copying at the South Texas Project site office off of Farm-to-Market Highway 521 in Matagorda County, Texas.

INTERROGATORY NO. 64: Identify by name, title and present location persons with personal knowledge and expertise necessary to verify the answer to question 63.

ANSWER:

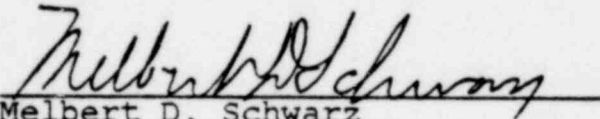
Mr. A. J. Granger, Project Engineering Manager, Houston Lighting & Power Company.

In those instances in which a request for access to documents, reports and/or other data has been made, Applicants indicate by their answer that such material will be made available at the current location of such material. Due to the great volume of material requested, Applicants request the Intervenor to notify either Melbert D. Schwarz or C. Thomas Biddle, Jr., attorneys for Houston Lighting & Power Company, by telephone at (713) 229-1234 at least two

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full business days prior to the time the Intervenor desires to inspect the material. At the time of notification, Applicants also request the Intervenor to indicate: (i) the order, by Interrogatory Number, in which it desires to inspect this material; and (ii) the identity of all persons requesting access to this material on a given date.

Respectfully submitted,


Melbert D. Schwarz
C. Thomas Biddle, Jr.
Charles G. Thrash, Jr.
3000 One Shell Plaza
Houston, Texas 77002

Jack R. Newman
Robert H. Culp
1025 Connecticut Avenue, N.W.
Washington, D.C. 20036

- Attorneys for HOUSTON LIGHTING & POWER COMPANY, Project Manager of the South Texas Project, acting herein on behalf of itself and the other Applicants, THE CITY OF SAN ANTONIO, TEXAS, acting by and through the City Public Service Board the City of San Antonio, CENTRAL POWER AND LIGHT COMPANY and THE CITY OF AUSTIN, TEXAS

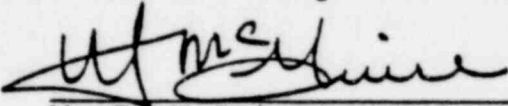
OF COUNSEL:
Baker & Botts
3000 One Shell Plaza
Houston, Texas 77002

Lowenstein, Newman, Reis,
Axelrad & Toll
1025 Connecticut Avenue
N.W. Washington, D.C. 20036

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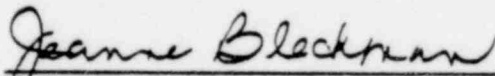
STATE OF TEXAS §
 §
COUNTY OF HARRIS §

BEFORE ME, the undersigned authority, on this day personally appeared W. F. McGuire, who upon his oath stated that he has answered the foregoing Interrogatories Nos. 1, 2, 3, 4, 5, 6, 56, 57, 58, 59 and 60 in Applicants' Answers to First Set of Interrogatories and Motion for Inspection and Production of Documents by Citizens for Equitable Utilities, Inc., et al., in his capacity as Principal Engineer, Environmental Planning and Assessment for Houston Lighting & Power Company, Project Manager of the South Texas Project, on behalf of itself and the other Applicants, and that all statements contained therein are true and correct to the best of his knowledge and belief.



W. F. McGuire

SUBSCRIBED AND SWORN TO BEFORE ME by the said W. F. McGuire, on this 21st day of December, 1979.



Notary Public in and for
Harris County, Texas

My commission expires:

June 1, 1980

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Mr. D. G. Barker, Manager, South Texas Project, graduated from Texas A&M University in 1967, with a BS degree in Mechanical Engineering and in 1968 with a Master of Engineering degree in Nuclear Engineering. While working on his BS degree, Mr. Barker was employed by Union Carbide Corporation from 1965 to 1966 as a Mechanical Engineer in the Engineering Machinery Group. His responsibilities were in the areas of maintenance design, vibration analysis, and economic analysis on process equipment. From 1966 to 1968, Mr. Barker was employed as a Research Assistant and later as a Coordinating Engineer at the Nuclear Science Center under the Texas Engineering Experiment Station of the Texas A&M University System. There he performed work in the analysis, design, fabrication and testing of equipment used in the Triga Reactor conversion. In 1968, Mr. Barker joined the Nuclear Division of Todd Shipyards Corporation as a Nuclear Engineer. In this position, Mr. Barker performed analysis and calculations in reactor physics, shielding, thermal hydraulics, mechanical design and vibrations in support of the NS Savannah program. Mr. Barker was later assigned as Project Engineer for the NS Savannah Core II where he was responsible for supervising and coordinating the efforts of engineers, technicians, subcontractors and vendors involved in evaluation of the nuclear and mechanical adequacy of the NS Savannah Core II. From 1971 to 1972, Mr. Barker worked at the H. B. Zachry Company as a Quality Assurance Supervisor assisting in the establishment of the company's QA program. In this capacity, Mr. Barker wrote sections of the H. B. Zachry Company Quality Assurance Manual, performed vendor audits and construction planning.

In 1972, Mr. Barker joined HL&P as a Nuclear Engineer and in March, 1973 was appointed Manager of the Quality Assurance Department. He was named Power Plant Construction Manager in 1977 with the responsibility of administration, scheduling and coordination of the construction phase of all power plants. In 1978, he was named Manager, South Texas Project, and as such assumed total responsibility for all aspects of STP. Mr. Barker is a registered Professional Engineer in Texas and is a member of the American Nuclear Society and the American Society of Mechanical Engineers.



Houston
Lighting
& Power
Company

Electric Tower
P.O. Box 1700
Houston, Texas 77001

June 5, 1979
SFN: V-0540
ST-HL-AE-349

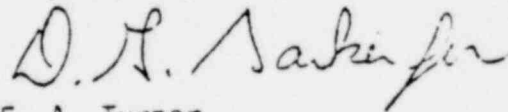
Director, Region IV
Office of Inspection and Enforcement
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76102

Dear Sir:

South Texas Project
Units 1 & 2
Docket Nos. STN 50-498, STN 50-499
Final Report on the Reportable
Deficiency Concerning Concrete Voids
In the Unit 1 Reactor Containment
Building

The attached report is submitted pursuant to the requirements of 10 CFR 50.55(e)(3). On October 20, 1978, Houston Lighting and Power notified your office of concrete voids behind the liner plate in the reactor building exterior wall. This final report provides a description of the deficiency, summary of the safety analysis and corrective actions taken to repair the voids and to prevent their recurrence. Further questions should be directed to Mr. D. G. Barker, Manager, South Texas Project at (713) 676-8891.

Very truly yours,



E. A. Turner
Vice President
Power Plant Construction
& Technical Services

LRJ:bf

cc: Director, NRC Office of Inspection & Enforcement
C. Thrash (Baker & Botts)
R. Gordon Gooch (Baker & Botts)
J. R. Newman (Lowenstein, Newman, Reis, Axelrad & Toll)
D. G. Barker
A. J. Granger
R. A. Frazar

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DUPLICATE

7906120390

INCIDENT REPORT
Fifteenth Lift Concrete Voids

I. SUMMARY

On October 20, 1978, Houston Lighting and Power Company (HL&P) notified the Nuclear Regulatory Commission (NRC) of a reportable deficiency under 10 CFR 50.55(e). This deficiency concerned the existence of concrete voids within Lift 15 behind the liner plate in the Unit I Reactor Containment Building exterior wall from El. 127'-0" to El. 138'-0". On November 20, 1978, an interim report regarding this deficiency was submitted to the NRC. Investigations have been conducted to determine the extent and location of all unacceptable areas. Repairs to restore the structure to the original level of safety have been completed. The repair methods were tested and the results analyzed prior to their implementation. This deficiency was caused by the compounded effects of inadequate planning for a large and complex pour, an unusually long pour time, longer than normal slick lines and concrete pump breakdowns. If left uncorrected, these voids could have compromised the structural integrity of the containment in that the containment as built could not have met its design load criteria.

II. DESCRIPTION OF INCIDENT

A. Identification

The Reactor Containment Building Unit I shell wall pour CSI-W15 showed honeycombing on the outer surface and visible voids between the liner plate and containment wall.

B. Extent

The voids were in a random pattern and existed throughout the circumference of the lift.

C. Date and Means of Obtaining Information

The voids were discovered at the final inspection of the pour by QC inspectors and reported on NCR S-1219 on December 5, 1978.

D. Unusual Circumstances

This was an unusually long pour (over twenty hours), the pump broke down several times contributing to the time factor than should have been used, and preceding fourteen. Structural crane rail protruded into the

E. Status of Construction

Fourteen preceding successful had been completed. Lift 15 was of the polar crane rail.

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DUPLICATE DOCUMENT

Entire document previously entered into system under:

ANO

7906120397

No. of pages:

16