U. S. NUCLEAR REGULATORY COMMISSION

OFFICE OF INSPECTION AND ENFORCEMENT

Division of Quality Assurance, Vendor, and
Technical Training Center Programs
Quality Assurance Branch

Report No.: 50-498/85-14

Docket No.: 50-498

Licensee: Houston Light & Power Company

Facility Name: South Texas Project Unit 1

Inspection At: Stone and Webster Engineering Corporation, Boston, MA

Inspection Conducted: July 22-26, 1985

Inspection Team Members:

| | |
|---|---|
| Team Leader: | E. V. Imbro, Senior Inspection Specialist, IE |
| Mechanical Systems: | T. DelGaizo, Consultant, WESTEC Services |
| Mechanical Components: | R. Parkhill, Inspection Specialist, IE<br>S. Gula, Consultant, Harstead Engineering |
| Electrical: | C. Crane, Consultant, WESTEC Services |
| Instrumentation and Controls: | J. Kaucher, Consultant, WESTEC Services |

D. Parkhill for
Eugene V. Imbro
Team Leader, IE

8/23/85
Date

Approved by: James L. Milhoan
James L. Milhoan
Section Chief
Quality Assurance Branch, IE

8/27/85
Date

SOUTH TEXAS PROJECT - UNIT 1
INSPECTION OF AUDIT RESULTS; TASKS 85-1 AND 85-2
JULY 22 THROUGH 26, 1985

1. Background

On March 1, 1984, representatives of Houston Lighting and Power Company (HL&P) presented to the NRC the details of the Engineering Assurance Program (EAP) being conducted on the South Texas Project (STP). As a result of this meeting and additional information provided by HL&P, the NRC determined that this program, if properly implemented, could provide the additional assurances of design adequacy normally provided by an Independent Design Verification Program (IDVP). Formal acceptance of the EAP as a substitute for an IDVP was provided via letter to HL&P dated August 20, 1984.

The NRC decided to monitor the STP Engineering Assurance Program in three phases for Task 85-1, Control Room HVAC and Task 85-2, Component Cooling Water System: (1) implementation of the program plan and procedures, (2) review and evaluation of audit results, and (3) follow-up of corrective action. The first phase of inspection was accomplished at the headquarters of Stone and Webster Engineering Corporation (SWEC) in Boston during the week of April 23, 1985. The report of this inspection (No. 50-498/85-09) was forwarded to HL&P on July 12, 1985 (B. K. Grimes, NRC to J. H. Goldberg, HL&P).

2. Purpose

The purpose of this inspection was to review and evaluate audit results for Tasks 85-1 (Control Room HVAC System) and 85-2 (Component Cooling Water System). Specifically, the objectives of the inspection were: (1) to verify that Tasks 85-1 and 85-2 were performed in sufficient technical depth to achieve objectives of the EA Program; (2) to verify that the background documentation supported the findings and conclusion of the reports; and (3) to review the status of items identified by the NRC in Inspection Report 85-09.

3. NRC Inspection Items

| Assignment | Name, Position |
|---|---|
| Team Leader | E. Imbro, Senior Inspection Specialist, IE |
| Mechanical Systems | T. DelGaizo, Consultant, WESTEC Services |
| Mechanical Components | R. Parkhill, Inspection Specialist, IE |
| | S. Gula, Consultant, Harstead Engineering |
| Electrical Power | C. Crane, Consultant, WESTEC Services |
| Instrumentation and Controls | J. Kaucher, Consultant, WESTEC Services |

4. Personnel Contacted

The following is a brief list of key personnel contacted during this inspection:

| Name | Organization | Position |
|---|---|---|
| R. Frazar | HL&P | EA Program Manager |
| S. Basu | HL&P | EA Program Staff |
| M. Chakravorty | HL&P | EA Program Staff |
| P. Garfinkel | SWEC | VP & Sr. Eng. Manager |
| A. Banerjee | SWEC | STP EA Proj. Manager |
| J. Hendrie | HL&P | EA Oversight Committee |
| R. Laney | HL&P | EA Oversight Committee |
| H. Woodson | HL&P | EA Oversight Committee |

5. General Conclusions

a. Based on this review, the NRC found that Tasks 85-1 and 85-2 were acceptably completed subject to comments contained in this report. The SWEC review was comprehensive, checksheets were thoroughly completed, files were in good order, and backup documentation was auditable and supported SWECs findings and conclusions. Subsequent NRC inspection will focus on resolution of action items and implementation of corrective actions.

b. Specific comments identified in Inspection Report 50-498/85-09 were reviewed by the NRC during this inspection. All items were closed out with exception of item I.2.b, which will be verified during the next inspection. Also, items I.4.d and II.2 were closed out based upon commitments to include these items in future EAP Tasks. Details regarding disposition of all previous inspection items are given in Attachment 1 to this report.

6 Specific Comments

Specific comments on a technical discipline basis are included in Attachment 2 to this report.

ATTACHMENT 1

SOUTH TEXAS PROJECT

DISPOSITION OF PREVIOUS INSPECTION ITEMS

DISPOSITION OF PREVIOUS INSPECTION ITEMS
INSPECTION NO. 50-498/85-09

| Item No. | Status | Reason |
|---|---|---|
| I.1 | Closed | A detailed review of documentation for Task 85-2 indicated most documents were prepared in 1983 and earlier. With regard to Task 85-1, the decision to review Control Room HVAC was made in late November 1984 (as documented by a SWEC letter to HP&L dated 11/16/84 recommending the review) and most Task 85-1 design documents were dated prior to that time. |
| I.2.a | Closed | The reference documents were obtained (through RFI-85-1-28) and were reviewed by SWEC. |
| I.2.b | Open | The referenced architectural drawing did not contain specific dimensional information for SWEC's review. This dimensional information will be verified during our forthcoming inspection in Houston. |
| I.2.c | Closed | STP project engineering has been requested to resolve this item by HP&L EA in Action Item No. 14.5 |
| I.2.d | Closed | There was sufficient evidence that these items and similar calculational input and assumptions were being reviewed and evaluated by SWEC. With regard to the location of radiation detectors, the location is fixed by the calculation and drawings. Any change in this location will require a formal design change. |
| I.3.a | Closed | There was sufficient evidence of review of single failure considerations, including a finding associated with Task 85-1. This finding was forwarded to STP by finding No. 47.2. |
| I.3.b | Closed | SWEC identified justification of the assumption as a concern to be resolved in the electrical discipline review for EAP Task 85-1. |
| I.4.a | Closed | Data sheets in question were from the appropriate material requisitions. |
| I.4.b | Closed | See item I.2.d, above. |
| I.4.c | Closed | See item I.2.a, above. |
| I.4.d | Closed | HL&P has committed to have SWEC review the validity of the assumption regarding loss of offsite power during a future EAP Task. |
| I.4.e | Closed | See item I.2.c, above. |

| Item No. | Status | Reason |
|---|---|---|
| II.1 | Closed | The acceptability of the BISEPS program for this application has been adequately documented by the SWEC review. |
| II.2 | Closed | HL&P has committed to review design change control at STP, for all disciplines, during a future EAP task. |
| III.1.a | Closed | The Document Review Plans were found to be traceable. |
| III.1.b | Closed | Both of the NRC concerns have been included in the EAP Task 85-1. |
| III.2.a | Closed | HL&P has committed to have SWEC obtain and review set point calculations as soon as possoble. |
| III.2.b | Closed | SWEC has identified this item for resolution by STP via DRP-85-1-6-M45, Item 3.2. Also, the deluge valve is a manual valve and has no control function. |
| III.2.c | Closed | HL&P EA has identified Action Items No. 9 and No. 55 to STP project engineering for resolution. |
| III.2.d | Closed | Several instrument loops were reviewed by SWEC as part of the CCW System Review (Task 85-2). |
| III.3 | Closed | These items pertain to Task 85-3 (Medium Voltage AC) which will be reviewed as part of a future inspection. These items have been closed based on SWEC commitments to include them in the 85-3 review. |

Note: The following items will be reviewed by the NRC in forthcoming inspections to ensure proper resolution by HL&P.

I.2.b
I.2.c
I.3.b
I.4.d
I.4.e
II.2
III.2.a
III.2.c
III.3

ATTACHMENT 2

SOUTH TEXAS PROJECT

SPECIFIC DISCIPLINE COMMENTS

## 1.0 MECHANICAL SYSTEMS

### Observation No. 1.1, Documentation of SWEC's Verification of Design Input Information

Item 3.1 of DRP-85-2-4-M19 asks, "Were the design inputs correctly specified? The answer was yes. However, some inputs were not completely traced to their sources; examples: Ref. 3 (Spec. 7R209NS034-D), coolant heater drain tank and Ref. 9 (Spec. 2V211VS001-E), RC Fan Coolers. Spot checking of the significant input information, particularly when large amount of input is involved (as was done here) is an acceptable technique; however, the documentation should reflect what was actually done and not leave an impression of a 100% review. When all input information is not verified by actual review of references, this should be so annotated on the DRP.

### Observation No. 1.2, CCW Surge Tank Environmental Conditions

Item 3.1 of DRP-85-2-5-M26 identifies discrepancies between the specification and EEQ documentation relative to CCW surge tank environmental conditions. Item 3.1 further states, "STP should revise the specification to reflect correct post-accident conditions". Since the CCW surge tank is both designed and installed, the implications of the above statement should be stated. Recommendation for corrective action in this instance should have included a statement relative to verifying that the design of the tank meets the revised post-accident environmental conditions.

### Observation No. 1.3, CCW Network Analysis

The following problems were identifed in the CCW Network Analysis (Calc. 5R209MC5858):

(a) The isometric piping diagrams were not used to verify code inputs.

(b) For node connecting elements that contain more than a single pipe size, it is not clear that the appropriate pipe ID was used to convert L/D's to equivalent pipe length.

(c) On sheets describing the node connecting elements, the nominal pipe size is specified rather than the actual pipe ID. It is not clear, however, if the actual pressure drop calcs were based on the internal diameter of piping. This was subsequently verified by SWEC; i.e., correct value was used.

HL&P committed to have SWEC review a representative sample (5 or 6) of node connecting elements by comparing them with the isometrics.

## 2.0 MECHANICAL COMPONENTS

### Observation No. 2.1, Design Change Evaluation

The EA program has not evaluated the process by which Bechtel controls design changes in the pipe stress and pipe support areas. HL&P has committed to include review of the design change process for all design disciplines in a future EAP assessment.

## 3.0 ELECTRICAL/I&C

### Observation 3.1, Internal Panel Wiring Separation

Review plans 85-1 and 85-2 do not include a review of internal panel wiring separation, but rather the review of separation requirements stops at the connection to the individual panel. HL&P has committed to including separation within panels in a future technical assessment.