



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION II
101 MARIETTA ST., N.W., SUITE 3100
ATLANTA, GEORGIA 30303

AUG 25 1980

Report No. 50-335/80-20

Licensee: Florida Power and Light Company
9250 West Flagler Street
Miami, FL 33101

Facility Name: St. Lucie

Docket No. 50-335

License No. DPR-67

Inspection at Ebasco Services Incorporated, New York, New York

Inspectors: B. R. Crowley for 8/22/80
R. M. Compton Date Signed

B. R. Crowley for 8/22/80
L. Modenos Date Signed

Accompanying Personnel: J. R. Costello, IE, RIV Vendor Inspection Branch

Approved by: B. R. Crowley for 8/22/80
A. R. Herdt, Section Chief, RCES Branch Date Signed

SUMMARY

Inspection on July 21-23, 1980

Areas Inspected

This routine, announced inspection involved 38 inspector-hours at Ebasco Services Incorporated, New York in the areas of IE Bulletin 79-14, "Seismic Analysis for As-Built Safety Related Piping Systems" and IE Bulletin 79-02, "Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts".

Results

Of the 2 areas inspected, no items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

Licensee Employees

- *C. S. Kent, Project Manager - Engineering
- *S. T. Hale, Senior Mechanical Engineer
- *S. P. Corona, QA Engineer
- *J. Krumins, Site Engineering Representative
- *L. W. Badow, QA Engineer

Other Organizations

- *J. R. Santosuosso, Assistant Chief Mechanical/Nuclear Engineer, Ebasco Services Incorporated
- *B. R. Mazo, Chief, QA Engineer, Ebasco
- F. Stomel, Senior Supervisory Engineer, Ebasco
- J. Albanes, Supervising Engineer - Strees Analysis, Ebasco
- J. Ruimerman, Supervising Engineer - Supports and Restraints, Ebasco
- N. Fan, Lead Stress Analysis Engineer, Ebasco
- *G. H. Krauss, Civil Engineer - 79-14, Site Coordinator, Ebasco

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on July 23, 1980 with those persons indicated in Paragraph 1 above.

3. Licensee Action on Previous Inspection Findings . Not inspected.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve noncompliance or deviations. New unresolved items identified during this inspection are discussed in paragraph 5.

5. (Open) IE Bulletin 79-14, "Seismic Analysis for As-Built Safety Related Piping Systems"

Ebasco procedures governing various aspects of the IE Bulletin 79-14 effort were reviewed for content and complete coverage of bulletin items. Procedures that were examined in detail included the following:

Stress Analysis Review Procedure for Compliance with NRC Bulletin 79-14, issued October 26, 1977

Criteria and Procedures for the Evaluation of Support/Restraints to Satisfy NRC Bulletin IE 79-14, issued July 16, 1980

These procedures did not address the time frames and responsibilities for evaluating nonconformances with respect to system operability and notification of the licensee as specified in IE Bulletin 79-14. Specific examples of the inspector concerns about the timeliness of evaluations, analyses and notification of the licensee of identified nonconformances are discussed later in this report. In addition it was noted that the support/restraint evaluation procedure had been issued only one week prior to this inspection; after completion of much of the support/restraint evaluation effort. These procedural inadequacies are being identified by the RIV Vendor Inspection Branch inspector in the RIV inspection report as a deviation.

The following stress problems were selected for examination of the evaluation and analysis work effort:

B. F. Shaw piping isometric SI-N-3, stress isometric SI-199-17, line 4"-SI-415, in areas RAB-1, 2 and 3

B. F. Shaw piping isometric SI-N-7, stress isometric SI-199-19, area RAB-5

Documentation examined included as-built markups, support details and checklists, valve checklists, stress analysis computer runs (calculations 676 and 871), stress analysis review lists and response spectra # curves. The following three areas of concern were identified in this examination:

- a. The stress analysis of 4 inch SI line on stress isometric SI-199-17 did not consider the effects of a 3 inch branch line. This problem was subsequently reanalyzed with the 3 inch line input and the piping and supports were found adequate. However, Ebasco committed to review all remaining problems to assure that branch lines have been properly included. This is identified as Inspector Followup Item 335/80-20-01 and will be examined during a future inspection.
- b. Another concern related to the selection of response spectra curve damping values. FSAR commitments were to use 1/2 percent damping for Unit 1. Subsequent NRR approved FSAR commitments for Unit 2 were for 1 percent damping for piping less than 12 inches in diameter and 2% damping for 12 inch diameter and above. However, for the new analyses for 4 inch diameter Unit 1 SI piping on Stress isometric SI-199-19 Ebasco used 2% damping curves. The small difference in acceleration between the different curves at the applicable periods indicates that use of the less conservative damping value will not have a significant effect on the St. Lucie analyses. However, as the use of the 2% damping valves does not meet the FSAR commitments for either Unit, this is being identified as a deviation in the RIV Vendor Inspection Branch report.
- c. For the two problems examined it was not apparent that as-built discrepancies had been evaluated, analyzed, dispositioned and reported to

FP&L for evaluation against technical specification requirements, as specified in IE Bulletin 79-14. Specifically, for stress isometric SI-199-17 nonconformances were identified in the field on August 30, 1979 that indicated detailed system stress analysis was required. The initial stress analysis indicated high support loads which were forwarded to the supports/restraints group on November 1, 1979, for evaluation of the supports. On January 26, 1980 this group reported back to the stress group that support SI-676-320 was overstressed. The system was reanalyzed without the overstressed supports and determined to be adequate on January 22, 1980. Thus it took almost six months after identification of the discrepancies until system operability under design loadings was verified. The bulletin states that, for identified nonconformances an initial engineering judgement evaluation be completed within 2 days and an analytical engineering evaluation be completed within 30 days. For stress isometric SI-199-13 the field inspection noted on October 8, 1979 that U-bolt support SIH-160A did not act in the directions shown on the stress isometric. Calculation 871, not completed until April 13, 1980, indicated that although pipe stresses were acceptable, loads on adjacent supports had increased and that a new support was required. Ebasco was unable to provide any analyses showing that adjacent supports would not fail under design loads for the as-built conditions. FP&L committed to review all modifications and document the times for identification evaluation, analysis, reporting and implementation of corrective actions. This review is to include the significance of the nonconformances in relation to system operability. This will be identified as an Unresolved Item, 335/80-20-02. Ebasco was asked to take prompt action as required to assure that the evaluation and analysis times specified in the bulletin were being adhered to for the ongoing Ebasco work for Millstone and H. B. Robinson.

No items of noncompliance were identified.

6. (Open) IE Bulletin 79-02, "Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts".

FP&L's response to IEB 79-02, Serial L-79-183, dated July 5, 1979, was discussed with licensee and Ebasco personnel. Paragraph 2 of the response stated that allowable shear and tension values for all expansion anchors was based on a factor of safety of 4 from the manufacturer's published ultimate capacities. IE Bulletin 79-02 specifies that a factor of safety of 5 should be verified for self drilling anchors. The licensee was requested and committed to submit a supplementary response showing that the Bulletin criteria were met.

Sample calculations CW-1001-14, CC-13-9 and CC-16-9, performed to determine the effects of prying action, were examined. The inspectors questioned the use of equally distributed anchor loads for these complex bolting patterns. Studies performed by Teledyne Engineering Services show that, for bolt patterns more complex than a standard four bolt arrangement, loads for the bolts nearest the attachment(s) can be much higher than for outer bolts.

The licensee was asked to address this issue for any calculations performed. These items are being identified as Inspector Followup Item 335/80-20-03.

The inspectors pointed out that new support loads resulting from the IEB 79-14 analyses should be evaluated for effects on expansion anchors.

No deviations or items of noncompliance were identified.

IE Bulletin 79-02 remains open pending submittal of supplementary responses and final reviews by NRC.