

# ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

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SUBJECT: Forwards final summary rept for IE Bulletin 79-14,  
 "Seismic Analysis for As-Built Safety-Related Piping Sys."

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**ATTACHMENT**

**SUMMARY REPORT FOR IE BULLETIN 79-14**

**SEISMIC ANALYSIS FOR AS-BUILT SAFETY RELATED PIPING SYSTEMS**

**TURKEY POINT UNITS 3 AND 4  
DOCKET Nos. 50-250 AND 50-251**

## INTRODUCTION

I&E Bulletin 79-14, "Seismic Analysis for As-Built Safety Related Piping Systems", was issued July 2, 1979. Revision 1 to the Bulletin was issued July 18, 1979. Supplement 1 to the Bulletin was issued August 15, 1979. Supplement 2 to the Bulletin was issued September 7, 1979.

In order to assure the seismic piping analyses are still valid, the Bulletin required each operating LWR to inspect all safety related/Seismic Category I systems, and compare the as-built installation with the design documents which were used as inputs to the seismic analysis. Where significant deviations are discovered, they must be resolved either by reanalysis or by modifications to the piping systems or their supports. This work was limited to piping systems of diameter 2 " and larger (or if it was computer analyzed pipe).

## BULLETIN REQUIREMENTS

The bulletin was broken down into four tasks; each licensee was required to:

1. Identify inspection elements to be used in verifying that the seismic analysis input information conforms to the actual configuration of safety related systems. For each safety related system, submit a list of design documents, including title, identification number, revision, and date, which were sources of input information for the seismic analyses. Also submit a description of the seismic analysis input information which is contained in each document. Identify systems or portions of systems which are planned to be inspected during each sequential inspection identified in Items 2 and 3. Submit all of this information within 30 days of the date of this bulletin.

FPL provided this response on August 2, 1979 by letter L-79-210.

2. For portions of systems which are normally accessible, inspect one system in each set of redundant systems and all non-redundant systems for conformance to the seismic analysis input information set forth in design documents. Include in the inspection: pipe run geometry; support and restraint design, locations, function and clearance (including floor and wall penetration); embedments (excluding those covered in IE Bulletin 79-02); pipe attachment; and valve and valve operator locations and weights (excluding those covered in IE Bulletin 79-04). Within 60 days of the date of this bulletin, submit a description of the results of this inspection. Where non-conformances are found which affect operability of any system, the licensee will expedite completion of the inspection described in Item 3.

Further clarification of this bulletin requirement was made in the August 15, 1979 Supplement.

FPL provided response to this item by letter L-79-273 dated September 26, 1979.



3. In accordance with Item 2, inspect all other normally accessible safety-related systems and all normally inaccessible safety-related systems. Within 120 days of the date of this bulletin, submit a description of the results of this inspection.
4. If non-conformances are identified:
  - A. Evaluate the effect of the non-conformance upon system operability under specified earthquake loadings and comply with applicable action statements in your technical specifications including prompt reporting.
  - B. Submit an evaluation of identified non-conformances on the validity of piping and support analyses as described in the Final Safety Analysis Report (FSAR) or other NRC approved documents. Where you determine that reanalysis is necessary, submit your schedule for: (i) completing the reanalysis, (ii) comparisons of the results to FSAR or other NRC approved acceptance criteria and (iii) submitting descriptions of the results of reanalysis.
  - C. Revise documents to reflect the as-built conditions in plant, and describe measures which are in effect which provide assurance that future modifications of piping systems, including their supports, will be reflected in a timely manner in design documents and the seismic analysis.

During the walkdowns, non-conformances were found in most piping systems. Due to the extensive workscope, FPL requested by letter L-79-273 an extension to the inspection schedule specified by the bulletin. This extension was requested for completion of inspections of the piping inside containment until the 1979/1980 refueling/maintenance outages. A formal plan for completion was then established and further tracking was coordinated through site visits by regional inspectors.

The following discussion provides a summary of the work that has been performed for completion of the requirements of I&E Bulletin 79-14.

The program implemented for bulletin completion included the following:

1. System walkdowns
2. Functionality evaluation for each system
3. FSAR analysis

The following are the systems (or portions thereof) which were identified for inspection:

1. MAIN STEAM
2. MAIN FEEDWATER/AUXILIARY FEEDWATER
3. INTAKE COOLING WATER
4. REACTOR COOLANT SYSTEM
5. CHEMICAL VOLUME & CONTROL SYSTEM
6. SAFETY INJECTION SYSTEM
7. RESIDUAL HEAT REMOVAL SYSTEM
8. CONTAINMENT SPRAY SYSTEM
9. ACCUMULATOR INJECTION SYSTEM

10. COMPONENT COOLING WATER SYSTEM
11. POST ACCIDENT CONTAINMENT VENTILATION SYSTEM
12. CONTAINMENT PENETRATION SYSTEMS
13. EMERGENCY DIESEL GENERATORS

#### System Walkdowns

All of the walkdowns were completed by June, 1981. A total of 221 stress problems were identified as needing functionality review; 211 of those required reanalysis. A total of approximately 3550 supports were identified as needing functionality review; approximately 1300 were reanalyzed. A total of 450 isometrics were identified to be redrawn to the "as-built" conditions.

#### Functionality Evaluations

Functionality evaluations were designed to determine that operability of the system would not be affected. The evaluation consisted of two phases: an engineering judgement phase (Phase 1) and an analytical engineering evaluation phase (Phase 2). The objective of Phase 1 was to determine, through the use of engineering judgement, those significant as-built deviations which would impair the safe operation of the piping system. When non-conformances were identified, a Phase 2 analytical evaluation was subsequently performed.

After completion of the functionality reviews for approximately one half of the systems outside containment, a determination was made that non-conformances would necessitate reanalysis of all remaining systems. Two non-conformances which could potentially impact safe shutdowns were identified. One non-conformance (Reportable Occurrence 250-79-26) was corrected under the requirements of the Technical Specifications. The second non-conformance was determined to be non-safety related therefore, it was not reported. The discovery of a large number of other significant non-conformances was not expected. The above information was provided to the NRC by letter L-79-273 dated September 26, 1979.

The functionality modifications were completed for Unit 4 during the October, 1981 refueling outage. The functionality modifications for Unit 3 were completed during the February 1981 through April 1982 Steam Generator Repair Outage.

#### FSAR Analysis

When functionality for a system had been established, Phase 2 of the work was performed. Phase 2 of the work was the final FSAR analysis. In all systems, the requirements of the original FSAR were to be met for this phase. Piping stress and support calculations were performed to satisfy FSAR allowables. Only a few piping systems required modifications. Supports were modified, removed, or added to satisfy the loads imposed or to reduce piping stresses. In most systems, the functionality computer analyses were re-analyzed using the revised stress allowables; supports were then modified to accommodate the calculated loads.



The majority of the FSAR modifications for Unit 4 were completed during the October, 1982 through May, 1983 Steam Generator Repair outage. The remainder were completed during the following March, 1984 through May, 1984 refueling outage. The majority of the Unit 3 FSAR modifications were completed during the October, 1983 through January, 1984 refueling outage with the remainder completed during the following March, 1985 refueling outage. This was brought to the attention of the inspector in Inspection 85-12; NRC Inspection Report 85-12 documents the NRC's acknowledgment of the modification completion.

#### UNRESOLVED ITEMS/INSPECTOR FOLLOW-UP ITEMS/VIOLATIONS

Based on the previous inspection reports and NRC Inspection Report 88-24, IEB 79-14 for Units 3 and 4 is considered closed except for the open items identified. A summary of the status of these items follows:

IFI 88-24-01: "Final Summary Report for IEB 79-14." Submittal of this document completes this item.

IFI 88-24-02: "Field Verification for New Redraw Drawings of Isometrics and Pipe Supports."

#### STATUS

A program was put in place to assure the accuracy of the new drawings. The program included walkdowns of the remaining discrepant items, resolution of these items, and development of updated isometrics. This item is considered complete.

IFI 88-24-03 "Hilti Anchor Bolt Allowables and Justifications for IEB 79-02, NRC Information Notices No. 86-94 and 88-25."

#### STATUS

A review of approximately 40 percent of the supports within the scope of IEB 79-02 and IEB 79-14 was performed with the revised ultimate tensile capacities for 1/2 inch diameter Hilti Kwik bolts. The review concluded that the use of the revised allowables did not invalidate the qualification of the supports and no physical modifications were required for any of the supports evaluated. This evaluation was completed in April 1989. This item is considered complete.

UNR 88-24-04: "Discrepancies in As-Built Drawings for Piping Systems."

#### STATUS

Item numbers 1, 7 and 9 require revisions to isometric 5613-P-597-S Sheet 3 of 3 and support drawings 5613-H-597 Sheets 28 and 38.



Item number 5 was documented and evaluated in NCR-88-0109. Support drawings 5613-H-597 Sheets 21 and 35 are to be revised, as part of the NCR disposition, during the revision stage of the In Service Inspection (ISI) redraw effort.

#### **SCHEDULE**

The revision of the drawings follows the existing ISI redraw effort schedule. This work is scheduled to be completed by the end of 1992.

#### **FUTURE INTEGRATION**

FPL has taken the following steps to improve the maintenance of Stress Analyses:

1. Identification of the need for more consistent and thorough stress analysis package documentation. A standard was developed which requires specific documentation for each package, and thereby, help to ensure consistency in future work.
2. The Engineering Department formulated a very extensive standard Engineering Design Package. This package is required for use with future modifications and has been in effect since June 28, 1985. During package preparation, engineers are required to identify the "analysis of record" for any systems being modified and verify that the stress analysis has been updated.

#### **SUMMARY**

NRC Bulletin 79-14 identified the need for utilities to maintain better documentation of plant piping systems and pipe support configurations. As described, each of the 4 bulletin specific items were resolved. Each item of concern subsequently raised by the NRC has also been addressed and resolved. Furthermore, FPL has taken additional steps for document maintenance that will ensure proper documentation of the system configuration and the seismic analysis. Items currently open are tracked until completion. Because no additional actions are required either by the bulletin or follow-up inspections, FPL considers this bulletin closed.