



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION II  
101 MARIETTA STREET, N.W.  
ATLANTA, GEORGIA 30303

Report No.: 50-413/84-34

Licensee: Duke Power Company  
422 South Church Street  
Charlotte, NC 28242

Docket No.: 50-413

License No.: CPPR-116

Facility Name: Catawba 1

Inspection at Duke Power Engineering Office, Park Road, Charlotte, NC

Inspector: <u>W. P. Ang</u>	<u>4-17-84</u>
W. P. Ang	Date Signed
<u>W. C. Liu</u>	<u>4-17-84</u>
W. C. Liu	Date Signed

Accompanying Personnel: J. J. Blake

Approved by: <u>J. J. Blake</u>	<u>4/17/84</u>
J. J. Blake, Section Chief Engineering Program Branch Division of Engineering and Operational Programs	Date Signed

SUMMARY

Inspection on March 27-30, 1984

Areas Inspected

This routine, unannounced inspection involved 57 inspector-hours on site in the areas of Piping Analysis for As-Built Safety-Related Piping Systems (IEB 79-14); Pipe Support Base-Plate Designs Using Concrete Expansion Anchors (IEB 79-02); and discussions with design personnel.

Results

Of the areas inspected, no violations or deviations were identified.

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## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- W. O. Henry, QA Manager, Technical Service
- \*C. L. Ray, Jr., Principal Engineer, Design Engineering
- \*R. M. Duilin, Senior Engineer, Design Engineering
- \*J. N. Underwood, Supervising Design Engineer
- \*R. W. Bonsall, Supervising Design Engineer
- \*D. H. Stout, Supervising Design Engineer
- \*W. R. Seldon, Supervising Design Engineer
- \*D. L. Caldwell, Supervising Design Engineer
- \*T. L. Utterback, Assistant QA Engineer, Technical Services

Other licensee employees contacted included 14 Duke Power Company and contract design engineering personnel.

\*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on March 30, 1984, with those persons indicated in paragraph 1 above. The licensee acknowledged the inspection findings.

### 3. Licensee Action on Previous Enforcement Matters

- a. (Open) Unresolved Item 83-51-01 - The unresolved item identified a need for further inspection of pipe support calculations to verify the technical adequacy of the use of "engineering judgement." Calculations for pipe supports 1A-KC-3807, 1-R-CA-232, and 1-R-CA-0091, were inspected for the technical adequacy of "engineering judgement" evaluations. In general, the use of "engineering judgement" appeared to be adequate. However, calculations for pipe support 1-R-CA-232 involved the use of "engineering judgement" for the applicable base-plate flexibility factors that did not appear to be an appropriate use of engineering judgement. This appeared to be an isolated case. However, pending further inspection to confirm that this was an isolated case and that appropriate base-plate flexibility factors are used in the calculations, the unresolved item was left open.
- b. (Open) Unresolved Item 83-51-02 - The unresolved item identified a need for further inspection to verify DPC compliance with NRR letter dated October 3, 1978, regarding Overlap Modelling for Piping Stress Analysis. Design Engineering Department Analysis Procedure CNSA-DOC79-008 Revision 1 - Catawba 1 and 2 - Procedure for Determining Math Model Boundaries for Rigorously Analyzed Piping, was reviewed. In addition, the following piping stress analysis problems were inspected.

- NC-03, NV-04, NI-20, NI-21, RNH, RNQ, CAB-5 and CA6-1. The rigorous analyses complied with the above noted NRC letter. However, during the inspection it was noted that small bore piping were being analyzed using either the DPC alternate analysis method or by an Impell program, "Quickpipe." Overlap modelling was involved in some of these analyses. The inspector was unable to verify the overlap modelling technique used for small bore piping during the inspection. In addition, the need for verification of the "Quickpipe" computer program was not established. Pending further inspection in the above noted area, the unresolved item was left open.

#### 4. Unresolved Items

Unresolved items were not identified during this inspection.

#### 5. Seismic Analysis for As-Built Safety-Related Piping Systems (IEB 79-14) and Pipe Support Base-Plate Designs Using Concrete Expansion Anchors (IEB 79-02)

A follow-on inspection to the NRC RII inspection documented in inspection Report No. 50-413/84-19 was performed to verify licensee compliance with IEB 79-14 and IEB 79-02 requirements and licensee commitments. On February 29, 1984, and December 15, 1983, the licensee submitted its final response to IEB 79-14 and IEB 79-02, respectively.

During routine plant inspections, the resident inspector noted that operator motors for valves IND/091, INI 184B and INI 185A appeared to need supports based on the apparent mass of the operators. The licensee had evaluated the resident inspector's observations, reported the evaluation, and concluded that no additional supports were required. During this inspection, applicable valve assembly (including operator) drawings, valve stress reports, valve specifications, and piping stress analyses were reviewed to determine the adequacy of the supports for the valve. The above noted documentation confirmed the adequacy of the valve, valve operator, and applicable support design.

The following "alternate analysis" piping stress analysis calculations were randomly selected and inspected. The pipe support calculations for the corresponding piping system segments were also inspected: Problem No. CN-1492-NB 249, Problem No. CN-1492-NB 247, and Problem No. CN-1492-NV 151.

No violations or deviations were identified.

Catawba Unit 1 utilized numerous typical pipe support designs. The typical pipe support designs being used for Unit 2 are being minimized to reduce confusion arising from the number of typical supports. Design calculations for supports CN-AA-060 and CN-AA-019 were randomly selected and inspected.

No violations or deviations were observed.

Pending licensee completion of IEB 79-02 and IEB 79-14 requirements and licensee commitments, the bulletins were left open. No violations or deviations were identified.

#### 6. Discussions With Design Personnel

Prior to February 1983 small bore piping design calculations were performed using the alternate analysis criteria, a conservative hand calculation method. Since February 1983 small bore piping calculations have been done using the computer program "Quickpipe".

Five piping and pipe support design personnel and a group leader were randomly selected and interviewed to determine their technical experience, technical training, and awareness of QA requirements. Based on the discussions with the individuals interviewed, the following observations were perceived by the inspectors.

- a. The designers appeared to be technically qualified to perform their assigned tasks and generally expressed confidence in the conservatism of the alternate analysis criteria and pipe support design requirements.
- b. In addition to the required indoctrination and QA Manual training, the designers stated that they received on-the-job training on the alternate analysis criteria from their supervisors and/or from the more experienced designers in the group. One of the designers interviewed had received more formalized training on the alternate analysis criteria. The licensee did not maintain records on the above noted technical training.
- c. All personnel interviewed expressed an awareness of the QA Manual requirements for independent verification functions of a checker. However, checker assignment was stated to be less formalized for DPC designers than for contract personnel. Minimal supervisory control was expressed for checker assignment for DPC personnel. This was a perceived weakness in that it also weakened the controls for independence of the checker. The licensee's QA Manager acknowledged the perceived weakness.
- d. All the personnel interviewed stated that they went to the plant any time they needed to. The proximity and accessibility of the plant for the designers was a perceived strength.

No violations or deviations were observed.

#### 7. Inspector Follow-up Items

(Closed) Inspector Followup Item 413/83-35-01, identified a lack of Design Engineering QA Manual (DEQAM) controls concerning NRC Regulatory Guide 1.64 requirements. Revision 19 of PR-101 of the DEQAM was reviewed. The inspector had no further questions regarding the inspector followup item and closed the item.