



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

50-280

JUL 13 1979

LICENSEE: Virginia Electric and Power Company (VEPCO)

FACILITY: Surry Unit No. 1

SUBJECT: SUMMARY OF MEETING HELD ON JUNE 21 AND 22, 1979 TO REVIEW  
PIPE STRESS ANALYSES

The subject meeting was held with VEPCO and Stone and Webster (S&W) to review the modifications required to pipe supports resulting from pipe stress reanalyses or "as-built" verification.

A list of attendees is attached (Attachment 1). The following table lists the supports which we reviewed in detail and gives the reason for the modification. Attachment 2 provides details of the modifications for each problem.

| <u>Problem No.</u> | <u>System</u> | <u>Reason</u>         |
|--------------------|---------------|-----------------------|
| 508                | RHR           | Seismic               |
| 540                | RHR           | Seismic               |
| 548A               | C&RS          | As-Built Verification |
| 555*               | LHSI          | As-Built Verification |
| 562                | C&RS          | As-Built Verification |
| 630                | PSR           | Thermal               |
| 731A*              | LHSI          | As-Built Verification |
| 731B*              | LHSI          | As-Built Verification |
| 743                | LHSI          | As-Built Verification |

REGULATORY DOCKET FILE COPY

\*Supports overstressed

At this time, 42 analyses are being analyzed by S&W, of which 35 are complete, 4 are under QA review and 3 are yet to be submitted to QA. Eleven problems require modification, nine of which are discussed above and two for which details are not available.

Memorandum

Twenty-seven analyses are being performed by Nuclear Services Corporation (NSC) in California. Twenty-one analyses are complete. Nine of the 21 completed analyses require modifications to correct overstress

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Meeting Summary for Surry 1

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and/or support overstress. These modifications were not analyzed at this time.

*J. D. Neighbors*  
J. D. Neighbors, Project Manager  
Operating Reactors Branch #1, DOR

Attachments:  
As Stated

cc: w/attachments  
See next page

Docket File  
NRC PDR  
Local PDR  
NRR Reading  
ORBI Reading  
H. Denton  
E. Case  
D. Eisenhut  
G. Zech  
W. Gammill  
J. Miller  
L. Shao  
R. Vollmer  
W. Russell  
B. Grimes  
T. J. Carter  
T. Ippolito  
R. Reid  
A. Schwencer  
D. Ziemann  
V. Noonan  
P. Check  
G. Lainas  
G. Knighton  
Chief, Systematic Evaluation Branch  
Project Manager  
DOR Licensing Assistant  
OELD  
OI&E (3)  
R. Fraley, ACRS (16)  
Program Support Branch  
TERA  
J. R. Buchanan  
NRC Participants  
Mr. Michael W. Maupin  
Hunton and Williams  
Post Office Box 1535  
Richmond, Virginia 23213

Swem Library  
College of William and Mary  
Williamsburg, Virginia 23185

Donald J. Burke  
U. S. Nuclear Regulatory Commission  
Region II  
Office of Inspection and Enforcement  
101 Marietta Street, Suite 3100  
Atlanta, Georgia 30303

LIST OF ATTENDEES

NRC

D. Neighbors  
A. Lee  
W. Russell

VEPCO

W. Spencer  
C. M. Robinson

S&W

W. Chamberlain  
P. Wild  
D. King  
B. Crowe  
D. Esielionis  
R. Hankinson  
P. Papi  
E. Homer

DESCRIPTION OF MODIFICATIONS

Problem 508, Residual Heat Removal System

To reduce pipe stresses at the elbows on the discharge side of the RHR pumps 1A and 1B modifications are required. The overstressed condition occurs in the low pressure portion of the piping system. Four supports are required - two on the pump's discharges and two on the suction. Some snubbers were found to be overloaded on the suction line. (The supports for the suction MOVs required two additional snubbers between MOVs.) One snubber was required between the MOV and common suction line. See also VEPCO letters dated June 12 and 18, 1979.

Problem 540, Residual Heat Removal System

Additional support was found between A-15 and C-19 anchors. Also C-19 was a 3-way vice a two-way direction support. Rod hangers were removed since C-19 was 3-way to reduce thermal stress. The two inch relief line had not been modeled between A-15 and C-19. The main line was four inches. Inertial stress required addition of anchor six feet from two inch relief valve to account for seismic loading which previously had not been considered (interaction of two inch to four inch line).

Problem 548A, Containment and Recirculation Spray

The modification is required because of the as-built condition. The difference was a lateral displacement of six feet in a 13-1/2 foot run of ten inch pipe. In addition, a ten inch check valve and a 10 x 8 inch reducer are located in the lateral displacement. Pipe was previously modeled as a smooth bend with the reducer and valve nearer anchor point. A horizontal snubber was added to reduce pipe displacement and inertial stress near inside wall of containment (anchor) which was near "new" bends (as-built bends). Deviations are significant and would require reanalysis in accordance with S&W procedures. All changes of more than six inches in support location, pipe length, etc. require reanalysis.

Problem 555, Low Head Safety Injection System

This modification is required because of the as-built condition. As-built verification erroneously classified three supports as "vertical/lateral" which were "vertical" only. These were subsequently determined to be vertical only and the analysis was satisfactory. Use of single lateral shock suppressor was selected to prevent thermal load problems. Pipe stress was satisfactory. Movement on the anchor was significant

due to fifteen foot moment arm (12" pipe) and no lateral support. Original SHOCK 2 moment was 70,000 ft-lb: after addition of shock suppressor was 7,000 ft-lbs. [70,000 ft-lb. moment is unacceptable today].

#### Problem 562, Containment and Recirculation Spray System

Anchor on spray ring header - The original design was located at riser Tee. The actual design was located 6'6" to one side of the Tee. The result was that the segment of ring header must be included in model.

Also, the riser pipe original design consisted of a short run of pipe with one bend. Actual field run has three segments with one segment being 15'8" long. The original design had two pieces of pipe with one bend whereas the actual has four pieces with three bends.

The original analyses (SHOCK 2) was based upon typical ring. Because of as-built differences, all were reanalyzed.

Modifications consist of changing a rod hanger to a spring hanger because of thermal loading and adding a vertical constraint in place of a spring hanger (would have seismic overstress without constraint).

#### Problem 630, Pressurizer Spray and Relief System

Vertical pipe from PORV to Flash Tank is supported from building structure. Code safety relief line discharge (supported on pressurizer head) forms lateral (45°) intersection with next pipe run. Two inch thermal growth in pressurizer results in thermal stress at upper lateral section 45° intersection. By removing anchor below lower lateral, more flexibility was obtained resulting in less stress. Overstress was caused by applying stress intensification factor as currently required.

This piping, according to mill certification is better than the code minimum.

#### Problems 731A and B, Low Head Safety Injection System

The modifications to these systems result from as-built verification. Axial movement of support plus flexibility of support resulted in about 12 inches axial support movement. The modification involves adding a diagonal brace and is necessary to get within limits of pipe stress analysis assumptions.

Problem 743, Low Head Safety Injection System

This modification results from as-built verification. In the original analyses the support was four feet from elbow. The actual location is 17'8" from elbow. Existing support was shimmed three inches on each side plus stiffened to transfer load in lateral direction. There was about three to four inches of displacement of pipe prior to stiffening.

Meeting Summary for Surry 1

- 2 -

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and/or support overstress. These modifications were not analyzed at this time.

J. D. Neighbors, Project Manager  
Operating Reactors Branch #1, DOR

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As Stated

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See next page

|         |                            |                            |  |  |  |  |
|---------|----------------------------|----------------------------|--|--|--|--|
| OFFICE  | DOR: <sup>EP</sup> OPD     | DOR: <sup>EP</sup> SEP WTR |  |  |  |  |
| SURNAME | J D Neighbors: j W Russell |                            |  |  |  |  |
| DATE    | 07/13/79                   | 07/11/79                   |  |  |  |  |