(4)

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

November 2, 1979

Mr. James P. O'Reilly, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region II - Suite 3100
101 Marietta Street
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 - PIPING ANALYSIS MAY CONTAIN ERRONEOUS SUPPORT LOADS - CEB 79-30 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. W. Wright on October 4, 1979, in accordance with 10 CFR 50.55(e). Enclosed is our final report.

If you have any questions concerning this matter, please get in touch with D. L. Lambert at FTS 857-2581.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosure
cc: Mr. Victor Stello, Jr., Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

1/19/81 Telcon with D. Terriol (TVA) problem limited strickly to special output as values were not used at other points in the analysis.
1/21/81 Telcon with M. Hartman (MEB) They are not interested in looking at change. However, they will most likely be sending TVA the benchmark programs.

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ENCLOSURE

BELLEFONTE NUCLEAR PLANT
PIPING ANALYSIS MAY CONTAIN ERRONEOUS SUPPORT LOADS
NCR CEB 79-30
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

During review of piping analysis problems for the Bellefonte main steam system, an error was detected in the piping analysis computer program (TPIPE) which was being used for the analysis. TPIPE is a piping analysis program that was developed jointly between TVA and PMB Corporation of San Francisco, California, and was to be the primary tool for future piping analyses for all TVA plants.

The TPIPE program was outputting incorrect snubber loads in the TPIPE Postprocessor Dynamic Snubber Support Table. The Dynamic Snubber Support Table is output by TPIPE in a special printout. All snubber loads in the normal printout were correct. The incorrect snubber loads were generated only from time history analysis. Response spectra snubber loads were not affected.

Safety Implications Statement

Had this deficiency gone uncorrected, the design of dynamic snubbers would have incorporated this incorrect load table and would have been incorrectly designed for both safety and nonsafety systems. Due to the nature of the problem, the exact implications on the plant cannot be determined. However, incorrect snubber design could result in overstressing and possible failure of the systems during accident and/or seismic events. If such failure occurred on a safety system, the safe operation of the plant could have been jeopardized.

Corrective Action

The program error has been found and corrected. Incorrect snubber loads could have been printed only for three piping analysis problems which have been performed on the Bellefonte main steam system. Of these three, only one had been issued. It has since been voided. All three problems will be reanalyzed using the corrected version.

The special printout option of TPIPE is only available to TVA. Therefore, the incorrect portion of TPIPE has not been used to analyze any nuclear plant outside of TVA. Internal investigation by TVA has shown that the incorrect portion of TPIPE has affected only the aforementioned three problems related to the Bellefonte Nuclear Plant.

Bellefonte — IE Rpt 438-439/79-26

vital power distribution system (vital batteries) in event of loss of offsite power to prevent such an occurrence. RII has no further questions regarding this matter at this time.

c. (Open) Item 438/79-26-02: Ring girder concrete voids. RII received the licensee initial notification and first interim report on the subject deficiency on September 28, 1979, and October 26, 1979, respectively. TVA review to date disclosed that two of the four suspect void areas are acceptable without repair. Several alternative methods of repair for the two remaining suspect areas are being investigated but a final disposition has not been chosen. TVA expects to submit another report on this matter by December 14, 1979.

d. (Open) Item 438/79-26-03: Erroneous piping support loads. The licensee initially reported the subject deficiency to RII on October 4, 1979, and submitted a final report on the matter dated November 2, 1979. During review of piping analysis problems for the Bellefonte main steam system, an error was detected in the piping analysis computer program (TPIPE) which was being used for the analysis. The TPIPE program was outputting incorrect snubber loads in the TPIPE Postprocessor Dynamic Snubber Support Table. The program error was reported found and corrected. The incorrect snubber loads were found to effect only three Bellefonte main steam piping analysis problems of which only one had been issued. It has since been voided and all three problems are to be reanalyzed using the corrected version. This item remains open pending RII's examination of the corrected computer piping program.

e. (Closed) Item 439/79-13-04: Rebar failing below strength requirements. TVA initially notified RII on May 22, 1979 of the subject deficiency and submitted a final report on this matter dated June 22, 1979. Investigation revealed that the rebar used in the failed sister splices came from the reinforcing bar yard cutoff pile (excess rebar removed during fabrication) and was not representative of the rebar used in the permanent structure. Also, the portion of the structure where the sister splices were located was investigated assuming rebar with the lower yield. The investigation demonstrated that the ability of this part of the structure to carry all design loads would not have been impaired. To preclude recurrence procedure BNP-QCP-2.6 Rev. 4, entitled, "Cadweld Inspection" was amended. Addendum No. 2 to the subject procedure requires sister splice rebar to be of the same lot of material, and be exposed to the same environmental conditions as the production rebar. RII has no further questions regarding this matter at this time.

f. (Open) Item 438-439/79-20-02: Deficiencies in Penn Ventilator Company (PVC) QA program. RII received TVA's second interim report dated September 10, 1979 on this matter. TVA has requested detailed drawings from PVC and the licensee has committed to review these drawings and the seismic and environmental qualification documentation

10700

TENNESSEE VALLEY AUTHORITY CER '79 1004 002

DIVISION OF ENGINEERING DESIGN

NONCONFORMANCE REPORT

REPORT NO. CER 79

PROJECT Bellefonte	PLANT N/A	UNIT 1
PREPARER/ORGANIZATION/DATE B B Neely / EN DES CER / 10/2/79		

DESCRIPTION OF CONDITION

Two ASME Section 3 class 2 piping analyses may contain erroneous support loads.

DATE OF OCCURRENCE EST(), ACT.( ) 9/21/79	ECN REQUIRED YES ☐ NO ☒
METHOD OF DISCOVERY Found during subsequent anal.	SIGNIFICANT CONDITION ADVERSE TO QUALITY YES ☒ NO ☐
UNID CODE (EP-8.01) 1GGN415MK Tb	
SCHEDULE IMPACT P ☐ A ☒ N ☐	BRANCH CHIEF/DATE [signature] 10-3-

ASSIGNABLE CAUSE:

A post-processor program to the finite element computer code (T-PIPE) currently used by TVA in performing ASME Section 3 piping analyses, appears to be selecting inappropriate forces when combining various load conditions for tabulating support loads. This appears to occur only for time-history solution techniques.

CORRECTIVE ACTION:

The two problems which were in the process of issue have been withdrawn from the issue cycle and the problem being analyzed when this apparent nonconformance was discovered are being held until a resolution is made.

LABOR EST(), ACT.( ) 60 MH	SCHEDULE EST(), ACT.( ) 15 days
ACTIVITY NO. N/A	TASK DESCRIPTION N/A
DATE IMPLEMENTED	C/A COMPLETE: BRANCH CHIEF/ORG/DATE

ACTION REQUIRED TO PREVENT RECURRENCE:

If the suspected nonconformance is real, the problem is internal to the post processor program. In this event the program will be corrected and verified before further use will be allowed.

COMPLETION VERIFIED BY BRANCH CHIEF/ORGANIZATION/DATE

REMARKS:

Notification has been sent to other TVA potential users of this program option with an appropriate caution.

DISTRIBUTION:
- QEB QA GROUP-ENGINEERING SECTION
- OEDC QA
- MEB-NLS (For Significant NCR's)*
- MEDS

*Handcarry copy to MEB-NLS also.

NCR CLOSED:

CHIEF, QUALITY ENGINEERING BRANCH — DATE

QEB USE

[illegible] October 5, 1979

FACILITY	NOTIFICATION	ITEM OR EVENT	REGIONAL ACTION
REACTOR CONSTRUCTION			
Bellefonte 1 DN: 50-438	Telecon 10/4/79	Potential CDR - Erroneous Piping Support Loads Two separate ASME Section III, Class 2 piping analyses for Units 1's main steam system may contain erroneous support loads. The program appears to be selecting inappropriate forces when ~~containing~~ combining various load conditions for ~~laboratory~~ tabulating support loads. This appears to occur only for the time history integration technique that has been used only at Bellefonte by TVA. A written report is due 11/3/79.	Followup per NC 2512.

NCR # CEB 79-30

GENERAL: