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SUBJECT: Forwards clarification & update to program for qualifying seismic qualification of small bore piping.

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JUN 30 1989

U.S. Nuclear Regulatory Commission
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Gentlemen:

In the Matter of) Docket No. 50-260
Tennessee Valley Authority)

BROWNS FERRY NUCLEAR PLANT (BFN) - UNIT 2 - SEISMIC QUALIFICATION OF SMALL BORE PIPING (NRC TAC NO. 00305)

This letter describes the program for the Seismic Qualification of Browns Ferry Unit 2 Small Bore Piping. It supplements our previous submittal of April 29, 1988, providing further clarification of the pre and post unit 2 restart program scope.

As a brief background, a Nonconformance Report (NCR) and a Significant Condition Report (SCR) were written to address deficiencies in the criteria for routing and installing small bore piping. NCR BFNMEB 8406 was written to address the application of the criteria to the installation of schedule 160 small bore piping. SCR BFNCEB 8520 was written to address deficiencies in the support details included in the criteria.

The enclosed report (enclosure 1) describes our program regarding the Seismic Qualification of Small Bore Piping. Enclosure 2 contains a list of commitments.

If any questions exist, please telephone Patrick P. Carier, Manager of Site Licensing, at (205) 729-3570.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

M J Ray for

Manager, Nuclear Licensing
and Regulatory Affairs

Enclosures
cc: See page 2

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U.S. Nuclear Regulatory Commission

JUN 30 1989

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ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT
UNIT 2
SMALL BORE PIPING AND SUPPORTS
JUNE 1989

This report is to clarify and update TVA's program for qualifying seismic Class I small bore piping at Browns Ferry Nuclear Plant (BFN) and supersedes TVA's submittal to the NRC on the small bore program, dated April 29, 1988. The scope of the program presented in this report was discussed in the TVA/NRC meeting on November 17, 1988.

ISSUE

Significant condition reports have questioned the adequacy of base plates, concrete anchors, weld details, and structural integrity of supports for safety-related small bore piping. These questions revolve around the criteria used to design and install those supports.

BACKGROUND

The majority of the Class I small bore (one-half to two-inch diameter) piping at BFN was field routed and field supported. Installation was in accordance with American National Standards Institute standards. Two criteria were issued for BFN small bore piping design. The first design criteria was "Design Criteria for Supporting Process Instrument Air Lines," dated May 3, 1971. The other was "Criteria for Seismically Qualifying Field Run Piping - Sizes 1/2 through 2 in.," which was issued on November 29, 1972. Both criteria were reissued as controlled document BFN-50-712 in 1980.

In 1984, a nonconformance report (NCR BFNMEB 8406) was written on the application of BFN-50-712 to the installation of schedule 160 pipe since the schedule 160 pipe was not addressed in this design criteria. While revising BFN-50-712 to address schedule 160 pipe, it was determined that the qualification of some base plates in the typical support details of the criteria could not be verified and that no weld details had been specified. It was also determined that some support members for field routed schedule 160 piping could be under-designed since their selection was based on the tables in the design criteria for schedule 40 and 80 piping. A significant condition report (SCR BFNCEB 8520) was written addressing those conditions and BFN-50-712 was revised to place the support details on hold pending the resolution of the SCR.

RESOLUTION

In order to address the above concerns regarding the seismic qualification of Class I small bore piping, detailed analysis in accordance with design criteria was performed on 30 representative piping problems and for 130 associated supports. The results of the analyses were evaluated to identify attributes which cause qualification concerns with the piping and supports. The remaining piping and support installations within the scope of this program are being evaluated against these attributes through an engineering walkdown. For the piping and supports where these attributes are found to exist, further evaluations are performed to ensure the ability of the piping or supports to meet criteria requirements.

The small bore piping program is being completed in two phases as discussed below. Phase 1 is required prior to Unit 2 Cycle 5 restart. Phase 2 will be performed post-restart.

Phase 1 (Pre-Restart)

The scope for Phase 1 of this program is the seismic class I Unit 2 and common small bore piping and supports within the Design Baseline Program Safe Shutdown Restart Boundary which includes an approximate total of 27,000 ft. of piping and 4,000 supports. Those items within this boundary which do not meet the interim operability criteria (BFN-50-C-7303) are modified to meet the long term design criteria (BFN-50-C-7103 and BFN-50-C-7107) prior to restart. Those items which do not meet the long term design criteria but are within the interim operability criteria will be modified post restart (Phase 2).

In February 1989, changes to the seismic long term design criteria and new seismic Amplified Response Spectra (ARS) required an evaluation of all work completed to date on this program. Additional modifications resulting from this re-evaluation will be implemented in accordance with the above requirements. No additional attributes were identified due to the new ARS/seismic criteria re-evaluation of the original 30 analyses.

Small bore piping excluded from this program previously because engineering calculations existed are also being re-evaluated for impact of the new ARS/seismic criteria requirements. Modifications resulting from this re-evaluation will be implemented in accordance with the above requirements.

Phase 2 (Post-Restart)

The scope for Phase 2 of this program is seismic class I, Unit 2 and common small bore piping and supports outside the Design Baseline Program Safe Shutdown Restart Boundary, which includes an estimated total of 8,000 ft. of piping and 1,200 supports. This remaining seismic class I piping will be evaluated post-restart. As in Phase 1, an attributes walkdown and further evaluations will be performed to identify the piping and supports which do not meet design criteria. Items which do not meet the design criteria will be modified prior to the Unit 2 Cycle 6 restart.

CRITERIA

Interim operability criteria BFN-50-C-7303 and long term design criteria BFN-50-C-7103 and BFN-50-C-7107 are being used for this program. These criteria have previously been reviewed by the NRC staff.

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Enclosure 2

List of Commitments

BFN Unit 2 Small Bore Piping

1. Pre-Restart - Small bore program scope is the Seismic Class I, Unit 2 and common small bore piping and supports within the Design Baseline Program Safe Shutdown Restart Boundary. Items within this boundary which do not meet the interim operability criteria will be modified to meet the long term criteria prior to restart.

2. Perform modifications to small bore piping and supports, resulting from re-evaluations of existing work, following revisions to the seismic long term design criteria and new Seismic Amplified Response Spectra. Modifications resulting from this re-evaluation will be implemented in accordance with the above defined requirements.

3. Post-Restart - Small bore program scope is Seismic Class I, Unit 2 and common small bore piping and supports outside the Design Baseline Program Safe Shutdown Restart Boundary. An attributes walkdown will be performed to identify the piping and supports which do not meet design criteria. Items which do not meet the design criteria will be modified prior to the unit 2 cycle 6 restart.

4. Small bore commodities from the pre-restart scope (items 1 and 2 above) which do not meet the long term design criteria, but are within the interim operability criteria will be modified prior to the unit 2 cycle 6 restart.

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