

TENNESSEE VALLEY AUTHORITY

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U.S. Nuclear Regulatory Commission
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Gentlemen:

In the Matter of) Docket Nos. 50-327
Tennessee Valley Authority) 50-328

SEQUOYAH NUCLEAR PLANT (SQN) - NRC INSPECTION REPORT NOS. 50-327, 328/88-12 -
UNRESOLVED ITEM (URI) 88-12-02

Enclosure 1 is TVA's response to the subject URI that addressed allowable
loads for standard component supports.

A summary statement of the commitment contained in this submittal is provided
in Enclosure 2. Please direct questions concerning this issue to
B. S. Schofield at (615) 843-6172.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

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ENCLOSURE 1

Unresolved Item (UKI) 88-12-02 - Allowable Loads for Standard Component Supports

ITEM DESCRIPTION: (Excerpt from Inspection Report 88-12)

"TVA has specified allowable loads for standard component supports in SQN-DC-V-2' 2, Figure I-2 that allows the use of load rating provisions of the ASME Code to establish allowable limits. The staff has accepted the use of these allowable limits for restart (Reference 44) but the staff still has an open issue with TVA's demonstration that these allowable loads meet the Sequoyah FSAR allowable limits."

RESPONSE:

This URI deals with the development and application of allowable loads for standard component supports. In addition, this URI indicates that the allowable loads were acceptable for restart but had not been resolved as to the appropriate long-term criteria. This response defines TVA's position relative to standard component support allowables and the basis for these allowables. For convenience and clarity, this response has been divided into the following four parts:

- U-bolts
- Unistrut clamps
- Snubbers
- Standard support components (other than U-bolts, unistrut clamps, and snubbers)

U-Bolts

TVA has issued Design Standard DS-C1.6.13, "Design of U-Bolt Clamps for Piping and Tubing." This design standard provides allowable loads developed in accordance with requirements (load rating) of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section III, Subsection NF, including the Winter 1974 Addenda. In addition, the design standard allowable loads include consideration of a one-eighth-inch deflection limitation, lower bound test values (cinched or uncinched), and the use of a linear interaction equation.

TVA is in the process of evaluating the new load ratings (allowables) relative to previously completed and future work. Preliminary assessments indicate that the design standard need not be applied to previously completed work but should be used for ongoing and future work and for those cases where revised design loadings are greater than those indicated in existing pipe support calculations. The final assessment will be used as a basis to revise the Final Safety Analysis Report (FSAR). The SQN FSAR will be revised to include the basis for the U-bolt load ratings in the next annual update.

Unistrut Clamps

TVA has issued Design Standard DS-C1.6.14, "Design of Unistrut and B-Line Clamps for Piping and Tubing." This design standard provides allowable loads developed in accordance with requirements (load rating) of the ASME Boiler and Vessel Code Section III, Subsection NF, including the Winter 1974 Addenda. In addition, the design standard allowable loads include one-eighth-inch deflection limitation, lower bound test values (gapped or ungapped), and the use of a linear interaction equation.

TVA is in the process of evaluating the new load ratings (allowables) relative to previously completed, ongoing, and future work. Preliminary assessments indicate that the design standard need not be applied to previously completed work but should be used for ongoing and future work and for those cases where revised design loading are greater than those indicated in existing pipe support calculations. The final assessment will be used as a basis to revise the FSAR. The SQN FSAR will be revised to include the basis for unistrut load ratings in the next annual update.

Snubbers

Both hydraulic (Basic Engineers) and mechanical (Pacific Scientific) snubbers have been used at SQN.

The allowable load for hydraulic snubbers for the upset condition (operational basis earthquake) is based on information supplied by the vendor. The allowable load for hydraulic snubbers for the faulted condition (safe shutdown earthquake) is based on 1.2 x upset condition load rating. The 1.2 factor is a vendor-recommended value. The use of these factors ensures that the applied stresses during the faulted condition do not exceed 90 percent of yield. The hydraulic snubber vendor has concurred with this assessment. Thus, FSAR compliance is ensured for hydraulic snubbers.

Pre-NF and post-NF Pacific Scientific mechanical snubbers have been used at SQN.

Pre-NF mechanical snubbers were designed and fabricated using good commercial practice. Vendor allowables have been used for the upset condition. In addition, faulted allowables are based on 2 x upset condition allowables based on Pacific Scientific input. Structural testing and analysis of various pre-NF mechanical snubbers (locked) at load levels in excess of 110 percent of the faulted allowables by Pacific Scientific indicate no permanent deformation nor other indications of yielding. Thus, FSAR compliance is ensured for pre-NF mechanical snubbers.

Post-NF mechanical snubbers are designed and fabricated in accordance with the ASME Boiler and Pressure Vessel Code Section III, Subsection NF. Allowable loads are presented via vendor-certified load capacity data sheets for both upset and faulted conditions. Structural testing, snubber locked, with an applied load in excess of 110 percent of the faulted load resulted in no permanent deformation nor other indications of yielding. Thus, FSAR compliance is ensured for post-NF mechanical snubbers.

The preceding discussion indicates that both hydraulic and mechanical snubbers have been designed using appropriate allowables based on vendor input. The vendor allowables are consistent with the SQN FSAR 90 percent yield stress criteria and are consistent with allowables used for numerous other nuclear facilities.

Standard Support Components (Other than U-Bolts, Unistrut Clamps, and Snubbers)

This response relates to the use of faulted allowables equal to 2 x vendor-supplied normal allowables for standard support components.

This design methodology has been accepted as the basis for restart of both SQN units. This response provides TVA's assessment of the use of 2 x vendor allowables as faulted allowables in relation to the overall FSAR criteria that limit the maximum applied stress to 90 percent of the material yield stress.

A prepared and checked calculation (currently unissued) has been performed to determine if any standard support components fail to meet the maximum stress limit (90 percent yield) under faulted loads. This calculation determined that certain sizes of a limited number of standard support components may not comply with the FSAR maximum stress limit if loaded to 100 percent of their faulted capacity (2 x normal vendor allowables). These items have been identified on Condition Adverse to Quality Report (CAQR) SQP890351. An operability evaluation has been performed as an integral part of the CAQR. This operability evaluation confirmed that, while FSAR criteria are potentially exceeded, plant operability is ensured.

TVA is presently performing additional reviews to determine SQN-specific usage of the standard support components indicated in the CAQR. At present, it appears that at least one component has not been used in safety-related applications at SQN. Disposition of the CAQR will include development and implementation of action plans necessary to achieve FSAR compliance.

ENCLOSURE 2

Commitment

1. The SQN FSAR will be revised to include the bases for U-bolt load ratings and unistrut load ratings by April 15, 1990.