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SEP 14 1990

U.S. Nuclear Regulatory Commission
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Washington, D.C. 20555

Gentlemen:

In the Matter of the Application of	)	Docket Nos. 50-390
Tennessee Valley Authority	)	50-391

WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2 - VALIDATION PROGRAM USING WORST CASE, CRITICAL CASE, AND BOUNDING CALCULATION METHODOLOGY

This submittal is in response to a verbal commitment made by TVA during a presentation on August 2, 1990. Therein, TVA agreed to provide further information on the definitions and use of worst case, critical case, and bounding calculation methodologies for the WBN validation program.

During the original design effort, engineering calculations were developed to support the qualification of Watts Bar safety-related features. These calculations effectively served to establish the design basis for the Watts Bar seismic category features when evaluated against the plant design criteria requirements.

Since the original design of the plant, a number of technical issues have arisen which require additional validation of the documented structural qualification of the plant. These issues originated through the WBN quality assurance program, employee concerns, third-party reviews such as the vertical slice review, and industry-wide efforts to better understand the seismic performance of structures, systems, and components.

In response, TVA has implemented a broad civil engineering validation program which will effectively reconcile these identified concerns. In particular, the validation program incorporates measures to verify that civil/structural elements of the plant meet upgraded design criteria and licensing commitments.

Design Features with Retrievable Original Calculations

TVA is conducting evaluations to validate the adequacy of these design features by reviewing structural commodities against the imposed loadings. Commodities that are similar in configuration and application will be grouped together by common attribute. Qualification evaluations will then use worst cases, critical cases, and bounding calculations for the validation program.

Worst cases are where the actual installed configurations, systems, structures, or components are used to represent the most severe examples of a given family or population (as measured by stress, load, deflection, temperature, or other service response).

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Critical cases represent those cases, actual or hypothetical, that combine attributes which have the greatest cumulative effect on a structure or component's ability to meet design allowable stresses. They represent the most limiting configurations, in that they account for the attributes from the various actual installations in a given population.

Bounding calculations encompass the effects of varying parameters on a representative population. These calculations are preceded by the grouping of features and the identification of enveloping attributes. Bounding calculations may be performed to evaluate worst cases or critical cases. They estimate the maximum stresses anticipated for an actual or hypothetical condition. Validation by way of the bounding calculations to allowable stresses assures the adequacy of the underlying actual conditions.

Worst cases, critical cases, and bounding calculations will therefore serve to supplement the original qualification documentation for WBN features for specific issues. Existing design calculations provide the basis for the original qualification. Calculations developed as part of the validation program augment those calculations to resolve specific technical issues and concerns.

Design Features With Nonretrievable Original Calculations and Design Features with New Design Calculations

Nonretrievable original calculations, new design calculations, and calculations needed to support a modification to the plant will be generated on a case-by-case basis to meet the updated plant criteria requirements. For new designs, bounding calculations will be used to support standard design features (i.e., typicals).

No new commitments are identified in this submittal. All actions are encompassed by corrective action program plans for the various commodities.

This methodology was discussed with the staff as part of a TVA presentation August 2, 1990. Methodologies are available at the WBN site for NRC review. If any questions exist, please contact P. L. Pace at (615) 365-1824.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

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cc: See page 3

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