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TEXAS UTILITIES GENERATING COMPANY
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October 7, 1986

WILLIAM G. COUNSIL
EXECUTIVE VICE PRESIDENT

Director of Nuclear Reactor Regulation
Attn: Vince S. Noonan, Director
Comanche Peak Project
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NOS. 50-445 and 50-446
FSAR AMENDMENT SUPPLEMENTAL INFORMATION

Dear Mr. Noonan:

By letter TXX-5006 dated September 12, 1986, TUGCo transmitted to the NRC staff an advance copy of a future CPSES FSAR amendment which incorporates changes related to the Stone & Webster Engineering Corp (SWEC) piping and pipe support requalification effort. We believe these changes represent a significant improvement to our piping and pipe support analyses and are in conformance with currently accepted industry practice and NRC staff guidance.

In the attachment to this letter we provide additional information related to these changes. Each change has been identified and an explanation is provided regarding the bases for the change. The changes are primarily of three types: clarifications to the existing FSAR text, modifications of existing commitments, and new descriptions (e.g. description of computer codes used by SWEC). There are nine substantive modifications to previous commitments. Five of these modifications result in analyses which are more conservative than required by our previous commitments. These five modifications are set forth in the following FSAR pages:

3.7B-58a -- use of methodology described in NUREG/CR 1161 to account for modal contribution above cut-off,
3.7B-63 -- torsional effects of eccentric masses,
3.9B-23 -- functional capability,
3.9B-32 -- upgrade of fluid transient analysis methods in conformance with Appendix O of ASME Section III, and,
Table 3.9B-1B -- revised to reflect updated loading combinations.

The remaining four modifications are:

3.7B-4a -- use of Code Case N-411 damping values in lieu of R.G. 1.61 values,
3.7B-58b -- determination of the number of earthquake cycles,
3.9B-4 -- removal of SSE from emergency loading combination, and,

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3.9B-22 -- method of combining dynamic responses.

While these four changes cannot be considered to be more conservative than previous commitments, they all comply with current NRC staff guidance, including the Standard Review Plan (SRP), NUREG-0800. In addition, the modifications are consistent with SWEC practices and have been accepted by the NRC staff on other dockets.

Very truly yours,

W G Counsil

W. G. Counsil

By: G. S. Keeley

G.S.Keeley
Manager Nuclear Licensing

BSD/amb
Attachment

c - NRC (0 + 40 copies)
C. Trammell

FSAR Page
(as amended)

3.7B-4a Use of Code Case N-411 damping values in lieu of R.G. 1.61 values -- On a technical basis some damping values from Code Case N-411 are lower and some are higher than R.G. 1.61 values. The N-411 damping, which was developed by the Pressure Vessel Research Committee (PVRC), represents an upgrading of nuclear plant qualification technology. This Code Case has been approved for general usage by the NRC in R.G. 1.84 Revision 24 and has been used by more than twenty nuclear plants. A request to use Code Case N-411 was submitted to the NRC by TUGCo letter TXX-4160 dated November 18, 1985 with additional justification provided in TXX-4651 dated December 17, 1985. It was approved for use at CPSES in NRC letter from V.S.Noonan to W.G.Counsil dated March 18, 1986. The conditions of approval require FSAR documentation of all stress problems using this Code Case. These stress problems will be identified in the FSAR upon the completion of the SWEC requalification effort.

3.7B-58a Use of the methodology described in NUREG/CR 1161 to account for modal contribution above cut-off frequency -- The current FSAR states that the number of modes chosen is adequate provided that either, (1) inclusion of additional modes does not result in more than a 10 percent increase in responses, or (2) based upon evaluation of the dynamic participation factors, all significant modes have been included. The NUREG methodology assures participation of high frequency seismic responses in the zero period acceleration (ZPA) region of the spectra. Both methods are technically acceptable, however, the NUREG/CR 1161 methodology is an improvement because it is more direct and efficient. This is a more conservative methodology than is currently in the FSAR.

3.7B-58b Determination of the number of earthquake cycles -- This change revises the maximum amplitude loading cycles for OBE from 600 cycles to 50 cycles and for SSE from 120 cycles to 10 cycles. It also deletes the paragraph which describes how the number of maximum amplitude loading cycles is determined since this was based on Gibbs & Hill methodology and is not appropriate for the SWEC requalification effort. The number of cycles specified by this change is applicable only to Class 2 and 3 piping system components. The number of earthquake cycles is in conformance with regulatory guidance (NUREG-0800, Section 3.7.3, Subsection II.2.b and Section 3.9.2, Subsection II.2.b) and is consistent with SWEC methodology on other dockets.

3.7B-61 Anchor movements -- This is a clarification. The words "slow movement" were changed to "anchor movement". The word "slow" is not sufficiently descriptive. It is clarified to refer to either thermal or seismic displacement applied to the piping anchor at the terminal location.

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(as amended)

3.7B-62b Equation (8) -- Typographical correction.

3.7B-62c Equation (9) -- Typographical correction.

3.7B-62d Occasional loads included in emergency load combination -- This clarifies the definition of occasional loads (for the emergency loading combination using the Simplified Design Method as described in FSAR Section 3.7B.3.8.1.1) to consist of: jet impingement loads, dynamic emergency events and pipe impact loads.

3.7B-62e Removal of sentence describing the combination of vertical and horizontal loads -- This is a clarification in that the sentence was apparently inadvertently included previously in this location. Combining of vertical and horizontal loads is discussed in FSAR section 3.7B.2.1.2.

3.7B-62f Changed "directly" to "absolutely" -- This is a clarification in that the term "absolutely" is more commonly used to refer to the absolute summation method used in this analysis.

3.7B-63 Torsional effects of eccentric masses -- The proposed change differs in two ways from the previous wording. First, the phrase "all six degrees of freedom are taken into account" has been removed for clarity. When an eccentric mass is modeled in the piping analysis, whether or not it may be considered rigid, the mass is excited by the amplified response spectra which act in the three translational orthogonal directions. Rotational inputs are not provided and, thus, only three degrees of freedom are accounted for directly. However, since the eccentric mass is offset from the pipe centerline, the three rotational degrees of freedom are accounted for indirectly by a force acting at a moment arm from the pipe centerline. The intent reflected in the previous FSAR language is unchanged. Second, as part of the requalification effort, all eccentric masses are being considered in piping analyses. In addition to eccentric valves, this approach includes other support mass either resting on the pipe or attached integrally to it. Inclusion of this support mass in the piping analysis responds to external concerns and is more conservative than what had previously been done.

3.7B-71 Additional reference (NUREG/CR-1161) included -- See discussion under item 3.7B-58a.

3.7B(A)-1 References new Appendix 3B for additional computer codes -- Information only. The contents of this appendix are discussed under Appendix 3B.

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(as amended)

3.9B-4	Removal of SSE from emergency loading combination -- This change is being applied to ASME Class 2 and 3 piping systems and components, and to Class 1, 2 and 3 pipe supports. This change is also applicable to all piping and supports analyzed by SWEC for the IE Bulletin 79-14 program. Application of this revision is in compliance with NUREG-0800, Appendix A, and is consistent with the methodology used in CPSES NSSS (Class 1) loading combinations, and with SWEC methodology used on more than eight dockets.
3.9B-5	References new Appendix 3B for additional computer codes -- Information only. The contents of the Appendix are discussed under Appendix 3B.
3.9B-11 & 3.9B-12	Removal of FSAR restriction that prevents use of plastic analysis for code components -- This is not a commitment to <u>use</u> plastic analysis. Any specific usage will be in accordance with the ASME Code and will be submitted to the NRC staff for approval as required.
3.9B-20 3.9B-21	ASME Code Class 2 and 3 Components and Component Supports -- The proposed change specifies the Code of record for Class 2 and 3 piping systems and supports. It expressly invokes NA-1140 for use of later Code Editions and Addenda and also references the plant specifications for the location of details relating to Editions, Addenda and Cases used for Class 2 and 3 piping systems and supports. These words were added for information to describe existing practice.
3.9B-22	Method of combining dynamic responses -- Substitutes SRSS method for absolute summation method for combining peak dynamic responses of piping systems due to seismic, LOCA, and/or occasional loads. This change applies to ASME Class 2 and 3 piping and Class 1, 2 and 3 pipe supports. The SRSS combination of SSE and LOCA responses is in accordance with the methodology of NUREG-0484 "Methodology for Combining Dynamic Responses", (May 1980). The SRSS method for combining water hammer events (occasional loads) with earthquakes and plant dynamic events is also an acceptable method in NUREG-1061, "Evaluation of Other Dynamic Loads and Load Combinations", (Volume 4, January 1985). Application of this change is consistent with SWEC methodology used on more than eight dockets and consistent with the methodology used on CPSES NSSS (Class 1) piping. In addition this change improves the overall plant design by eliminating unnecessary pipe supports which will minimize plant maintenance and reduce personnel exposures consistent with ALARA considerations.

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(as amended)

3.9B-23 Functional capability -- Additional requirements imposed for analysis of certain essential systems which result in additional conservatism. These requirements are in accordance with NUREG-0800, Section 3.9.3, Appendix A and assure the operability of essential piping systems during and after a plant accident condition.

3.9B-31 Pressure relief devices -- editorial change to the title of this section.

3.9B-32 Upgrade of fluid transient analysis methods for pressure relieving devices in conformance with Appendix O of ASME Section III -- R.G. 1.67 (the previous CPSES commitment) was superseded by Appendix O of the ASME Code Section III, by NRC letter from Robert Minogue dated April 15, 1983. For open systems, the primary differences are that Appendix O mandates that equation (9) of NC (or ND) 3652 of the ASME Code, Section III be satisfied and specifies additional requirements for safety valve arrangement and dimensions.

3.9B-33 Closed system -- The proposed revision for closed discharge systems clarifies this Section by providing more detail of the design considerations of a closed system. Two specific changes are of note. First, the previous method for computing the transient hydraulic forces has been revised to more accurately consider the dynamic effects of transient fluid flow. Specifically, forces attributed to these effects, previously accounted for by the factor K′, are now computed directly in the SWEC methodology. Second, the statement that a support will be provided for each straight leg of discharge piping has been eliminated. The need for supports, including those for discharge piping, is determined by analysis. When analysis determines that such a support is required, it is provided. Unnecessary supports have been shown to be detrimental to piping system performance.

3.9B-34 thru-37 Component Supports --
This clarifies the existing section. The clarification includes: renumbering items in 3.9B.3.4.1; reformatting Section 3.9B.3.4 for consistency and ease of locating areas of interest; correcting a referenced Code paragraph from NF-3320 to NF-3230 ; further specifying a referenced Code paragraph from NF-3231 to NF-3231.1b; replacing existing paragraph under linear supports, faulted condition, to more clearly define allowable stresses.

3.9B-40 Additional references included -- Information only.

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Table 3.9B-1A	Removal of SSE from emergency load combination -- See item 3.9B-4 discussion
Table 3.9B-1B	Revised to reflect updated loading combinations -- The Normal condition has been expanded to include Testing; specifically, preoperational Containment Structural Integrity Pressure Test and subsequent Containment Integrated Leak Rate Test. In addition, thermal anchor movements experienced during Normal conditions are now explicitly included. These changes are clarifications to define more precisely the Normal/Test condition. The Upset condition has been revised to explicitly include thermal anchor movements. "Single non-repeated anchor movements due to building settlement" has been deleted since this is not a parameter that is considered significant for piping analyses. The changes to the Upset condition are clarifications to better define the SWEC load combination criteria. The Emergency condition has been revised to delete SSE (see item 3.9B-4). The Faulted condition has been expanded to include temperature, thermal anchor movements, containment displacements and SSE anchor movements. These expanded loading combinations apply only to piping systems whose normal function is to prevent or mitigate the consequences of events associated with a plant faulted condition (note 8). Note 8 is a clarification of the previous note 8 to better explain to which systems the lower allowables apply. Notes 10, 11 and 12 were also added for clarity. With the exception of deleting SSE from the emergency loading combination, the changes to this table result in more conservative loading combinations.
Table 3.9B-1C	Revised to reflect updated loading combinations -- Adds thermal and containment pressurization loads to the Testing condition; Deletes SSE from the Emergency condition (see item 3.9B-4); defines SSE in the Faulted condition; adds containment anchor movement to the Faulted condition; deletes note 1 for clarification and renumbers the remaining notes. The additions make this table consistent with Table 3.9B-1B.
Table 3.9B-1D, and 3.9B-1E	Removes reference to Experimental Stress Analysis from types of analysis performed.--Experimental Stress Analysis is an optional analysis allowed by the Code but was never used at CPSES. It was removed from these tables for clarity.
Appendix 3B	New appendix describing all computer codes along with their verifications used by SWEC for requalification of Class 2 and 3 piping and Class 1, 2 and 3 pipe supports. All codes listed in this appendix have been used on other dockets by SWEC. All but three codes have been referenced in plant FSARs. The three unreferenced codes are merely utility codes (data processing and/or computational) which are not required to be listed in the FSAR but are listed for completeness.