UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of TEXAS UTILITIES GENERATING COMPANY, et al. (Comanche Peak Steam Electric Station Station, Units 1 and 2)	Docket Nos. 50-445-1 and 50-446-1

CASE'S ANSWER TO APPLICANTS' STATEMENT OF MATERIAL FACTS AS TO WHICH THERE IS NO GENUINE ISSUE REGARDING APPLICANTS' CONSIDERATION OF DAMPING FACTORS FOR OBE AND SSE LOADING CONDITIONS

in the form of

AFFIDAVIT OF CASE WITNESS MARK WALSH

1. Applicants state:

"Piping systems are not 'active systems,' as that term is used in Regulatory Guide 1.61 (Iotti Affidavit at 3)."

I dispute this point. Since these piping systems are supporting active valves and components, the systems must be evaluated as though they were active systems using the appropriate damping factor to determine the load induced to the active valve or component.

The basis for my position is contained in Regulatory Guide 1.48, "Design Limits and Loading Combinations for Seismic Category 1 Fluid System Components," which states in pertinent part (page 1.48-5):

> "4. Active ASME Code Class 1 pumps and valves that are designed by analysis:
>
> "a. The design limits specified in NB-3222 of the ASME Code should not be exceeded when the component is subjected to either (1) concurrent loadings associated with either the normal plant

condition or the upset plant condition and the vibratory motion of 50 percent of the SSE, or (2) loadings associated with the emergency plant condition, or (3) concurrent loadings associated with the normal plant condition, the vibratory motion of the SSE, and the dynamic system loadings associated with the faulted plant condition." (Emphasis added; footnotes omitted.)

For this reason, I disagree with the Applicants' response under cover letter dated 6/28/84 to CASE's discovery question, which stated (bottom of page 2):

"(1) Mr. Walsh questioned why it is appropriate to use damping factors from Regulatory Guide 1.61 for piping, when active valves and pumps which are on the piping are qualified for OBE damping factors only. In response to this inquiry we provide the following response:

> "It is incorrect to assume that, because active valves or pumps may be located at a random point in the piping run, Regulatory Guide 1.61 (Table 1, Note 2) is intended to penalize the entire piping system by the use of lower damping factors simply because of the existence of the active component. The higher damping factors permitted for piping analysis for the SSE may be used to establish end loads for the active components. However, valves and pumps are normally specified and procurred prior to piping analysis and are qualified for more stringent spectra than the piping. Thus, spectra are furnished for those active components directly, which will reflect the lower damping factor of the OBE."

Applicants' statement that ". . . valves and pumps . . . are qualified for more stringent spectra than the piping" is also in error, as confirmed in the attached May 25, 1982 letter to R. E. Ballard of Gibbs & Hill from J. R. Johnson, Project Mechanical Engineering, TUSI, and received by CASE from Cygna on discovery in regards to seismic analysis of valves. As indicated in that letter, there are valves that cannot be considered rigid. In regard to test results on certain ITT-Grinnell valves, the letter stated (page 1, first paragraph):

"The valves were to have been designed for 33hz. and the test indicated that the air operated valves could only reach 20 hz. and the motor operated valves 27 hz."

To correct this problem and associated problems, three options were considered as shown below (last two paragraphs, page 1):

"Based on the resonant search test results, Kamel suggested that we look at three options. Option number 1 was to have ITT-Grinnell put gusset plates on the valves to increase the frequency to 33 hz. Option number 2 was for the site to add external bracing by means of valve supports and clamps. Option number 3 was for the stress analyst to review the valves with their given frequency and determine if the stress analysis would still be acceptable. It was mutually agreed upon the Option number 3 would be tried first.

"TS/SSAG has reviewed the stress analysis reports for 1-HV-5157 and 5158 and have found them to be acceptable as is. The 1-CT-135 and 136 valves by comparison should be all right, however; we have not actually verified them at this time. The valves and piping are currently being rerouted and once the new routing is complete, SSAG will verify their acceptability."

It further appears that as of May 3, 1983, option number 3 had actually been incorporated into the design specification (see attached May 3, 1983, letter from Robert E. Ballard, Project Manager, Gibbs & Hill, to J. B. George, Vice President/Project Gen. Mgr., TUGCO, and attached Design/Engineering Change/Deviation Request No. S-2716).

From the above-referenced document, it would appear that those valves were specified to be rigid (frequency greater than 33hz.) but were procured using a <u>less</u> stringent (rather than more stringent) criteria.

2. Applicants state:

"Applicants use 1 and 2 percent critical damping response spectra for the OBE and SSE evaluations, respectively, for small diameter (12" and under) piping systems. These are the damping factors set forth in Regulatory Guide 1.61. (Iotti Affidavit at 3.)"

I question this statement. In the 7/16/84 Cygna Report ("Final Report, Independent Assessment Program of Comanche Peak Steam Electric Station (Phase 3)," prepared by Cygna Energy Services). Observation No. PI-00-03, sheet 1 of 1, states:

> "The seismic analyses of the Main Steam piping outside Containment used response spectra curves at 2% and 3% damping for 1/2 SSE and SSE, respectively. The modal analyses for these systems show that the primary response is located in the 8" relief lines. This size piping requires the use of curves at 1% and 2% damping." (Emphasis added.)

It is also noted that Cygna considered this to be "Extensive" and not an isolated matter.

It would appear to me that Applicants are attempting to mislead the Licensing Board. (See also comments in answer 1 above.)

3. Applicants state:

"The piping seismic analysis for support CS-1-235-067-C41K used damping values of 1 and 2 percent critical damping. (Iotti Affidavit at 3-4)."

In Dr. Iotti's Affidavit (page 4), Applicants claim that CASE was apparently misled by a statement in the NRC Staff's SIT Report (NRC Staff Exhibit 207) and that the SIT was not clear regarding the use of 2 and 4 percent damping factors. If an error was made in the SIT Report, it appears to me that the proper way for it to have been

handled was for Applicants to so advise and, if the Staff agreed, for the Staff to officially notify the Board and parties that a change should be made in the SIT Report. To my knowledge, this has not been done. Because of this, at this point in time, we don't know whether what the SIT saw was the use of damping values of 1 and 2 percent or 2 and 4 percent.

It appears to me that the possibility exists that Applicants are using the coupling factor as a cover-up for the use of the wrong damping factors. This possibility is more plausible because of Cygna's finding (see item 2 above). Since Dr. Iotti was not actively involved (as far as I am aware) with these issues at the time of the SIT Report, he would not know of his own personal knowledge what values were used at that time.

4. Applicants state:

"Piping stress analysis problem 1-41, which includes support CS-1-235-067-C41K, used 2 and 4 percent critical damping for calculating the coupling factor. This assumption is conservative. (Iotti Affidavit at 4-5.)"

There is not sufficient documentation attached to Applicants' Motion for Summary Disposition to support the conclusion that Applicants' assumption is conservative. Applicants' FSAR (Applicants' Exhibit 3), Section 3.7N.2.7, discusses the piping stress analysis. I have not reviewed the entire stress analysis problem, and am unable at this time to either confirm or deny that the assumption is

conservative. However, it should be noted that the coupling factor is only used when frequencies between adjacent modes are within 10% of one another. If there are no modes with frequencies within 10% of one another, the coupling factor is not used and is immaterial.

In addition, the equations where the coupling factor is utilized will require the use of the correct or appropriate damping value for the coupling factor to be conservative. That is to say, in the equation in Applicants' FSAR section 3.7N.2.7, equation 3.7N-29, the damping value for the response of mode 1 and mode 2 must be the lower damping value and it would be conservative to use a higher damping value when calculating the coupling factor. I question whether or not this was actually done because usually most of the analyses are done on a computer where a damping value is input into the analysis, and the same damping value is used throughout the analysis and not changed for one particular calculation.

5. Applicants state:

"Applicants use different seismic spectra for OBE and SSE events, as appropriate for the two types of events. Use of these spectra is not related to the selection of damping factors. (Iotti Affidavit at 5.)"

I do not disagree with these statements, except as to whether or not the spectra used are actually appropriate, as discussed elsewhere in this answer.

6. Applicants state:

"Damping factors other than those specified in Regulatory Guide 1.61 were used for the Westinghouse reactor loop configuration. Use of these different factors was justified by analyses, as an exception to Regulatory Guide 1.61. Iotti Affidavit at 5-6.)"

Since I have not reviewed the analyses used to justify use of the different damping factors for the Westinghouse reactor loop configuration, I can neither confirm or deny whether or not their use was, in fact, justified, as Applicants claim.

It should be noted, however, that according to Applicants' FSAR (Applicants' Exhibit 3), at 1AN-34, indicates that the only system which used higher damping values than listed in Regulatory Guide 1.61 is the reactor coolant loop. Therefore, the applicable damping factors listed in Regulatory Guide 1.61 are to be used for all piping systems except the reactor coolant loop. This is important insofar as the rest of this answer is concerned.

Attachments:

5/25/82 letter to R. E. Ballard, Gibbs & Hill, from J. R. Johnson, Project Mechanical Engineering, TUSI, regarding test results on certain ITT Grinnell valves (see answer 1, page 2)

5/3/83 letter to J. B. George, Vice President/Project General Manager, TUGCO, from Robert E. Ballard, Project Manager, Gibbs & Hill, regarding Design/Engineering Change/Deviation Request No. S-2716 (see answer 1, page 3)

The preceding CASE's Answer to Applicants' Statement of Material Facts As To Which There Is No Genuine Issue was prepared under the personal direction of the undersigned, CASE Witness Mark Walsh. I can be contacted through CASE President, Mrs. Juanita Ellis, 1426 S. Polk, Dallas, Texas 75224, 214/946-9446.

My qualifications and background are already a part of the record in these proceedings. (See CASE Exhibit 841, Revision to Resume of Mark Walsh, accepted into evidence at Tr. 7278; see also Board's 12/28/83 Memorandum and Order (Quality Assurance for Design), pages 14-16.)

I have read the statements therein, and they are true and correct to the best of my knowledge and belief. I do not consider that Applicants have, in their Motion for Summary Disposition, adequately responded to the issues raised by CASE Witness Jack Doyle and me; however, I have attempted to comply with the Licensing Board's directive to answer only the specific statements made by Applicants.

Mark Walsh

(Signed) Mark Walsh

STATE OF TEXAS

On this, the 4th day of August, 1984, personally appeared Mark Walsh, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes therein expressed.

Subscribed and sworn before me on the 4th day of August, 1984.

Laura G. Garcia

Notary Public in and for the
State of Texas

My Commission Expires: 12/2/84

Incoming CPPA, SM Marano/MS-20B, J Iron., K Schlaak, MS-604,

TEXAS UTILITIES SERVICES INC. J Calamito, A Adorno
P. O. BOX 1002 · GLEN ROSE, TEXAS 76043

K. Bandyopadhyay

CPPA #19,525

May 25, 1982

Action: KSch, AA, KKB

KKB - Please supply necessary information to prepare DECD's

024B/M1355
024B/I0334

Mr. R. E. Ballard
Gibbs & Hill, Inc.
393 Seventh Avenue
New York, N. Y. 10001

COMANCHE PEAK STEAM ELECTRIC STATION
ITT-G RESONANT SEARCH TEST PROCEDURE
NUMBER NSC/RS-001
CP-020B and CP-604

Dear Mr. Ballard:

On May 10, 1982, Mr. Seb Marano and Mr. Kamal Bandyopadhyay of G & H and Mr. Harlan R. Deem of TUSI held a telephone conference to discuss the test results on the subject ITT-Grinnell valves. The resonant search test performed by ITT-G. failed for both the air operated and motor operated valves. The valves were to have been designed for 33hz. and the test indicated that the air operated valves could only reach 20 hz. and the motor operated valves 27 hz.

The following is a list of valves which ITT-Grinnell has yet to qualify:

1-HV-5157	Air Operated	20 hz.
1-HV-5158	Air Operated	20 hz.
2-HV-5157	Air Operated	20 hz.
2-HV-5158	Air Operated	20 hz.
1-CT-135	Motor Operated	27 hz.
1-CT-136	Motor Operated	27 hz.
2-CT-135	Motor Operated	27 hz.
2-CT-136	Motor Operated	27 hz.

Based on the resonant search test results, Kamel suggested that we look at three options. Option number 1 was to have ITT-Grinnell put gusset plates on the valves to increase the frequency to 33 hz. Option number 2 was for the site to add external bracing by means of valve supports and clamps. Option number 3 was for the stress analyst to review the valves with their given frequency and determine if the stress analysis would still be acceptable. It was mutually agreed upon that Option number 3 would be tried first.

TS/SSAG has reviewed the stress analysis reports for 1-HV-5157 and 5158 and have found them to be acceptable as is. The 1-CT-135 and 136 valves by comparison should be all right, however; we have not actually verified them at this time. The valves and piping are currently being rerouted and once the new routing is complete, SSAG will verify their acceptability.

TUSI recommends that G & H proceed with obtaining necessary information from ITT-G in order to obtain final approval. TUSI will provide to G & H the loads which are applied to valves by stress analysis. The loads for 1-HV-5157 and 5158 are between 2G and 3G. We do not have the loads for 1-CT-135 and 136 valves at this time.

G & H will review the loads from SSAG for ITT-G valves and verify that the valve design parameters are still valid. G & H will then prepare a DECD to ammend specifications MS-020B and MS-604.

TUSI will issue DCA to specification MS-020B and MS-604 when we have reviewed and accepted G & H's DECD.

It is imperative that the remaining work to qualify these valves be accomplished in a timely manner. The valves are waiting on shipment to the site and need the DCA to the specification before they can be released.

Very truly yours,

J. R. Johnson
Project Mechanical Engineering

JRJ:HAH:HRD:ery

cc: ARMS
M. R. McBay
J. T. Merritt
W. O. Hendley
G. Krishnan
D. Hicks

REBallard/MS-20B, OUTGOING, MSMiller, AKiwi/860.2716,
XOMoore, KKBandyopadhyay, KSchlask, EJBond

A UTILITIES COMPANY

May 3, 1983

GTN- 65374

Texas Utilities Generating Company
Post Office Box 1002
Glen Rose, Texas 76043

Attention: Mr. J. B. George
Vice President/Project Gen. Mgr.

Gentlemen:

TEXAS UTILITIES GENERATING COMPANY
COMANCHE PEAK STEAM ELECTRIC STATION
G&H PROJECT NO. 2323
09410 DEVIATION REQUESTS
DE/CD S-2716, Rev.1
SPECIFICATION 2323-MS-20B

Enclosed for your review is a copy of Design Engineering Change Deviation Request number S-2716, R.1. Please inform us of your disposition of this request.

All recipients of this letter are advised that authorization from TUSI is required before proceeding with the action noted herein.

Very truly yours,

GIBBS & HILL, Inc.

Robert L. Ballard, Jr.
Project Manager

REBa- KKM:lc
1 Letter + 1 Attachment
CC: ARMS (B&R Site) OL + OA

Bravo

DESIGN/ENGINEERING

CHANGE/DEVIATION REQUEST

[X] NUCLEAR SAFETY-RELATED [ ] NON-NUCLEAR SAFETY RELATED - QA PROGRAM APPLICABLE [ ] NON-NUCLEAR SAFETY RELATI

G&H Job. No. 11-2323-056 DE/CD Request No. S-2716 Rev. 1

Requested By: G&H[ ] Client[X] Field[ ] Vendor[ ] CPPA-19525 (JRJohnson) FROM

Reference Document AM Memo AM M-4379 Rev. - Date 2/17/83

Documents Affected: G&H Specification 2323-MS-20B, Rev. 1 & Addendum 1

DESCRIPTION OF CHANGE/DEVIATION REQUESTED:

See attached

ENGINEERING JUSTIFICATION FOR ABOVE:

The motor-operated valves have a resonance frequency below 33 Hertz.

REQUEST PREPARED BY: K.K.Bandyopadhyay Title Sr.Eng'r Date 4/27/83

INTERDISCIPLINE REVIEWS

	Initials	Date
Structural		
Mechanical	KSch	4/27/83
Electrical	phac	4/26/83
QA		
AM	[illegible]	4-27-83
RWHS	[illegible]	4-27-83

Design Reviewer/Engineer Completes This Section

1. Is this a significant deviation or error? YES [ ] NO [ ]
2. Is this a recurring deviation or error? YES [ ] NO [ ]

Design Reviewer Completes This Section

Design Verification: Approved [✓] Not Approved [ ]

Design Review Eng. R. Mamalyan Date 4/27/83

Job Engineer Completes this Section

1. Is change potentially reportable under 10CFR21? YES [ ] NO [x]
2. Is change in compliance with BTP-ETSB 11-1? YES [X] NO [ ] NA [ ]
3. Applicable DCRP _____ Date _____

CHANGE/DEVIATION REQUEST:

Approved [✓] Not Approved [ ] Approved [✓] Not Approved [ ]

J. E. [signature] Date 4/27/83 Project Manager [signature] Date _____

DESIGN/ENGINEERING CHANGE/DEVIATION REQUEST S-2716

Description of Change/Deviation Requested

Revise G&H Specification 2323-MS-20B, Rev. 1 and Add. 1, as follows:

Revision 1 - Page 3-31, Paragraph 3.7.9.3.c (Addendum 1, page 5 of 7, Item 13, Renumbered Paragraph 3.7.9.4.b) - Rewrite the entire paragraph as follows:

If the valve assembly has a fundamental natural frequency of 33 Hertz or greater, the manual, motor-operated and self-actuated Saunders patent type steel valves shall be designed to withstand seismic forces resulting from accelerations of 3g in each of the two horizontal directions and 2g in the vertical direction caused by the Safe Shutdown Earthquake (SSE). The corresponding Operating Basis Earthquake (OBE) g-values shall be 2.25g and 1.5g. If the fundamental natural frequency of the valve assembly is less than 33 Hertz, the Seller shall provide all natural frequencies below 33 Hertz and applicable mass and stiffness data. This data will be incorporated in the supporting pipe system analysis, and the above mentioned g-values will be verified (by others). If the resulting acceleration levels exceed the g-values mentioned above, the Seller will be so notified, and the Seller shall qualify the equipment for the new g-values; otherwise, above listed g-values shall be used for qualification of the equipment. In all cases, the two (2) horizontal and vertical seismic accelerations shall be assumed to act simultaneously, with the resulting stresses, deflections, etc., obtained by the (SRSS) square root of the sum of the squares technique. The equipment function shall not be impaired by the SSE.

Revision 1 - Page 3-31, Paragraph 3.7.9.3.f (Addendum 1, page 6 of 7, Item 14, Renumbered Paragraph 3.7.9.4.e) -

Delete the entire paragraph.