

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

DOCKETED  
USNRC

'84 AGO 15 P12:11

CASE'S ANSWER TO APPLICANTS' STATEMENT OF MATERIAL FACTS  
AS TO WHICH THERE IS NO GENUINE ISSUE REGARDING  
CASE ALLEGATIONS REGARDING SECTION PROPERTY VALUES

in the form of

AFFIDAVIT OF CASE WITNESS MARK WALSH

1. Applicants state:

"The NRC Staff testified that the 7th Edition's section property values are more conservative than the 8th Edition, and therefore the use of these values do not represent a safety concern (Tr. 6867-70)."

Although it is true that the Staff stated this, obviously the Staff's statements are not binding on CASE or me.

Further, the Staff neglected to consider the effects of the flare bevel weld in the SIT Report (NRC Staff Exhibit 207), which is unconservative when using the 7th Edition properties, and the 8th Edition properties are used in the field. The effective throat for a flare bevel weld is equal to  $5/16$  of the radius of the tube steel member, as per the 8th Edition of the AISC Manual.

For a member from the 8th Edition, the corner radius is equal to 2 times the thickness. For a member that has a thickness of  $1/2$ ", for example, the effective throat is equal to  $1/2" \times 2 \times 5/16 = 5/16"$ , and

this is what is actually constructed in the field, according to the Applicants.

For a member using the 7th Edition properties, with a corner radius equal to 3 times the thickness, the calculated effective throat is as follows:  $1/2" \times 3 \times 5/16 = 15/32"$ . Obviously, the calculated effective throat using the 7th Edition properties and using the 8th Edition criteria is 1.5 times as much as what is actually installed in the field.

Therefore, to this extent, the use of the 7th Edition properties (to which the tube steel members do not conform) is not as conservative as using the 8th Edition and is not a consistent design practice, as will be shown below in Answer 2. This is an item the Applicants neglected to consider.

2. Applicants state:

"Prior to January, 1982 (sic) /1/, ITT, NPSI and PSE all used tube steel properties from the AISC Manual of Steel Construction, 7th Edition.

"The AISC included one set of value to cover both hot rolled and cold formed steel. Affidavit at 2.

/1/ During the 6/6/84 telephone conference call between Applicants/ Staff/CASE (Tr. 58-59 and 62-63), Applicants stated that this sentence should be changed to show that prior to January 1981 ITT Grinnell, NPSI and PSE all used the tube steel properties from ISC Manual of Steel Construction, 7th Edition. (They stated that the same error appeared in the Motion itself.)

Applicants further stated that it appears that the same error appeared in the SIT Report (NRC Staff Exhibit 207) on page 62; in any event, Applicants' statement now is that there never was an overlap and that it was always either the 7th Edition up to January 1981 and then from January 1981 to January 1982, it was just the Institute values. (Tr. 65-66.)

"However, the values listed conformed mostly to the hot rolled steel.  
Id.

"In January 1981, PSE elected to use properties from the 1972 Welded Structural Tube Institute Manual of Cold Formed Welded Structural Steel Tubing. Id.

"PSE used these values from January 1981 to January 1982. /2/ Id.

"During this time, the Welded Structural Tube Institute ("WSTI") revised and reissued its manual, lowering the member properties to agree precisely with the values listed in the 8th Edition of the AISC Manual of Steel Construction. Id.

"(The 8th Edition of the AISC Manual had increased the member properties from the 7th Edition.

"PSE adopted these values in January 1982. Id. at 2-3."

I agree that the AISC included one set of values to cover both hot rolled and cold formed steel; the properties are based on a corner radius and a corner radius has a stipulation to be a certain value to come up with the member properties, no matter whether it is cold formed or hot rolled. Therefore, in this instance, it doesn't matter whether or not the tube steel was cold form or hot rolled; the corner radius would have to be the specified amount.

I agree that the values listed conformed mostly to the hot rolled steel, but they also conform to the cold formed steel, because they are both made from the same criteria.

In regard to Applicants' statement that "In January 1981, PSE elected to use properties from the 1974 Welded Structural Tube Insitute

/2/ During the 6/6/84 telephone conference call between Applicants/Staff/CASE (Tr. 59-60), Applicants clarified that in the fourth and fifth sentences, they were actually referring to PSDG (pipe support design group), which was actually the forerunner organization to PSE at CPSES.

Manual of Cold Formed Welded Structural Steel Tubing," CASE requested the design guidelines showing that the PSE group used the 1974 Welded Structural Tube Institute Manual of Cold Formed Welded Structural Steel Tubing properties and when the values were listed in the guidelines. (See Transcript of 6/6/84 Telephone Conference Call, pages 60-61.) It is now our understanding, from Mr. Horin's verbal communication to Mrs. Ellis, that there is no further documentation other than that contained in Applicants' Affidavit attached to their Motion for Summary Disposition. Therefore, the Applicants were without any documented guidelines to follow, including which code was to be utilized, until late 1981.

In addition, CASE requested documentation showing why the PSDG group elected to use the values from Welded Structural Tube Institute (WSTI). Applicants stated:

"CPSES included one set of values to cover both hot rolled and cold form and conservatively listed values which conform mostly to the hot rolled steel. CPSES never used any hot rolled steel structural steel tubing . . . we went to that to use values more directly related to cold form steel . . . since had no hot rolled tube steel." (See discussion, 6/6/84 conference call, Tr. 61-63.)

This is important since the values from the WSTI can vary by more than 20% when compared to the 7th Edition properties. The major concern is the PSE group decided to use the member properties from the WSTI when those shapes were not utilized at CPSES. ANSI N45.2.11 (Applicants' Exhibit 148, as supplemented) requires the design be consistent with what is actually built. More precisely, the design input requirements under section 3.2(8) ANSI N45.2.11 state that

material requirements must be included where applicable; this would include section properties. It would appear that the Applicants have neglected to consider the fact that what is assumed in a calculation is not necessarily what actually exists in the field. In reviewing the material test report from one of the suppliers for the tube steel (which we received on discovery, I believe regarding the SIT report, but are unable to locate at the moment), it is not specified which properties the tube steel conforms to (that is, WTSI, 7th Edition, or 8th Edition).

In addition, the Applicants' statement that PSE adopted these values in January 1982 is because of Jack Doyle and me. The history of this is as follows: When Jack became a member of the STRUDL group and I was the group leader, Jack informed me that the values used by the "hog house" (a field engineering group) were not consistent with the standard mill practice, and he showed me what the standard mill practice was. This standard mill practice corresponded to the 7th Edition section properties. At that time, the FSE group (another field engineering group) was using the 8th Edition properties, the PSDG group was using the WSTI properties, and ITT Grinnell and NPSI were using the 7th Edition properties. When a STRUDL computer run was required to be run on the computer, we first had to know which group requested the computer run so we could use their selected section property values. When Jack showed me the standard mill practice which corresponded to the 7th Edition, it was evident that the WSTI section property values



were not valid. Prior to going to Gary Krishnan with this information, I first went to one of the group leaders in the "hog house." I asked him why the WSTI values were being used and he told me that one of the engineers working within the group had shown a group supervisor the values that are in page 2 of CASE Exhibit 763I (Attachment to Jack Doyle Testimony, CASE Exhibit 763, admitted at Tr. 6877/7042). He said that they (apparently referring to the group supervisor and other management officials) stated that these values are higher than those listed in the 7th Edition and should be used.

After discussions with Gary Krishnan about this problem, he informed me that John Finneran had told him (Gary Krishnan) and Gary Krishnan told me that we were to use the 8th Edition properties for the now-PSE group (formerly PSDG and FSE groups) on future STRUDL runs, and John Finneran would find out what section properties were being provided to the site. We were never given this information. It would appear that the Applicants did not go and verify whether or not the material (that is, the tube steel properties) conformed to the WSTI, the AISC 7th Edition, or the AISC 8th Edition. I believe that this is clearly contrary to ANSI N45.2.11 (Applicants' Exhibit 148), Section 3.2.(8) as already stated; in addition, it appears to me that the way I was informed to use the 8th Edition properties was contrary to Section 5.2.4 of ANSI N45.2.11, which states:

"5.2.4     Documentation

"Procedures shall be established to control the flow of design information between organizational units. Design information transmitted from one organizational unit to

another shall be documented and controlled. Transmittals shall identify the status of the design information or document provided and, where necessary, identify incomplete items which require further evaluation, review or approval so that appropriate controls may be initiated. Where it is necessary to initially transmit design information orally or by other informal means, the transmittal shall be confirmed promptly by a controlled document." (Emphasis added.)

3. Applicants state:

"All tube steel at CPSES is 500 /3/ Grade B, which conforms to the AISC 8th Edition values. Id. at 3."

I question this statement. If what the Applicants state is true (that is, all tube steel conforms to the 8th Edition), why were the Applicants using the WSTI values? Also, how do the Applicants know that the section properties were not from the 7th Edition, since the steel could have been formed to the 7th Edition and sold at a later date to CPSES and the Applicants are assuming that all steel conforms to the 8th Edition. A review of the mill test report for the steel only lists the strength values for the test specimen and its chemical composition and does not consider the section properties of the steel (or it would have been on the mill test report).

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/3/ During the 6/6/84 telephone conference call between Applicants/Staff/CASE, Applicants clarified that "500" should actually be "A500." (Tr. 66.)

Applicants further stated that the 7th Edition values applied to both cold formed and hot rolled steel, so that would apply also to A500, and that the AISC 7th Edition used one value to represent both steels and that the 7th Edition used one value to represent both steels and was shaded toward hot rolled steel. They stated that in 1982, upon learning the Cold Form Institute and AISC had changed their values, Applicants adopted those revised values, also. (Tr. 66-67.)

4. Applicants state:

"The most important property value is the moment of inertia."

I disagree with this statement. In the first place, in their Statement of Material Facts, Applicants have misquoted their own Affidavit from which the Statement of Material Facts was supposedly taken. In that affidavit, Messrs. Finneran and Iotti do not claim unequivocally that "The most important property value is the moment of inertia." They state (Affidavit page 3):

"Probably the most significant property value is the moment of inertia (I)." (Emphasis added.)

I also disagree with Applicants' statement for the following reasons. The most significant property value is dependent on how the member is being used. For example, a bending member may require a high section modulus and that could be the most significant member property, to keep stresses below allowables. An axially loaded member may need a high cross-sectional area or a high radius of gyration to keep its stresses below allowables, and this would be the most significant member property. As another example, a weld may need a large corner radius to provide a large enough effective throat for the flare bevel weld, and this could be the most significant member property. Thus, Messrs. Finneran and Iotti could not (and did not) claim that the moment of inertia is the most significant property value. Applicants are obviously just making this bogus statement to support their conclusion in item 5.



5. Applicants state:

"An analysis of the difference between the WSTI (1974) values for the moment of inertia and those of the 8th Edition of AISC important for the tube steel of concern reflects a range from 4.4% to 11.4%, with the average being 6.3%. Id. at 3."

It should also be noted that on page 3 of their Affidavit,

Messrs. Finneran and Iotti state:

". . . the difference . . . range (sic) from 4.4% to 11.4% with the average being 6.3%. (Hardly the misleading 20 and 25% values that Mr. Walsh has been using.)"

Applicants' statements are very misleading. Although what they've said is true as far as the members shown in Table A of their affidavit, insofar as a comparison between the WSTI (1974) values and those of the 8th Edition of AISC, the difference between the WSTI version and the 7th Edition of AISC (which Messrs. Finneran and Iotti did not discuss) would indicate an average change of 10% in the moment of inertia of those members listed in Table A of their Affidavit, with the 4x4x1/2" tube steel member having a difference in moment of inertia of 20%. See discussion under answer 2. preceding.

6. Applicants state:

"Applicants have committed to conduct a complete reanalysis of all small bore Class I and large bore support designs to the 8th Edition AISC values. Applicants Exhibit 142 at 29."

Applicants' statement is misleading. In normal usage in these proceedings, CASE (and I) have assumed that when Applicants use the term "Applicants" in their pleadings, they are referring to Applicants and their agents. In this instance, we would have assumed (and would expect that the Board also would have assumed) that "Applicants" meant PSE, ITT Grinnell, and NPSI.

However, NPSI and ITT Grinnell use cross-sectional properties for tube steel from the AISC Manual, 7th Edition (while PSE uses the 8th Edition). In the 7/16/84 Cygna Report /4/ (Appendix J, front of section, General Notes to Pipe Support Checklists, page 5 of 9, item 9. Cross-Sectional Properties for Tubesteel), Cygna noted these usages by the three organizations and stated that they had asked Applicants about this and were referred to the Affidavit of J. C. Finneran and R. C. Iotti Regarding CASE's Allegation Involving Section Property Values, which was filed on 5/18/84. Cygna further stated:

"As further noted in the TUGCO response to Cygna (TUGCO letter 6/8/84), TUGCO will issue a DCA to specification 2323-MS-46A to note this exception to the AISC 7th Edition." (Emphasis added.)

The implication in Applicants' statement 6. is that all of Applicants' agents who are involved with pipe support designs at CPSES have committed to conduct a complete reanalysis to the 8th Edition AISC values. However, there is nothing which actually supports the idea that NPSI and ITT Grinnell have any such intention. It appears to me that Applicants are deliberately attempting to mislead the Licensing Board, or Cygna, or both.

Further, it appears to me to be a potentially significant item reportable under 10 CFR 50.55(e) because they did not know what the significance is. In addition, the material traceability is indeterminate, since they don't know for sure whether it's from 8th Edition, 7th Edition, or WSTI.

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/4/ "Final Report, Independent Assessment Program of Comanche Peak Steam Electric Station (Phase 3), Prepared by Cygna Energy Services"

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 12 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 12 day of August, 1984.

*Samuel W. McElroy*

Notary Public in and for the

SAMUEL W. McElroy of Texas

My Commission Expires

1-31-85

My Commission Expires: \_\_\_\_\_

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Docket Nos. 50-445-1  
and 50-446-1

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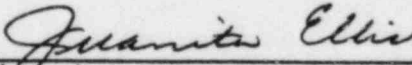
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