UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

APPLICANTS' STATEMENT OF MATERIAL FACTS
AS TO WHICH THERE IS NO GENUINE ISSUE

1. Both the AWS and ASME Codes include requirements for welding procedures that will result in welds that are adequate for their intended uses. Affidavit of W.E. Baker, M.D. Muscente, J.D. Stevenson, and R.E. Lorentz, Jr. Regarding Allegations Involving AWS and ASME Code Provisions at p. 4.

2. The ASME Code requires that all welding procedures used for the fabrication and installation of components and their supports be qualified by test pursuant to the requirements of Section IX of the ASME Code. In order to satisfy these ASME requirements, each manufacturer or installer performing Code welding must conduct tests necessary to qualify each welding procedure. Id.

3. The AWS Code provides for the use of either prequalified welding procedures (i.e., not requiring qualification testing prior to their use) or welding procedures which are qualified by test. Id. at p. 4.

4. Although its provisions for prequalification are generally applicable to any steel structure, the drafters of the AWS Code have acknowledged the limitations of that Code in stating that "when using the Code for other structures, owners, architects and engineers should recognize that not all of its provisions may be applicable or suitable to their particular structure." (AWS D1.2, Commentary on Structural Welding Code, Section 1.1.) (It should be noted that the AWS Code is not applicable to pressure retaining boundaries such as pressure vessels or piping systems (AWS D1.1, Section 1.1.1).) Id. at p. 5.

5. In qualifying welding procedures in accordance with the requirements of Section IX of the ASME Code (as well as Section 5 of the AWS D1.1 Code), a draft welding procedure is first written describing the precise status of certain variables specified in Section IX of the ASME Code (essentially the same specified in the procedure qualification section of the AWS Code). A test plate or pipe is prepared and welded in strict accordance with the draft welding procedures. Mechanical tests are then performed in accordance with the requirements of Section IX of the ASME Code to determine if the welding process and parameters are acceptable and adequate to produce welds that will withstand design and operating loads. Id. at p. 6.

6. The tests are performed using specimens removed from the test plate or pipe. Each test has a separate purpose in determining whether the weld produced using the welding procedure

is structurally sound and capable of withstanding design and operating loads. The tests required by the ASME Code, Section IX (which are essentially the same as endorsed by AWS) are as follows:

1. Tension tests, used to determine ultimate tensile strength, yield strength and ductility (reported as % elongation and/or % reduction of area);

2. Guided bend tests, used to determine the degree of soundness and ductility of groove weld joints;

3. Charpy V-Notch Impact or Drop Weight tests, used to determine the notch-toughness of the weldment (these tests are only performed when fracture toughness is specified in NF-2311, or for integral attachments, when required by other sections of the ASME Code); and

4. Fillet-weld tests, used to determine the size, contour, and degree of soundness of fillet welds (This test is used to qualify welding procedures when only fillet welds are to be produced using that procedure). Id. at pp. 6-7.

7. If acceptable results are obtained from the testing, the procedure has been qualified and a Procedure Qualification Record (PQR) is prepared listing the specified parameters used for the welding. Id. at p. 7.

8. All welding procedures qualified by test pursuant to the ASME Code for use at CPSES follow the requirements of Section IX of the ASME Code. This includes following requirements regarding test procedures, testing of specimens, and all other aspects which could affect the procedure qualification process. Id. at p. 8.

9. If a welding procedure is qualified by test in accordance with each provision of Section IX of the ASME Code, use of that procedure will produce welds that are structurally sound and as adequate for their intended use as welds produced using either prequalified procedures of the AWS Code or procedures qualified by test in accordance with the AWS Code. Id. at p. 8.

10. With respect to "preheat requirements for welds over 3/4-inch thick," the AWS D1.1 Code addresses preheat requirements for prequalified procedures in Subsection 4.2, "Preheat and Interpass Temperature Requirements." (If procedures are to be qualified by test pursuant to the AWS Code, the preheat requirements specified in subsection 4.2 need not be used.) For these prequalified procedures, Table 4.2 establishes preheat requirements based on the type of material and the welding process used. While Appendix D of the ASME Code, Section III, provides guidance for preheat requirements (very similar to that provided in the corresponding sections of AWS), the Code states that during welding procedure qualification, the preheat requirements which have been actually tested and produce acceptable welds are the ones to be specified in the applicable procedures. Id. at pp. 10-11.

11. Qualification of procedures in accordance with the ASME Code has resulted in preheat requirements in the applicable CPSES welding procedures that in all cases either meet or exceed those preheat requirements set forth in the AWS Code. Id. at p. 12.

12. With regard to "Drag Angle and Work Angle" (which limit the space allowed for the welder to function), neither the AWS nor ASME Codes refer to, or in any way mention "drag angle" or "work angle" requirements or restrictions. Id. at p. 12.

13. CASE's stated concern regarding improper work angle and drag angle is that it may cause slag entrapment, porosity and undercut. These defects are no different than potential concerns regarding any other weld. Id. at p. 13

14. With regard to "Beta Factor for Tube-to-Tube Welds," the Beta Factor (the ratio of the diameters of two adjoining tubes) is referenced in Section 10 of AWS D1.1 Code, subsection 10.12.5, 10.13.5 and Figure 10.13.5. In essence, these references provide that if the Beta Factor is greater than 1/3 for tube-to-tube (circular) connections and greater than 0.8 for box (rectangular) connections, the weld procedure used must be qualified by test (the greater the Beta factor, the more likely that stresses at the joint will be higher). In short, where the likelihood of greater stresses is present, the Beta Factor is used in the AWS Code to indicate that qualification of a procedure by test is required. Significantly, the ASME Code requires that all weld procedures be qualified, without consideration of the likelihood of greater stresses. Id. at p. 14.

15. In Mr. Doyle's testimony (CASE Exhibit 669, Vol. I, p. 112), he states as his concern that the Beta factor limit of 1/3 should apply to shielded metal arc fillet welds used when welding

trunions to pressure boundary piping. Since such a trunion would be an "integral attachment" to the piping, the AWS Code does not apply and the weld must be designed to the applicable pressure boundary subsection in ASME, i.e., NB, NC, or ND. AWS D1.1 (as stated in paragraph 1.1.1) clearly does not apply to this case (i.e., pressure boundary piping). Id. at pp. 14-15.

16. With regard to "Lap joint requirements," Subsection 8.8 of the AWS D1.1 Code provides lap joint requirements for building structures. These requirements are the same as those set forth in Paragraphs XVII-2431, 2452.3(c), 2453.1, 2452.9 and 2283.1(c) of Appendix XVII of the ASME Code (mandatory to CPSES welding in conformance to ASME requirements). (Subsection 9.10 of the AWS D1.1 Code provides corresponding lap joint requirements for bridges, subjected to continuous dynamic loading.) Id. at p. 15.

17. With regard to "Limitation on weld size relative to plate thickness," limitations are addressed by AWS D1.1 Code in Subsections 2.7 (fillet welds) and 2.10 (partial penetration groove welds). These subsections basically provide that with regard to fillet and groove welds, welds to be made without qualifying the applicable procedure by test shall conform to the minimum size requirements of Tables 2.7 and 2.10.3, respectively. These requirements are identical to or less stringent than those required at CPSES by the ASME Code in Appendix XVII, Table XVII-2452.1-1. Id. at p. 16.

18. Neither the AWS nor ASME Codes establish specific requirements limiting weave or oscillating pattern welding. Accordingly, there are no specific Code requirements. Id. at p. 17.

19. Neither the ASME nor AWS Codes exclude use of downhill or uphill welding. However, the ASME Code and the AWS Code specify that the direction of travel must be listed. At CPSES, Brown & Root welding procedures state that in all instances the direction of progression will be upward. Other contractors, in a few instances, use downward progression as specified in their welding procedures. Id. at p. 18.

20. Cap welding is not terminology common to welding. Code requirements for other welding apply equally to cap welding. Indeed, the AWS Code at Section D1.1, subsections 3.7.1, (1975 Revision) specifically endorses it. Id. at p. 19.

21. Neither Code provides any unique restrictions in placing new weld material on an old weld, or even requires its consideration as an essential or non-essential variable. Id.

22. CASE's apparent concern regarding this issue is that some fillet welds in the plant were found to be approximately 1/16 inch below the minimum size specified in the ASME Code. These welds were subsequently corrected. It should be noted that in no instance did any welder or QC inspector report a crack in any of the welds. Id. at p. 20.

23. The apparent welds of concern to CASE were designed to resist extensive and substantial seismic loading well in excess of any external loading that likely did occur from the time that the welds were made until they were built up. In this regard, it should be noted that even with undersized welds, the AWS Code states that the weld is still acceptable even if undersized 1/16 of an inch for 10 percent of the weld length (AWS Code, Sections 8.15.1.6 and 9.25.1.6). The ASME Code added this provision to Subsection NF in the winter 1983 addenda. Id. at pp. 20-21.

24. The primary reason for internal cracking is not an undersized pass, but rather a weld pass that is too thick. Id. at p. 21.

25. To prevent underbead cracking, only low hydrogen type electrodes are utilized and the bulk of the pipe support fabrication employs low carbon steels not susceptible to underbead cracking problems. For those special items utilizing steels which may be subject to underbead cracking, welding procedures are utilized which contain the necessary preheat or post weld heat treatment requirements to eliminate the metallurgical conditions which are necessary for underbead cracking to occur. Id. at p. 22.

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CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing "Applicants' Motion for Summary Disposition of Certain CASE Allegations Regarding AWS and ASME Code Provisions Related to Welding Issues; Request for Expedited Response" in the above-captioned matter was served upon the following persons by overnight delivery (*), or deposit in the United States mail, first class, postage prepaid, this 5th day of April, 1984, or by hand delivery (**) on the 6th day of April, 1984.

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