UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

APPLICANTS' STATEMENT OF MATERIAL FACTS
AS TO WHICH THERE IS NO GENUINE ISSUE
REGARDING THE EFFECTS OF GAPS ON STRUCTURAL
BEHAVIOR UNDER SEISMIC LOADING CONDITIONS

1. All bolts in multiple bolt, bearing-type connections will react imposed shear loads within at most the distance of the bolt hole tolerances. (Iotti, Finneran Affidavit at 8.)
2. Applicants' specifications for bolt hole tolerances are 1/16" for up to 1" diameter bolts and 1/8" for 1" and greater diameter bolts. (Iotti, Finneran Affidavit at 7.)
3. Test data indicate that bolts of the kind Applicants use have margins of safety for shear displacements equal to the maximum bolt hole tolerances ranging from 5.6 (1 1/4" super kwick Hilti) to 3.2 (1 1/4" Richmond Inserts). (Iotti, Finneran Affidavit at 8-9.)
4. Consideration of all bolts in multiple bolt, bearing connections, with bolt hole tolerances equivalent to those used by Applicants, to react shear loads equally is accepted industry practice and is premised on the fact that the

inelastic localized deformations that could result from self-limiting stresses do not unacceptably reduce the ultimate bolt capacity. (Iotti, Finneran Affidavit at 5-7.)

5. The report CASE relied on (CASE Exhibit 1001) to support its contention that at most two bolts may be considered to react shear loads in multiple bolt, bearing connections addressed connections in which bolt hole tolerances from 1.33 times bolt diameter, up to 1/2" for 1" bolts, may be present. These conditions could result in a safety factor for shear displacement of only 1.1. (Iotti, Finneran Affidavit at 9-10).

6. In a seismic event, only the first quarter cycle loading could cause preferentially loaded bolts to deflect in shear. For the remainder of the cycles the bolts will equally react the loading (Iotti, Finneran Affidavit at 13.)

7. The effect of gaps in seismic analyses cannot be defined in absolute terms. The effect is dependent on many factors, including the nature of the excitation (magnitude and distribution of frequencies), and the size, orientation and number of gaps. (Iotti, Finneran Affidavit at 13-14.)

8. Impact damping also occurs in seismic events where gaps are present. To account for this damping, however, would require consideration of effects that require complex analyses which depart from accepted design practices. (Iotti, Finneran Affidavit at 14.)

9. Material damping will take place as the gap is transversed without a corresponding feed of energy from the seismic event. This is a beneficial effect for the seismic response of the system. (Iotti, Finneran Affidavit at 14-15.)

10. Each of the factors discussed in Findings 7-9 cannot be accounted for in the typical linear response spectrum analyses, as are used at Comanche Peak. (Iotti, Finneran Affidavit at 15.)

11. Each of the factors discussed in Findings 7-9 can only be accounted for with difficulty by performing nonlinear time history analyses. (Iotti, Finneran Affidavit at 15.)

12. Identifying the effects of gaps by comparison of the results of nonlinear time history (with gaps) and response spectrum (without gaps) analyses is difficult and one may not discern whether particular results are attributable to differences in individual variables or assumptions or the analytical techniques themselves. (Iotti, Finneran Affidavit at 15-16.)

13. Comparison of the results obtained by response spectra analyses and nonlinear time history analyses which simulate actual gaps in systems show that

    a) the seismic response spectrum method, which ignores the nonlinearities, is more conservative than the non-linear time domain method (which includes gaps), and

b) the effect of gaps on reduction of response frequency is negligible due to the transient nature of the seismic acceleration loading.

(Iotti, Finneran Affidavit at 16-17.)