

RELATED CORRESPONDENCE

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

DOCKETED
USNRC

'84 MAY 24 09:12

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

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

APPLICANTS' MOTION FOR SUMMARY
DISPOSITION OF CASE'S ALLEGATIONS
REGARDING U-BOLTS ACTING AS
TWO-WAY RESTRAINTS

Pursuant to 10 C.F.R. § 2.749, Texas Utilities Electric Company, et al. ("Applicants") hereby move the Atomic Safety and Licensing Board ("Board") for summary disposition of the Citizens Association for Sound Energy's ("CASE") allegations regarding U-bolts used as one-way restraints acting as two-way restraints. As demonstrated in the accompanying affidavit of R.C. Iotti and J.C. Finneran, Jr. Regarding U-Bolts Used as One-Way Restraints Acting as Two-way Restraints ("Affidavit") (Attachment 1) and Statement of Material Facts (Attachment 2), there is no genuine issue of fact to be heard regarding this issue. Applicants urge the Board to so find, to conclude that Applicants are entitled to a favorable decision as a matter of law, and to dismiss this issue from this proceeding.

I. BACKGROUND

In August, 1982, intervenor CASE deposed Mr. Jack Doyle, a former employee of Applicants, with respect to certain allegations Mr. Doyle had regarding the design of pipe supports at Comanche Peak. Mr. Doyle's deposition was subsequently admitted into the record in this proceeding as his testimony (CASE Exhibit 669; Tr. 3631). One issue raised by Mr. Doyle concerned the impacts of U-bolts which had been considered as one-way restraints, acting on the piping systems as two-way restraints. (CASE Exhibit 669 at p. 87-8). All parties presented testimony on this issue, e.g., CASE Exhibit 669B Item 3, Applicants Exhibit 142 at answer 16 and NRC Staff Exhibit 207 at 29-31.

Following litigation of the pipe support design allegations, each of the parties submitted proposed findings addressing, inter alia, allegations regarding U-bolts acting as two-way restraints. (See Applicants' Proposed Findings of Fact Concerning Pipe Support Design Questions (August 5, 1983) at 47-50; NRC Staff Proposed Findings of Fact (August 30, 1983) at 51-53; CASE Proposed Findings of Fact and Conclusions of Law (August 22, 1983), Section II; and Applicants' Reply to CASE's Proposed Findings of Fact and Conclusions of Law (September 6, 1983) at 9-12). In its Memorandum and Order of December 28, 1983, concerning design issues, these allegations were not addressed.

This motion addresses CASE's concerns regarding "U-bolts used as one-way supports acting as two-way restraints" set forth in Section II of its Proposed Findings and provides the information which Applicants committed to generate as part of Applicants' Plan to Respond to Memorandum and Order (Quality Assurance for Design) ("Applicants' Plan") at 7, item 14 (February 3, 1984).

II. APPLICANTS' MOTION FOR SUMMARY DISPOSITION

A. General

Applicants have previously discussed the legal requirements applicable to motions for summary disposition in their "Motion for Summary Disposition of Certain CASE Allegations Regarding AWS and ASME Code Provisions Related to Welding," filed April 15, 1984 (at 5-8), incorporated herein by reference.

B. CASE's Allegations Regarding U-bolts Acting as Two-Way Restraints Should Be Summarily Dismissed

In Section II of its Proposed Findings, CASE alleges that (1) failure to consider both lateral and vertical restraining action of U-bolts (two-way restraint) invalidates the results of piping stress analyses performed with the U-bolts being modeled only for vertical restraint (one-way restraint), and (2) U-bolts used at CPSES for one-way restraint on rigid frames will not meet the manufacturer's recommended interaction limits and will fail when the actual lateral loads from thermal and seismic movement are present. In responding to CASE's second allegation,

Applicants will also provide the information committed to as part of the Plan, i.e., provide evidence by test of the capability of U-bolts to accept simultaneous normal and lateral loadings. Applicants' Plan at 7, Item 14.

In responding to CASE's concerns, Applicants have conducted an evaluation of the affected U-bolts and associated piping. The results of this evaluation are set forth in the attached Affidavit. As set forth more fully below, neither of CASE's two allegations raises an issue that reflects a breakdown in Applicants' Quality Assurance ("QA") Program or a safety concern in the plant. Accordingly, no genuine issue of material fact exists with respect to these allegations, and the Board should find that the Applicants are entitled to judgment as a matter of law.

1. General

A 1/16 inch gap was designed into each U-bolt restraint on a rigid frame. Affidavit at 3. As a first support design effort, it was viewed that this gap would accommodate the thermal and seismic movement of piping. Id. (The movement due to a seismic event was preliminarily calculated to be very small, i.e., less than 1/32 inch for almost all piping.) Id. Accordingly, in the initial pipe support design (prior to as-built conditions), all such U-bolts had been considered as only one-way restraints (because the lateral gap was present).

As the as-built design review and corresponding pipe support reanalyses were being conducted, Applicants determined that the thermal movement of piping associated with some U-bolt supports would exceed the 1/16 inch gap provided, and some seismic movement may exceed 1/32 inch. Id. (It should be emphasized that this review program was a part of the normal review cycle and was ongoing prior to these allegations being raised in this proceeding.) Id.

As part of the as-built review program, Gibbs & Hill reran the thermal piping analyses at all locations where U-bolts were initially considered as one way restraints and where the piping thermal movement was equal to or exceeded 1/16 inch. Those reanalyses indicated that even assuming the U-bolt acted as a two-way restraint, the piping stresses would remain well within allowable values. Id. at 4. Despite Gibbs & Hill's reevaluation, which established that the system as built would have been acceptable, Applicants decided to replace all U-bolts on rigid frames initially considered as one-way restraints where piping thermal movements were computed to be equal to or exceed 1/16 inch in the original analysis. Id.

Applicants decided not to rerun the piping analyses for seismic movement, as piping movements associated with seismic excitation were believed to be very small and generally less than 1/32 inch. Id. Applicants had concluded that even if seismic movements at the location of affected U-bolts would exceed 1/32

inch, any additional seismic movement would be small enough such that the U-bolts would have sufficient capacity to accommodate resulting lateral loads. Id. (This position was supported by a 1975 test on U-bolts conducted by Carleton Materials Laboratory, Attachment 2). Id. at 5. In addition, Applicants determined that any additional restraining action caused by such limited seismic movement would not have any significant adverse impact on the piping analysis, and, in virtually all cases, would be beneficial from a piping analysis standpoint, i.e., would lead to lower pipe stresses and nearby support loads. Id. The accuracy of such judgment was verified by analysis. Id.

Subsequently, CASE made allegations regarding U-bolts acting as two-way restraints and the capability of such U-bolts to support lateral loads. Id. at 6. In sum, prior to CASE raising the issue of U-bolts acting as two-way restraints, Applicants had identified the issue and were in the process of resolving it. Id. at 3-4.

2. The Impact on Piping Analyses of Modeling U-bolts as Two-Way Restraints Is Small and Acceptable

To respond to CASE's concern regarding U-bolts acting as two-way restraints, Applicants compiled a list of all of the Unit 1 and common U-bolts on rigid frames, modeled as one-way restraints (a total of 70). Id. at 6. While the maximum thermal pipe movement associated with each of the seventy U-bolts would not exceed the 1/16 inch design gap, the maximum thermal plus

seismic movement of eight would. Id. To assess the impact on piping analyses of a U-bolt installed in the plant acting as a two-way restraint, Applicants conservatively reanalyzed stress problems associated with the two worst case U-bolts (i.e., those U-bolts with the maximum combined thermal and seismic movement, CCX-013-012-A43R and CC-1-007-040-A63R), and a representative sample of other U-bolts initially considered as one-way restraints. Id. at 6-10.

The reanalyses reflected that any effects of the U-bolts acting as two-way restraints on piping stresses and associated loads (e.g., nozzle and anchor loads) would be small or negligible and would not result in exceeding allowable stresses or manufacturers' allowable values. Id. at 7-8. Further, the analyses reflected that the effects on other associated piping supports are generally decreases in the loads; where there are increases, they are well within allowables. Id. at 8-10.

In sum, the analyses noted above provides reasonable assurance that CASE's allegation is not indicative of a breakdown in the design QA program and does not present a safety concern. Accordingly, CASE's allegation is without merit and does not raise a genuine issue of material fact subject to resolution in this proceeding.

3. U-Bolts Considered as One-Way Restraints Can Withstand Lateral Loads Resulting from Maximum Thermal and Seismic Movement without Exceeding the Manufacturer's Interaction Limits or Other Allowables

If maximum thermal and seismic movement were assumed to occur simultaneously, there would be a lateral load (in addition to the load in the normal direction) acting on eight of the 70 U-bolts of concern. Id. at 10. While CASE acknowledges that this lateral load will be small when compared to the load in the normal direction (CASE Findings at II-3), CASE is concerned that if the lateral and normal loads are combined, the allowable interaction equation limits specified by the manufacturer will be exceeded, and failure will occur. Id.

Applicants' response to CASE's concern consists of (1) the results of testing of these U-bolts and (2) a reverification that the manufacturer's interaction equation limits are not exceeded. Id. With regard to testing, Applicants commissioned ITT Grinnell to carry out a series of tests on U-bolt capability to carry both normal and lateral loads. (It is emphasized that the capability of U-bolts to accept large lateral loads was known to the Applicants prior to this test; NPSI had run tests on the lateral load capability of U-bolts in 1975.) Id. at 10-11. The new tests reflected that even for lateral displacements exceeding the maximum that could occur, the lateral load would not impair the capability of the U-bolt to carry its load in the normal direction. Id. For example, the tests reflect that even if the

maximum seismic plus thermal lateral displacement were to induce a lateral load equal to fifty percent of the rated normal load. the U-bolt would still have more than a factor of 2.5 margin of safety in its normal direction. Id. at 11. Since even CASE admits that the lateral load will be much smaller than the rated load, there is ample margin of safety. Id.

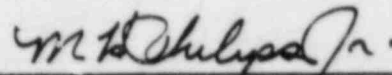
With respect to whether the U-bolts exceed the limits specified in the manufacturer's interaction formula, using conservative assumptions, it was determined that all of the U-bolts at issue here were well within the manufacturer's limits. Id. at 12-15.

In sum, testing has established that the U-bolts can withstand significant lateral loads, much greater than CASE has postulated and much greater than calculated to occur even assuming that the maximum thermal and seismic movement occurred simultaneously. Id. at 15. Moreover, even using very conservative assumptions, the U-bolts were well within the limits specified by the manufacturer's interaction ratios. Id. at 15-16. These computations, along with the testing, provide reasonable assurance that the U-bolts will not exceed allowables or fail as a consequence of combined normal and lateral loads. Accordingly, CASE's allegation is without merit and does not raise a genuine issue of material fact.

IV. CONCLUSION

For the reasons set forth above, Applicants request that the Board grant Applicants' motion for summary disposition.

Respectfully submitted,



Nicholas S. Reynolds
William A. Horin
Malcolm H. Philips, Jr.

BISHOP, LIBERMAN, COOK,
PURCELL & REYNOLDS
1200 Seventeenth Street, N.W.
Washington, D.C. 20036
(202)857-9817

Counsel for Applicants

May 23, 1984