TEXAS UTILITIES GENERATING COMPANY
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R. J. GARY
EXECUTIVE VICE PRESIDENT
AND GENERAL MANAGER

June 3, 1981
TXX-3138

Mr. G. L. Madsen, Chief
Reactor Projects Branch
U. S. Nuclear Regulatory Commission
Office of Inspection & Enforcement
611 Ryan Plaza Dr., Suite 1000
Arlington, Texas 76012

Docket Nos. 50-445
50-446

COMANCHE PEAK STEAM ELECTRIC STATION
PIPING MINIMUM WALL
FILE NO: 10110

Dear Mr. Madsen:

In accordance with the requirements of 10 CFR 50.55(e), we are submitting the attached final report relative to a violation of piping minimum wall thicknesses initially reported to your office on May 22, 1979.

Periodic reports have been submitted throughout the course of our investigation. The attached report includes and summarizes information previously submitted and defines the corrective actions that were developed as part of our overall evaluation.

If we can provide any additional information, please advise.

Very truly yours,

R. J. Gary

R. J. Gary

RJG:kh
Attachment

cc: NRC Region IV - (0 + 1 copy)

Director, Inspection & Enforcement - (15 copies)
c/o Distribution Services Branch, DDC, ADM.
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

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ATTACHMENT

VIOLATION OF PIPING MINIMUM WALL THICKNESS

Description of Deficiency

On April 24, 1978, a design change was issued defining permissible variations from the specified minimum wall thickness requirements for ASME Section III, Code Class piping fabricated on site. Subsequently, similar design changes were made to the shop fabrication and piping erection specifications. The criteria established for the above design changes were based on minimum wall calculations considering temperature and pressure only and were used for evaluating piping which was found to be below the minimum wall thickness requirements of the material specification.

In the process of performing stress analysis on piping systems, Engineering identified that the variations in wall thickness could result in overstress conditions in the piping. Actual wall thicknesses had not been fully documented (due to the deviations permitted by the above mentioned design changes), and thus the impact of the condition could not be specifically addressed.

It should be noted that the piping suppliers furnished piping in bulk form that satisfied the requirements of the CPSES procurement specifications. Counterboring operations, backgrinding of welds, and certain base metal defects, such as arc strikes, pits, nicks, etc., ultimately led to wall thickness problems.

Safety Implications

Approximaely 400 repairs have been made or will be made to locations randomly distributed throughout both the safety and non-safety related piping systems. Because of the random distribution, it is postulated that pipe rupture might have caused the failure of a safety related system at some point in time that could have degraded the plant into an unsafe condition.

Corrective Actions

Corrective actions have included the following:

1) The aforementioned design change documents were rescinded, thus reestablishing the original wall thickness requirements. This was accomplished by May 30, 1979. On September 6, 1979, a design change document was issued which reiterated wall thickness requirements and provided weld build-up criteria in accordance with the ASME Code and applicable Engineering specifications.

2) A review of piping that may have been accepted under the erroneous design change documents was accomplished by the Comanche Peak Construction and Engineering groups. This review ultimately included:

   a) A listing of off-site fabricated piping falling below minimum required values;

   b) A review of records associated with welds and base metal repairs completed on site during the time frame that the erroneous design change document was in effect. Such records included: Nonconformance Reports (NCR), Resolution of Defect Forms (RDF), and Manufacturing Record Sheets (MRS). Where actual wall thickness measurements were not available or judged not to be definitive, ultrasonic measurements were made using the combined services of Southwest Research Institute and the Comanche Peak Quality Control group.

3) The results of the review of MRS's, and other welding records, and ultrasonic reports were summarized on Thickness Measurement Sheets for subsequent review by Engineering. These detailed reviews resulted in the following categories of conditions:

   a) Piping wall thicknesses at or above required minimum values (which do not require remedial action);

   b) Piping wall thicknesses up to and including 0.010 inches below required minimum values; and

   c) Piping wall thicknesses in excess of 0.010 inches below required minimum values.

   A consolidated listing of all piping thicknesses determined to fall below required minimum values was developed and is included as part of Nonconformance Report M-857, thus assuring positive identification and closure for each item.

4) The Architect/Engineer (in a parallel effort) performed a series of conservative calculations which resulted in the development of stress multiplier factors for a range of pipe sizes, wall thicknesses and piping configurations (straight runs, branches, supports, anchors, etc.). These calculations and other factors resulted in the following criteria for dispositioning this matter:

   a) All piping with wall thicknesses in excess of 0.010 inches below the required minimum values have been or will be repaired using the established weld build-up criteria.

b) All Class 1 piping with less than required minimum wall thicknesses have been or will be repaired using the established weld build-up criteria.

c) Weld repairs have also been specified for some piping where deviations do not occur at weld joints or where otherwise required by the engineering specifications or calculations.

d) Based on the conservative analyses performed, all other piping with wall thicknesses up to and including ^ 010 inches below required minimum values have been deemed acceptable as installed. The stress multipliers for this condition were developed assuming deviations 0.020 inches below required minimum values and are being factored where appropriate into the ongoing design activities. Deviations accepted as installed will be further verified during final stress analyses (both computer and non-computer analyzed systems). In the event that the final analyses show the as-built deviations to be unacceptable, appropriate repairs or support modifications will be accomplished.

Implementation Schedule

Necessary revisions to fabrication and installation documents were accomplished as stated above. The review efforts and dispositions per the above criteria are complete except for one weld. Required weld repairs are targeted for completion consistent with the project turnover schedule and will be completed prior to hydro. Final stress analyses will begin as soon as practical and are targeted for completion prior to Hot Functional Testing.