APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGION IV

Report: 50-445/81-14; 50-446/81-14

Dockets: 50-445; 50-446 Category A2

Licensee: Texas Utilities Generating Company
2001 Bryan Tower
Dallas, Texas 75201

Facility: Comanche Peak, Units 1 and 2

Inspection at: Comanche Peak Steam Electric Station

Inspection Conducted: August and September 1981

Inspector: for L. E. Martin 10/27/81
R. G. Taylor, Resident Reactor Inspector Date
Reactor Projects Section 3

Approved: W. A. Crossman 10/27/81
W. A. Crossman, Chief Date
Reactor Projects Section 3

Inspection Summary:

Inspection conducted during August and September 1981 (50-445/81-14; 50-446/81-14)

Areas Inspected: Routine, announced inspection by the Resident Reactor Inspector (RRI) including general site tours; follow-up on previously identified inspection findings; follow-up on licensee identified construction deficiencies; protection of installed equipement; and installation of safety-related piping systems. The inspection involved 114 inspector-hours by the RRI.

Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

Principal Licensee Employees

*D. N. Chapman, TUGCO, Quality Assurance Manager
*R. G. Tolson, TUGCO, Site Quality Assurance Supervisor
*J. R. Merritt, TUSI, Engineering and Construction Manager
*B. C. Scott, TUGCO, Quality Engineering Supervisor

Other Persons

*J. V. Hawkins, Brown & Root, Project Quality Assurance Manager

The RRI also interviewed other licensee and Brown & Root employees during the inspection period.

*Denotes those persons who attended one or more management meetings with the RRI.

2. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item and 10 CFR 21 Report (50-445/79-01; 50-446/79-01): Qualification of Borg-Warner Valves.

On January 24, 1979, the licensee's architect/engineer (A/E), Gibbs & Hill, notified the NRC via a 10 CFR 21 report that 44 power operated valves being supplied by Borg-Warner Nuclear Valve Division had been found not completely seismically qualified by the vendor for use at the Comanche Peak Station. In the same period, the RRI found during the inspection of the vendor documentation for one of the 44 valves already installed that there was no supporting documentation of the qualification of the motor operator installed on the valve as required by the FSAR. During this inspection period, the RRI was provided with correspondence stating that Gibbs & Hill had reviewed and approved Borg-Warner calculations supporting the seismic withstand capability of each of the type of valves involved in the 44 original units. RRI reviewed one calculation document for a valve type and determined that it followed the pattern dictated by the governing code, ASME Section III. The RRI also reviewed a Gibbs & Hill internal memorandum stating that the Part 21 item had been closed to Gibbs & Hill's satisfaction. (Note: Part 21 does not require the party reporting a "defect" to subsequently notify the NRC that all necessary actions have been completed.) The RRI was also provided with report B-0058 prepared by the Limitorque Corporation which provided test data supporting the enviromental qualification of their motor operators typical of the one observed by the RRI in January 1979. The report substantiates that the operators are qualified to the requirements of IEEE 382 as required by commitments contained in the FSAR. The

RRI also reviewed Gibbs & Hill correspondence to the licensee indicating that they had reviewed and approved the report. Based on the available documentation, the RRI concluded that both Gibbs & Hill Part 21 report and the unresolved item had been resolved and had no further questions on this matter.

(Closed) Infraction (50-445/80-23): Lack of Full Penetration of Welds on CB&I Manufactured Pipe Whip Restraints

The RRI was provided with engineering and quality control documentation related to lack of full penetration welds on certain Chicago Bridge & Iron Co. (CB&I) fabricated pipe whip restraints. The engineering documentation consisted of two Design Change Authorizations. The Design Change Authorizations (8875 and 9072 with attached documentation) indicated that a total of four of the restraints required modification by the addition of welded members to achieve the required design strengths. The balance of the restraints, seven in all, that also contained partial penetration welds where full penetration had been specified by the engineer's design drawing, were stipulated to be usable "as-is" based on engineering calculations. Based on the original design calculations, the new calculations indicated that the partial penetration welds would provide adequate strength to meet the design intent. The RRI reviewed the calculations relative to the applicable design code (American Welding Society D1.1) and found that the appropriate factors had been used. The RRI was satisfied that the engineer had identified those supports which required analysis based on a review of the original CB&I shop drawings. The RRI also reviewed quality control documentation developed on-site by Brown & Root for one of the four restraints that had to be modified and CB&I documentation for modification of the other three. The RRI was satisfied that the pertinent quality requirements had been satisfied. The RRI also examined one of the modified units and was satisfied that the specified modification had been properly accomplished. The RRI also reviewed the licensee's efforts in regard to strengthening the vendor surveillance program in regard to these types of components and was satisfied that recent and present activities were adequate. This matter is closed.

(Closed) Unresolved Item (50-445/81-05; 50-446/81-05): Quality of Radiographs of Pipe Welds

The licensee's radiographic interpreters have completed an audit of approximately 1500 sets of radiographs covering all three safety class weld groups. The licensee's report indicated that approximately 170

radiographs had to be redone in order to satisfy the newer, more definitive criteria established by the site radiographic procedures. The RRI verified the effectiveness of the audit effort by re-reviewing the welds originally examined by him to establish the extent of the problem related in the above referenced inspection report. The RRI's selected radiographs were not at any time revealed to the licensee. The re-review revealed that four of the six radiographic film sets displaying poor shooting technique had been reshot in a satisfactory manner.

The other two sets of film had not been reshot but had been included in the audit and found satisfactory in relation to the revised procedures. The RRI had no further questions on this matter.

(Closed) Unresolved Item (50-446/81-11): Carbon Steel Abraided into a Reactor Coolant Pump Casing

Brown & Root Quality Assurance issued Nonconformance Report M-2883 on August 5, 1981, documenting the observation by the RRI and a B&R QC inspector of a carbon steel cable in hard contact with the exterior pump casing of Reactor Coolant Pump TCX-RCPCPC-02. The engineer's instructions, concurred with by the pump vendor (Westinghouse), were to mechanically clean the contact area with a follow-up cleaning with acetone and demineralized water. An inspection report by B&R QC stated that the required work was accomplished. The RRI observed that the contact area on the pump had been mechancially cleaned and had no further questions on this matter.

3. Action on Licensee Identified Design/Construction Deficiencies

(Closed) Revised Load Rating for One Inch Concrete Anchor Bolts

On September 11, 1980, Hilti, Inc. notified the NRC via a 10 CFR 21 report that they had discovered in a series of recent tests that their one inch diameter anchor bolt failed at a load of 23441 lbs., rather than the advertised value of 27500 lbs. Hilti, Inc. subsequently notified the nuclear users of their device that their previously stated load factor was in error. The licensee followed up this notification by Hilti by informing the RRI of the existence of a potentially reportable item in accordance with 10 CFR 50.55(e). By letter dated August 31, 1981, the licensee notified the NRC that after evaluation, they do not consider the item to be formally reportable. The RRI reviewed data provided by Hilti which indicated that because of the much larger sample size used in the recent tests, the confidence factors in the average strength characteristic of the anchor bolts are sufficiently high that a somewhat lower safety factor could be employed in engineering design even though the average developed strength has decreased. The licensee's A/E has reviewed the Hilti data and agreed with the logic but has also stipulated that all future design efforts utilizing the anchor bolt of one inch size use the reduced strength criteria while continuing to use the more conservative safety factors of four or five to one. The licensee also determined

that he would review all existing pipe hanger/support designs which used the one inch bolts to the older strength criteria. Those designs which will not satisfy the licensee's commitment contained in the response to NRC IE Bulletin 79-02 of a 5 to 1 safety factor will be corrected on a case-by-case basis. The RRI discussed the licensee's position with an NRC engineer who has followed this situation closely on a national basis. The engineer advised the RRI that the licensee's position appeared reasonable. The RRI had no further questions and the matter is considered closed.

4. Site Tour

The RRI toured each safety-related work area at least once during the inspection period to observe the status of construction and to observe the overall construction practices being followed by the craft labor personnel. The RRI also observed the activities of the quality control personnel in various areas regarding their ready availability and on occasion, their apparent diligence in the performance of inspections. The RRI observed that craft labor personnel appeared knowledgeable of their responsibilities and that the QC personnel were diligent in the performance of their inspections.

No violations or deviations were identified.

5. Safety-Related Pipe Installation and Welding

The RRI observed a number of welders making new and repair welds during the inspection period, primarily those involved in a modification effort on the Chemical and Volume Control piping system. All of the welds observed were being accomplished by the manual gas tungsten arc process by persons well known to the RRI as qualified welders. No special note of the welder identification or of the welds observed was made by the RRI because of his familarity with both the process and the welders. During one of the inspections, the RRI noted that a weld had been ground into a considerable depth, about a quarter of the way around the pipe. The RRI interviewed the person performing the grinding and learned that he was attempting to remove a defect that had been identified by a radiograph of the previously completed weld. A review of the weld documentation in the possession of the person indicated that this was the first attempt to repair the weld after it had been rejected. The weld number was suffixed by an 'A' which indicated that an earlier weld at the same location had been cut completely out. The welder remarked that he remembered that the earlier original weld had also been repaired a number of times prior to being accepted. The RRI obtained and reviewed the records pertaining to to the original weld and found that it had been repaired three times before being accepted. The record also indicated that the A/E's welding engineer had consented to the third repair as required by Project Specification MS-100 which prohibits more than two repairs to a weld joint, except with the A/E's consent. The records for the 'A' weld and the repair thereto, however, did not so indicate the A/E's approval. In effect, five repair

actions have now been taken on the joint, giving rise to the possibility of sensitization of the base metal heat affected zones without proper engineering evaluation. During the past three years, the RRI has evaluated comparable situations a number of times and each time had found that the evaluations had been performed in a conservative manner by persons considered competent in the field. The RRI, therefore, considered the reported case to be of an isolated nature rather than a program deficiency. Discussions with the Brown & Root Project Quality Assurance Manager, and the Brown & Root Project Welding Engineer, along with earlier discussions with the engineer now designated the responsibility for the repair analysis, indicated that while a workable program has been functioning, the program is poorly documented with poorly defined responsibilities for both the detection of multiple repair actions under some circumstances and with little written criteria for the analytical process. The B&R QA Manager also stated that a Nonconformance Report would be issued relative to the specific joint involved, FW-19A, as identified on isometric CS-1-AB-04, and that appropriate corrective measures would be taken. This matter will be considered unresolved until completion of those actions required by the Nonconformance Report and appropriate refinement of the controlling procedures for weld repair control.

The RRI examined the below listed radiographs pertaining to Safety Class 1 pipe welds for conformance to ASME Section III for weld quality, and ASME Section V for quality of the radiographs themselves:

Weld No.	Isometric No.	Line No.
FW-23, FW-19-2A, FW-24, FW-25 & FW-15	RC-1-RB-015	3-RC-1-111-2501R1
FW-43, FW-38	RC-1-RB-015	3-RC-1-146-2501R1
FW-2-1, FW-10, DW-4	CS-1-RB-029	2-CS-1-112-2501R1
FW-24	RC-1-RB-015	3-RC-1-110-2501R1
FW-13A, FW-1	RC-1-RB-015	3-RC-1-108-2501R1
FW-16	SI-1RB-060	10-SI-RB-181-2501R1
FW-1	RH-1-RB-01	12-RH-1-001-2501R1
FW-25, FW-24A	RC-1-RB-031	3-RC-1-157-2501R1
FW-3-2	RC-1-RB-016	4-RC-1-091-2501R1
FW-4	RC-1-RB-028A	6-RC-1-100-2501R1
FW-12, FW-13 & FW-14	RC-2-520-01	Unit 2 RC Pipe Loop 2 Crossover

No violations or deviations were identified.

6. Protection of Major Installed Equipment

The RRI observed that the reactor vessels and internals for both units remain well protected. Electric motors for pumps and valves were noted to be hand-warm in relation to surrounding metals, and thus protected from moisture. The motor control centers and switchgear in Unit 1 were energized sufficiently for the space heaters to be operative while the comparable items in Unit 2 were covered and heated with external heaters.

No violations or deviations were identified.

7. Other Inspection Activities

The RRI assisted Region IV based Engineering Inspection Specialists and Investigators during the course of inspections of pipe support systems and the investigations of allegations. The results of these inspections and investigations are documented in IE Reports 50-445/81-13; 50-446/81-13; and 50-445/81-12; 50-446/81-12, respectively.

8. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. One such item disclosed during the inspection is discussed in paragraph 5.

9. Management Interviews

The RRI met with one or more of the persons identified in paragraph 1 on August 5, 10, 13, 17, and 31, and on September 8, 9, 11, 21, 22, 25, and 30, 1981, to discuss inspection findings and the licensee's actions and positions.