APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Report: 50-445/82-14

Docket: 50-445 Category: A2

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

Facility Name: Comanche Peak, Unit 1

Inspection At: Comanche Peak, Unit 1

Inspection Conducted: August 3-20, 1982

Inspectors: R. T. Redano 9-28-82
for R. C. Stewart, Reactor Inspector Date
Reactor Project Section A

R. T. Redano 9-28-82
for R. G. Taylor, Senior Resident Inspector Date
(Details Section, Par. 4)

Approved: R. T Redano 9-28-82
for I. F. Westerman, Chief Date
Reactor Project Section A

Inspection Summary

Inspection Conducted During the Period August 3-20, 1982 (Report 50-445/82-14)

Areas Inspected: Special, unannounced inspection of pipe whip restraints and review of licensee's method of QC inspection of skewed welds in response to concerns expressed by former Brown & Root (B&R) QC inspector during Atomic Safety and Licensing Board (ASLB) hearings being conducted for issuance of Comanche Peak Steam Electric Station (CPSES) operating licensee. The inspection involved 110 inspector-hours by two NRC inspectors.

Results: No violations or deviations were identified. The concerns expressed by Mr. C. Atchison in his oral testimony of July 30, with regard to pipe whip restraints had been identified and corrected by the licensee. Matters regarding Mr. Atchison's allegation regarding the lack of written QC procedures for the examination of skewed fillet welds remains unresolved.

Details

1. Persons Contacted

Principal Licensee Employees

*R. G. Tolson, Site Quality Assurance Supervisor, TUGCO
B. G. Scott, Quality Engineering Supervisor, TUGCO
C. T. Brandt, QA/QC Supervisor - Mechanical/Civil, TUGCO
W. Hartshorn, Quality Engineer, TUGCO
W. Wright, Project Welding Engineer, B&R
S. Ali, QA Engineer, TUGCO
R. Baker, Staff Engineer, B&R

Other Personnel

C. A. Atchison
*G. Purdy, Project Quality Assurance Manager, B&R

*Denotes those persons attending management interviews

The NRC inspectors also contacted other licensee and contractor employees during the course of the inspection.

2. Atchison's Concern Regarding Quality of Welding of NPS Industries (NPSI) Pipe Whip Restraints

During the Comanche Peak evidentiary hearing session on July 30, 1982, before the presiding ASLB regarding Contention 5 (construction QA/QC), Citzens Association for Sound Energy (CASE) witness, C. A. Atchison, made the following statement 1/ in response to some questions concerning the safety for operating purposes of the Comanche Peak Nuclear Power Plant.

"Q. Are there any physical defects at Comanche Peak Nuclear Power Station of any nuclear safety significance that you have personal knowledge of that have not been corrected?

"A. Not being an engineer, I can only relate to what I personally observed. On the NPSI pipe whip restraints, which has not fully been looked at or investigated, the 588 material that is used in those, during the welding process has extreme warpage to it. The angle provided for

1/ Transcript, July 30, 1982, before the Atomic Safety Board, pages 3458, 3459, and 3460.

a fit-up on the main steam lines for these were not addressed in Welding Procedure WPS-10047 at that site. The configurations of these, and the warpage of the pre-welded, or the vendor welder items, are as bad and in some cases worse than those supplied on the CB&I pipe whip restraints.

"To my knowledge, these defects in welding may or may not constitute a defect that could be injurious to the plant or the failure to a safety system. My concern is, as a utility payer, as an inspector on the jobsite, if I'm going to pay for a Cadillac, I want a Cadillac, I don't want a Ford, to kind of paraphrase it.

"The items there, they would rather -- management say these are no problems and try to cover up and go on in order to get the plant on line as soon as possible to recover the money. That's a heavily invested area.

"Q. Well, sir, these items that you mentioned, were these the subject of your inspections or investigations?

"A. Yes, they are.

"Q. Did you file NCR's on these items?

"A. An NCR, in my scope of responsibility on the pipe whip restraints, yes, I was -- there was not an NCR filed on the vendor supplied items of NPSI. The first step, first one that I was able to get through was the one that I had filed on the four pieces on the pipe whip restraints furnished by CB&I.

"Shortly thereafter I was terminated, and there was never an NCR generated on the vendor defects of the welds on the NPSI pipe whip restraints.

"Q. Do you know if that was or is being looked into, sir?

"A. I do not."

In an effort to determine the specific pipe whip components of Mr. Atchison's concern, Mr. Atchison was requested, by members of the NRC Region IV staff, to visit the NRC Region IV office to discuss the matter.

In a brief meeting, held on August 17, 1982, Mr. Atchison was provided copies of CPSES detail and installation drawings on which he delineated the areas's of his concerns. On Gibbs and Hill (G&H) Installation Drawing No. 2323-SI-0671, "Safeguards Building Pipe Whip Restraint Supports, SH 5," Revision 2, Mr. Atchison identified five girder attachment field welds, NPSI vendor welds, and the corner field welds on 4 feet 6-inch by 4 feet 6-inch box-type structure of which he stated has an unqualified

joint. (Detail-3 of TUSI Drawing 2323-51-0671-01) The G&H Drawing, 2323-SI0671, is the installation drawing of the outside main steam line(s) pipe whip restraint on top of the safeguards building. The structure was fabricated by NPSI and assembled by bolting and field welding by B&R. In addition, Mr. Atchison stated that he had observed other NPSI components in a "lay-down" area on top of the adjacent switchgear building that had warpage and code rejectable welding.

3. NRC Site Inspection Followup

a. Initial Documentation Review and Inspection

During the period August 3-13, 1982, the NRC inspectors conducted an independent onsite documentation review and sampling inspection of NPSI-supplied components. Documents reviewed included the following:

- CPSES FSAR, Section 3.6
- NPS Industries, Inc., Contract CPD-0363, dated July 17, 1980
- NPS Industries, Inc., Contract CPD-0324, dated March 12, 1980
- NPS Industries, Inc., Control CPD-0351, dated June 19, 1980
- NPS Industries, Inc., Contract CPD-0403, dated October 23, 1980
- G&H Specification SS-16B
- B&R Weld Procedure WPS-10046
- TUGCO Procedure QI-QP-11.14.3, "Inspection of Structural/ Miscellaneous Steel Welding," Revision 6, dated May 21, 1982
- G&H Drawings 2323-S1-0576, Figures 2 through 6, "Pipe Bumper Restraint Details"
- AWS D1.1, Structural Welding Code

During the documentation review the inspectors observed that, with regard to pipe whip restraints, NPSI contracts are essentially limited to providing (crushable) pipe bumper restraints, miscellaneous structural supports for the auxiliary and turbine buildings, and the large main steam/feedwater pipe whip restraint structure on top of the safeguards building. Aside from the crushable pipe bumpers and one support assembly at the 823 foot level, there are no NPSI-supplied pipe whip restraints inside containment. The inspectors also noted that the G&H Specification SS-16B and related drawing details called for design fabrication and installation of the component structures be preformed in accordance with American Institute of Steel Construction (AISC) Specification for "The Design Fabrication

and Erection of Structural Steel for Buildings" and the American Welding Society (AWS), "Structural Welding Code," D1.1

In conjunction with the documentation review, and in view of Mr. Atchison's testimony, the inspector conducted a random sampling inspection of the NPSI-supplied component supports and pipe bumper assemblies. Although no pipe bumpers were installed, the inspector examined approximately 20 bumper assemblies located in various outside storage areas. In addition, the inspector examined sections of the main steam/feedwater pipe whip restraint on top of the safeguards building and the one NPSI structure at elevation 823 feet in the Unit 1 reactor containment building. There were no observed defects, warpage, or discontinuities that would be considered unacceptable within the AWS Structural Welding Code, D1.1. It was observed by the inspector that, due to the particular weld configuration, slight warpage had occurred on some of the pipe bumpers; however, these were considered acceptable with in the AWS Code, Section 3.4, Limitations.

b. Additional Followup on Mr. Atchison's Concerns

Subsequent to Mr. Atchison's visit to the Region IV office on August 17, 1982, the NRC inspector returned to the site, during the period August 19-20, 1982, to review the specific areas identified by him.

With regard to the five girder welds, the NRC inspector observed that a Nonconformance Report (NCR) M8100846, dated August 19, 1981, identified these areas of unacceptable welds. Repairs were completed July 13, 1982, and final NDE (VT, MT, and UT) inspections completed during the period August 4-9, 1982. The NRC inspectors made a visual inspection of the specific welds and found no discrepancies.

With regard to the alleged unqualified corner field welds on the four 4 feet 6-inch by 4 feet 6-inch box structures on the main steam/feedwater pipe whip restraint, the AWS "Structural Welding Code," D1.1, page 74, figure 2.9.1, depicts a prequalified weld joint identical to that described by Mr. Atchison and as shown on NPSI shop drawings. In addition, the NRC inspector made a visual examination of 8 of the total of 16 corner field welds. There were no defects or discrepancies observed. QC inspection records reflect UT examinations were completed and found acceptable on July 2, 1982.

With regard to Mr. Atchison's observation of other NPSI fabricated pipe whip restraints on the switchgear building and which contain unacceptable welds, the NRC inspector made a random selection of five pipe whip restraints from drawing 2323-SI-0474 "Turbine Building Switchgear Area," Revision 8, as follows: MS-1-07-908-757W, MS-1-22-906-T57W, FW-1-11-902-557W, MS-1-22-904-757W, and MS-1-17-904-T57W. The NRC inspector examined the five installed assemblies and found no apparent defects or discrep[illegible] It was also observed that pipe whip restraints on the turbine and switchgear

buildings are classified as "non-nuclear safety-related," QA program applicable to procurement and shop fabrication only.

4. Review of Licensee's Method of QC Inspection of Skewed Welds

Subsequent to Mr. Atchinson's testimony on July 30, 1982, Mr. Atchison made a statement to an NRC investigator alleging that the licensee's QC inspection procedure for welding did not contain written instructions for examining skewed fillet welds.

Skewed welds are those joining two structural members that are other than in the same plane and are not perpendicular to each other. A typical example is two members joined at an angle of 45° with a weld at the joint toe of 135° and another at the heel of 45°. The senior resident inspector-construction (SRIC) has reviewed the several quality assurance procedures that might be expected to provide inspection instruction on the measurement verification that such welds are of specified size. None of the procedures reviewed contained any such instructions but it was found that instruction had been given to the welding QC inspectors during training classes and the written examination given the welding QC inspectors contained a specific question dealing with the measurement of such welds as a part of their certification process to be qualified inspectors. The SRIC interviewed one experienced QC inspector for the purposes of having the inspector explain the measurement process that he had been using during the past several years on skewed welds. The process the person described was consistent with that previously described by a person who at one time had been an instructor in the inspection training courses. The SRIC would further note that during the many inspections of structural weldments conducted by both the SRIC and other NRC inspectors, there has been no indication of undersized skewed fillet welds. The allegation that the QC procedures do not address inspection of skewed welds is therefore, substantiated but it has not been established that there are any safety-related consequences of the lack of procedural addressment since apparently adequate training was given to the QC personnel. In order to provide additional assurance that the instructions have been effective, B&R QA management has initiated a reinspection of randomly selected skewed welds based upon statistical sampling techniques. The licensee QA supervisor has stated that appropriate QC procedures will be revised to address in detail the inspection techniques to be used both for the random reinspection effort and for future inspections. This matter will be considered unresolved pending a review of the revised procedures and the outcome of the reinspection effort.

5. Unresolved Item

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. One unresolved item is identified in paragraph 4 of this report.

6. Management Interview

The SRIC held a management interview on August 26, 1982, with the persons identified in paragraph 1 to discuss inspection findings and to confirm the commitments stated in paragraph 4.

NRC FORM 766 (11-81) IE MC 0535

U.S. NUCLEAR REGULATORY COMMISSION

INSPECTOR'S REPORT
Office of Inspection and Enforcement

PRINCIPAL INSPECTOR (Name, last, first, and middle initial): R. G. TAYLOR, R.G.

REVIEWER: T. WESTERMAN

INSPECTORS: R.G. STEWART
R.G. TAYLOR

LICENSEE/VENDOR	TRANSACTION TYPE	DOCKET NO. (8 digits) OR LICENSE NO. (BY PRODUCT) (13 digits)	REPORT NO.	REPORT SEQ.	NEXT INSPEC. DATE MO.	NEXT INSPEC. DATE YR.
TUGCO	I – INSERT M – MODIFY D – DELETE R – REPLACE	0 5 0 0 0 4 4 5	8 2 1 4	A B C D		
	1	2 – 14	15 – 18			

PERIOD OF INVESTIGATION/INSPECTION FROM MO.	DAY	YR.	TO MO.	DAY	YR.	INSPECTION PERFORMED BY	ORGANIZATION CODE OF REGION/HQ CONDUCTING ACTIVITY (See IEMC 0530 Manpower Reporting—Weekly Manpower Reporting for code.) REGION	DIVISION	BRANCH
0 8	0 3	8 2	0 8	2 0	8 2	X 1 – REGIONAL OFFICE STAFF X 2 – RESIDENT INSPECTOR 3 – PERFORMANCE APPRAISAL TEAM OTHER	4	A	1
20		25	26		31	32	33	34	35

REGIONAL ACTION (Check one box only)	TYPE OF ACTIVITY CONDUCTED (Check one box only)			
1 – NRC FORM 591 X 2 – REGIONAL OFFICE LETTER	X 02 – SAFETY 03 – INCIDENT 04 – ENFORCEMENT 05 – MGMT. AUDIT	X 06 – MGMT. VISIT 07 – SPECIAL 08 – VENDOR 09 – MAT. ACCT.	10 – PLANT SEC. 11 – INVENT. VER. 12 – SHIPMENT/EXPORT 13 – IMPORT	14 – INQUIRY 15 – INVESTIGATION
36	37-38			

INSPECTION/INVESTIGATION FINDINGS (Check one box only) A	B	C	D	TOTAL NUMBER OF VIOLATIONS AND DEVIATIONS A	B	C	D	ENFORCEMENT CONFERENCE HELD A	B	C	D	REPORT CONTAIN 2.790 INFORMATION A	B	C	D	LETTER OR REPORT TRANSMITTAL DATE NRC FORM 591 OR REG. LETTER IS SUED MO.	DAY	YR.	REPORT SENT TO HQ. FOR ACTION MO.	DAY	YR.
X																SEP	29	1982			
1 – CLEAR 2 – VIOLATION 3 – DEVIATION 4 – VIOLATION & DEVIATION				1 – YES				1 – YES				1 – YES				44		49	50		55
39				40-41				42				43									

MODULE INFORMATION

REC ORD TYPE	MODULE NUMBER INSP NUMBER	PHASE	MANUAL CHAPTER	PROCEDURE NUMBER	LEVEL	SEQ *	PRIORITY	DIRECT INSPECTION EFFORT IN STAFF HOURS EXPENDED THIS INSPECTION	PERCENTAGE COMPLETED TO DATE	STATUS	MODULE REQ. FOLLOWUP PHASE	MANUAL CHAPTER	PROCEDURE NUMBER	LEVEL
B		2	9 2 7	0 6	3	A		1 1 0						
						B								
						C								
						D								
B						A								
						B								
						C								
						D								
B						A								
						B								
						C								
						D								
B						A								
						B								
						C								
						D								

* CIRCLE SEQUENCE IF VIOLATION OR DEVIATION

1 2 3 4 5 – 10 | 12 13 – 15 | 16 – 18 | 19 | 20 | 21 | / 26

MODULE INFORMATION

REC ORD TYPE	MODULE NUMBER INSP NUMBER	PHASE	MANUAL CHAPTER	PROCEDURE NUMBER	LEVEL	SEQ *	PRIORITY	DIRECT INSPECTION EFFORT IN STAFF HOURS EXPENDED THIS INSPECTION	PERCENTAGE COMPLETED TO DATE	STATUS	MODULE REQ. FOLLOWUP PHASE	MANUAL CHAPTER	PROCEDURE NUMBER	LEVEL
B						A								
						B								
						C								
						D								
B						A								
						B								
						C								
						D								
B						A								
						B								
						C								
						D								
B						A								
						B								
						C								
						D								

1 2 3 4 5 – 10 | 12 13 – 15 | 16 – 18 | 19 | 20 | 21 | / 26