UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406

AUG 31 1989

MEMORANDUM FOR: Christopher I. Grimes, Director
Comanche Peak Project Division
Office of Special Projects

FROM: Bruce A. Boger, Acting Director
Division of Reactor Safety, RI

SUBJECT: NRC NDE INDEPENDENT MEASUREMENTS INSPECTION AT COMANCHE PEAK, UNIT 1

Per your request, we conducted an inspection with the NRC mobile nondestructive testing laboratory at Comanche Peak Unit 1 during the period July 17 through 27, 1989. This inspection focused on preservice inspection (PSI), licensee actions to disposition construction deficiencies and the licensee's erosion-corrosion program. Our inspection report is enclosed.

Based on the inspection, performance of the PSI inspection contractor and the licensee's oversight of the PSI contractor activities need significant improvement. In addition, we want to highlight the licensee's inadequate corrective actions taken with regard to two different problems dealing with containment penetrations. These findings led to identification of three violations and three unresolved items. The notices of violation (Appendix A to the enclosed report) are included for your use. We suggest that the licensee be requested to review Comanche Peak Unit 2 activities for similar types of violations and unresolved issues. Timely identification and resolution of these types of deficiencies are important.

We hope this independent measurement inspection and documentation fulfill your needs. Please contact us if we can be of further service with regard to the issues identified in the Comanche Peak inspection.

We offer our services in the future and solicit any comments or recommendations regarding improvement of the NDE mobile laboratory program to better serve NRC needs.

B A Boger

Bruce Boger, Acting Director
Division of Reactor Safety, RI

cc w/attachments:
C. Y. Cheng, NRR
H. H. Livermore (Comanche Peak)
I. Barnes, RIV
H. Kerch, RI
J. Strosnider, RI

C13

C. 10 CFR 50, Appendix B, Criterion XVI requires that deficiencies are promptly identified and corrected.

Contrary to the above, the licensee did not correct deficiencies identified in the fabrication of fuel transfer tube penetration welds. Fuel transfer tube penetration welds 1A, 1B, 2A and 2B were radiographed and rejected on June 3, 1989 because of welding defects not acceptable by the applicable construction codes and specifications. The nonconforming conditions were documented by the licensee in NCR 89-04023, dated April 4, 1989. On June 20, 1989, Site Engineering inappropriately dispositioned NCR 89-04023, Rev. 1 "accept-as-is." The licensee's basis for acceptance of the welds relied on stress analyses that are not technically acceptable substitutes for the required ASME III nondestructive examinations.

This is a Severity Level IV violation. (Supplement II)

Pursuant to the provisions of 10 CFR 2.201, Texas Utilities, Comanche Peak Unit 1 is hereby required to submit to this office within thirty days of the date of the letter which transmitted this Notice, a written statement or explanation in reply, including: (1) the corrective steps which have been taken and the results achieved; (2) corrective steps which will be taken to avoid further violations; and (3) the date when full compliance will be achieved. Where good cause is shown, consideration will be given to extending this response time.

NRC FORM 798 (11-81) (E MC 0536)

U.S. NUCLEAR REGULATORY COMMISSION

INSPECTOR'S REPORT
Office of Inspection and Enforcement

PRINCIPAL INSPECTOR (Name: last, first, and middle initial): KERCH, HARRY W.

REVIEWER:

INSPECTORS: RICHARD M. HARRIS
MICHAEL A. OLIVER

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
TU ELECTRIC COMANCHE PEAK STEAM ELECTRIC STATION	X I - INSERT M - MODIFY D - DELETE R - REPLACE	0 5 0 0 0 4 4 5	8 9 3 8	A B C D		

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 codes) REGION	DIVISION	BRANCH
0 7	1 7	8 9	0 7	2 8	8 9	✓ 1 - REGIONAL OFFICE STAFF 2 - RESIDENT INSPECTOR 3 - PERFORMANCE APPRAISAL TEAM OTHER	I	DRS	EB

REGIONAL ACTION (Check one box only)
- 1 - NRC FORM 591
- 2 - REGIONAL OFFICE LETTER

TYPE OF ACTIVITY CONDUCTED (Check one box only)
- ✓ 02 - SAFETY
- 03 - INCIDENT
- 04 - ENFORCEMENT
- 05 - MGMT AUDIT
- 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

INSPECTION/INVESTIGATION FINDINGS (Check one box only)

A	B	C	D	
				1 - CLEAR
				2 - VIOLATION
				3 - DEVIATION
				4 - VIOLATION & DEVIATION

TOTAL NUMBER OF VIOLATIONS AND DEVIATIONS				ENFORCEMENT CONFERENCE HELD				REPORT CONTAINS 2.790 INFORMATION				LETTER OR REPORT TRANSMITTAL DATE: NRC FORM 591 OR REG LETTER ISSUED MO	DAY	YR	REPORT SENT TO HQ FOR ACTION MO	DAY	YR
A	B	C	D	A	B	C	D	A	B	C	D						
				1 - YES				1 - YES									

MODULE INFORMATION

REC ORD TYPE	MODULE NUMBER INSP NUMBER	PHASE	MANUAL CHAPTER	PROCEDURE NUMBER	LEVEL	SEQ #	PRIORITY	DIRECT INSPEC TIME (EFFORT IN STAFF HOURS EXPENDED THIS INSPECTION)	PERCENTAGE COMPLETED TO DATE	STATUS	MODULE REQ FOLLOWUP PHASE	MANUAL CHAPTER	PROCEDURE NUMBER	LEVEL
* 1	2	3	0	7	0 3 8	A		4						
	EMTS/ENFORCEMENTS					B								
						C								
						D								
* 2	2	7	3	0	5 1 1	A		25	100					
	Program					B								
						C								
						D								
* 3	2	7	3	0	5 2	A		20	100					
	Procedures					B								
						C								
						D								
* 4	2	7	3	0	5 3 8	A		23	100					
	PSI OBSERVATION					B								
						C								
						D								

* CIRCLE SEQUENCE # VIOLATION OR DEVIATION

MODULE INFORMATION

REC ORD TYPE	MODULE NUMBER INSP NUMBER	PHASE	MANUAL CHAPTER	PROCEDURE NUMBER	LEVEL	SEQ #	PRIORITY	DIRECT INSPEC TIME (EFFORT IN STAFF HOURS EXPENDED THIS INSPECTION)	PERCENTAGE COMPLETED TO DATE	STATUS	MODULE REQ FOLLOWUP PHASE	MANUAL CHAPTER	PROCEDURE NUMBER	LEVEL
* 5	2	7	3	0	5 5 8	A		20	100					
	PSI DATA					B								
						C								
						D								
* 6	2	5	5	1	5 0	A		20	100					
						B								
						C								
						D								
* 7	2	5	7	0	5 0	A		27	100					
						B								
						C								
						D								
* 8	2	5	7	0	6 0	A		30	100					
						B								
						C								
						D								

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): KERCH, HARRY W

REVIEWER:

INSPECTORS: RICHARD H. HARRIS; MICHAEL A. OLIVERI

LICENSEE VENDOR: TU ELECTRIC COMMANCHE PEAK STEAM ELECTRIC STATION

TRANSACTION TYPE: X I - INSERT; M - MODIFY; D - DELETE; R - REPLACE

DOCKET NO. (8 digits) OR LICENSE NO. (BY PRODUCT) (13 digits): 05000445

REPORT NO.: 8938 | SEQ: A, B, C, D

NEXT INSPEC. DATE: MO | YR

PERIOD OF INVESTIGATION/INSPECTION					
FROM			TO		
MO	DAY	YR	MO	DAY	YR
07	17	89	07	28	89

INSPECTION PERFORMED BY: 1 - REGIONAL OFFICE STAFF; 2 - RESIDENT INSPECTOR; 3 - PERFORMANCE APPRAISAL TEAM; OTHER

ORGANIZATION CODE OF REGION/HQ CONDUCTING ACTIVITY (See IEMC 0530 "Manpower Reporting—Weekly Manpower Reporting" for code.)

REGION	DIVISION	BRANCH
I	OCS	EB

REGIONAL ACTION (Check one box only): 1 - NRC FORM 591; 2 - REGIONAL OFFICE LETTER

TYPE OF ACTIVITY CONDUCTED (Check one box only): ✓ 02 - SAFETY; 03 - INCIDENT; 04 - ENFORCEMENT; 05 - MGMT. AUDIT; 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

INSPECTION/INVESTIGATION FINDINGS (Check one box only): A B C D — 1 - CLEAR; 2 - VIOLATION; 3 - DEVIATION; 4 - VIOLATION & DEVIATION

TOTAL NUMBER OF VIOLATIONS AND DEVIATIONS: A B C D

ENFORCEMENT CONFERENCE HELD: A B C D — 1 - YES

REPORT CONTAIN 2.790 INFORMATION: A B C D — 1 - YES

LETTER OR REPORT TRANSMITTAL DATE: NRC FORM 591 OR REG. LETTER ISSUED (MO DAY YR); REPORT SENT TO HQ FOR ACTION (MO DAY YR)

MODULE INFORMATION

REC. ORD. TYPE	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
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						B								
						C								
						D								
8	9	2	5	7080		A		35	100					
						B								
						C								
						D								
8	9	2	5	7090		A		10	100					
						B								
						C								
						D								
8						A								
						B								
						C								
						D								

● CIRCLE SEQUENCE # VIOLATION OR DEVIATION

FACSIMILE REQUEST

Date 8/9/89

MESSAGE TO: HERBERT LIVERMORE
COMANCHE PEAK 817 897-1500

TELECOPY NUMBER: _____

NUMBER OF PAGES: 3 INCLUDING THIS REQUEST FORM

MESSAGE FROM: H. KERCH
U.S.N.R.C. REGION I KING OF PRUSSIA, PENNA.

TRANSMITTED BY: _____

DATE & TIME: _____

VERIFIED BY: _____

REG I Form 124
Feb 77

12

ASME Section V 1974

examination on vessel contact surfaces in the range of curvature from 0.9 to 1.5 times the basic calibration block diameter. For example, an 8-in. diameter curved block may be used to calibrate the examination on vessel contact surfaces in the range of curvature from 7.2 to 12 in. diameters. The curvature range from 0.94 in. to 20 in. diameter requires 6 block curvatures as indicated in Fig. T-533(b).

(d) The basic calibration block for examination of longitudinal welds shall be of essentially the same nominal diameter as the part to be examined, except that for diameters greater than 20 in., flat blocks may be used.

T-533.2 Basic Calibration Hole

(a) The basic calibration hole shown in Fig. T-533(a) shall be drilled parallel to the contact surface of the basic calibration block or the component. The location, depth, and diameter of this hole shall be obtained from the table in Fig. T-533(a).

(b) However, other calibration reflectors may be used, provided equivalent responses to that from the basic calibration hole are demonstrated.

T-534 Surface Preparation

T-534.1 Contact Surfaces. The finished contact surfaces shall be free from weld spatter and any roughness that would interfere with free movement of the search unit or impair the transmission of ultrasonic vibrations.

T-534.2 Weld Surfaces. The weld surface shall be finished so they cannot mask or be confused with reflections from defects, and should merge smoothly into the surfaces of the adjacent base materials.

T-534.3 Base Material. The volume of base material through which the sound will travel in angle beam examination shall be completely scanned with a straight beam search unit to detect reflectors which might affect interpretation of angle beam results. This is not intended as an acceptance-rejection examination.

T-535 Angle Beam Method

T-535.1 Calibration of Equipment

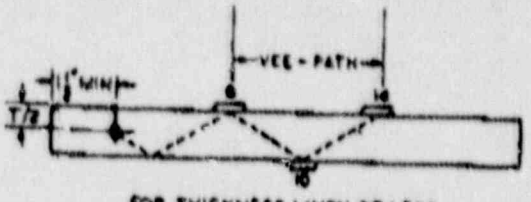
(a) Frequency— The nominal frequency shall be 2.25 MHz unless variables such as production material grain structure require the use of other frequencies to assure adequate penetration.

(b) Beam Angle— The beam angle in the production material shall be in the range of 40 to 75 deg, inclusive, with respect to the perpendicular to the entry surface.

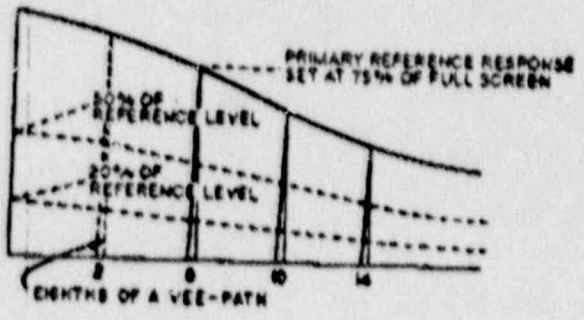
(c) Distance-Amplitude Correction— Compensation for the distance traversed by the ultrasonic beam as it passes through the material is provided by the use of the curves shown by Fig. T-535(a) or electronically.

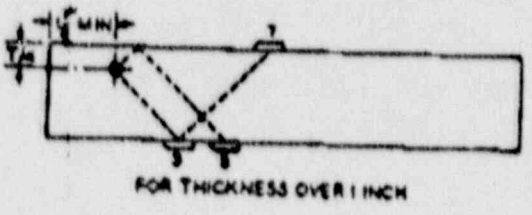
(1) Determination of Curves— Distance-amplitude correction curves shall be constructed by utilizing responses from the basic calibration hole described in T-533.2. The first point on the curve is obtained by placing the search unit as near as possible, but not less than 3/8 vee-path or 2 in., whichever is less, from the calibration hole and

attachment 8.B to Item NO1 209. Page 8.B the 2/8 does meet the 3/8 Vee-path.



FOR THICKNESS 1 INCH OR LESS





FOR THICKNESS OVER 1 INCH

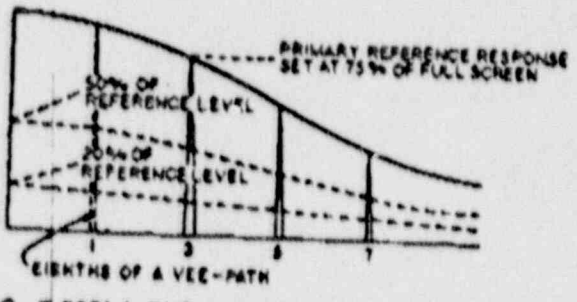
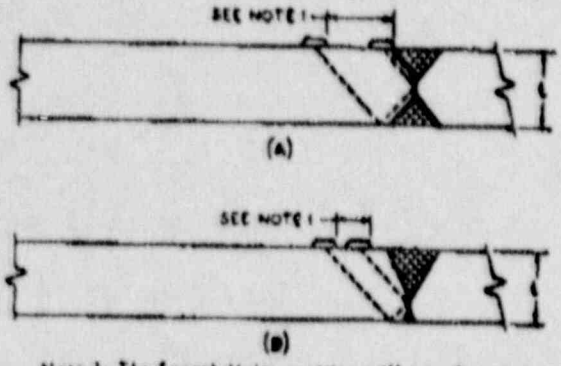


FIG. T-535(a) TYPICAL DISTANCE AMPLITUDE CORRECTION CURVE (ANGLE BEAM METHOD)
(Distance in eighths of a vee-path. For example, 14 is 1 4/8 of a vee-path.)



Note 1: The Search Units position will vary because the Search Units must be located in relationship to the sound beam travel.

FIG. T-535(b) TYPICAL DOUBLE SEARCH UNIT TECHNIQUE FOR DETECTING LACK OF PENETRATION IN DOUBLE-WELDED JOINTS

positioning for maximum response. The gain control is then set so this response is 75 percent of full screen on the cathode ray tube (CRT). This is the primary reference response. Without changing the gain, the search unit should be placed similarly at other positions covering the expected examination distance range, and the corresponding responses marked on the CRT screen. These points are joined by a smooth line whose length should cover the examination range (see Fig. T-535(a)).

(2) Electronic Distance-Amplitude Correction—If an electronic distance-amplitude correction device is used, the primary reference response shall be equalized at 50 percent of full CRT screen height over the distance range to be employed in the examination.

(d) Transfer Method—Transfer methods are used to correlate the responses from the basic calibration block and from the component. Transfer is accomplished by noting the difference between responses received from the same reference reflector in the basic calibration block and in the component and correcting for the difference.

The reference reflectors may be V notches (which must subsequently be removed), an angle beam search unit acting as a reflector, or any other reflector which will aid in accomplishing the transfer.

(1) Vessels—The transfer method shall be used at least once for each 10 ft of weld or less per plate and shall be performed at least twice for each type of welded joint.

(2) Piping—The transfer method shall be used, as a minimum, once for each welded joint for pipe sizes 10 in. in diameter and over, and once for each 5 ft of weld for pipe less than 10 in. in diameter.

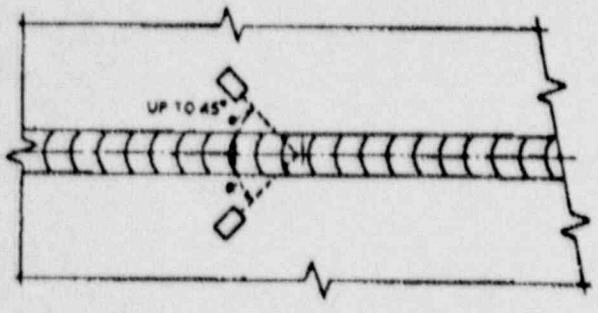


FIG. T-535(c) TYPICAL TWO SEARCH UNIT TECHNIQUE FOR DETECTING TRANSVERSE DISCONTINUITIES IN WELDED JOINTS

T-535.2 Examination Procedure

(a) Coverage—Where possible, butt welds shall be examined from both sides of the weld, usually from only one surface.

(b) Sensitivity Level—The reference level sensitivity for monitoring discontinuities is the primary reference response corrected for distance by the distance-amplitude curve or electronically, and modified by the transfer method if used. When possible, scanning shall be performed at a gain setting of 2 times (6dB) the reference level sensitivity.

(c) Reference Level—The reference level for monitoring discontinuities is the primary reference response, corrected for distance by the distance-amplitude curve or electronically, modified by the transfer method.

(d) Detection of Discontinuities Parallel to the Weld

(1) Scanning Motion—The search unit shall be placed on the contact surface with the beam aimed at about 90 deg to the weld and manipulated laterally and longitudinally so the ultrasonic beam passes through all of the weld metal in two different approaches of the beam to the reflector.

(2) Two Search Unit Technique—Techniques using two search units shown in Fig. T-535(b) may be used to detect lack of penetration in double-welded butt joints.

(e) Detection of Discontinuities Transverse to the Weld—Two search units shall be placed on the contact surfaces adjacent to the weld, one on each side, forming an angle of 45 deg or less with the axis of the weld as shown in Fig. T-535(c). As an alternate, if the weld surface has been made sufficiently smooth, one search unit may be placed on the centerline of the weld with the beam directed along the weld to scan the entire depth and width of the weld.

PANAFAX TRAMSMITTAL SHEET

COMANCHE PEAK PROJECTS DIVISION

DATE: 8/9/9

FB 346-5264

MESSAGE TO: Harry KERCH
Region I

TELECOPY NUMBER: 215-337-5324

VERIFICATION NUMBER: _____

NUMBER OF PAGES: 15 PLUS INSTRUCTION SHEET.

MESSAGE FROM: H Livermore

CONTACT: 817-897-1500

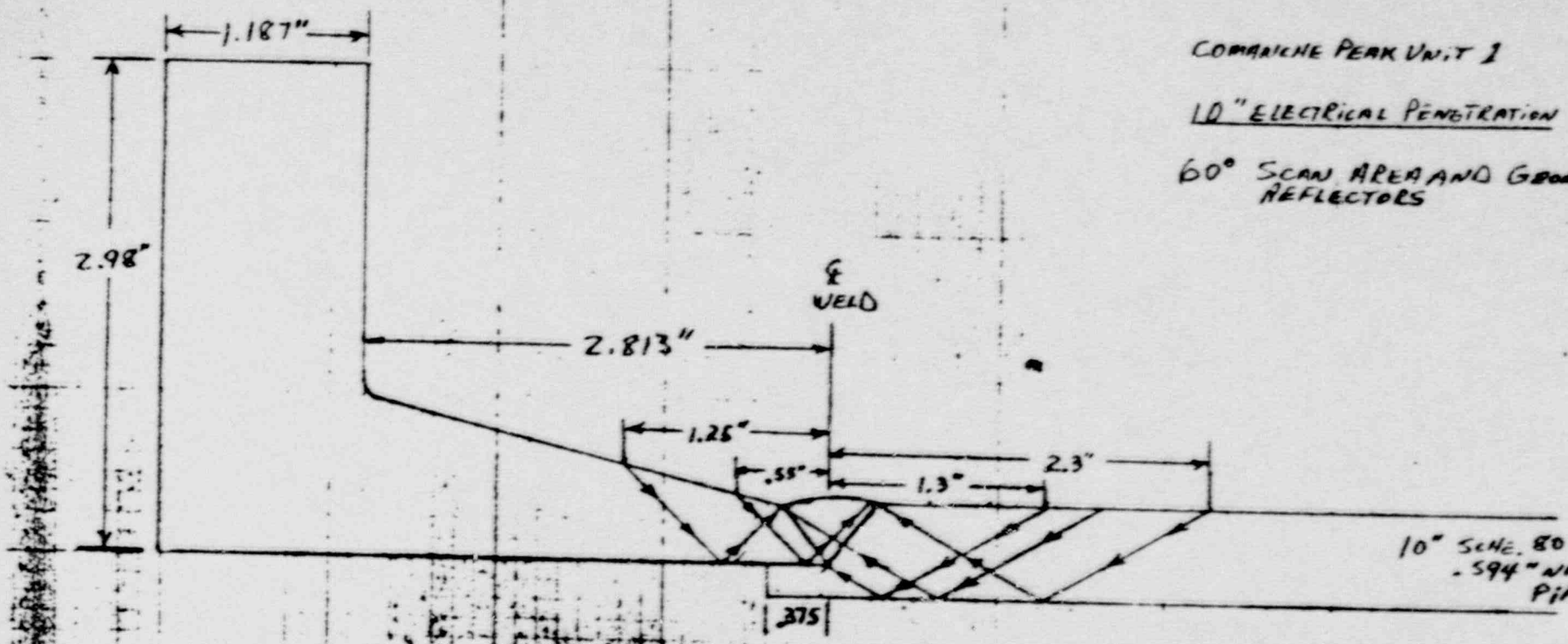
SPECIAL INSTRUCTIONS: _____

_____

COMANCHE PEAK UNIT 1

10" ELECTRICAL PENETRATION

60° SCAN AREA AND GEOMETRIC REFLECTORS



GEOMETRIC REFLECTORS FROM FLANGE SIDE

METAL PATH (M.P.)	SURFACE DISTANCE FROM WELD ℄ (W)	SOURCE
.6" TO .7"	.55" TO .65"	ROOT
1.1" TO 1.4"	.65" TO 1.25"	CROWN

GEOMETRIC REFLECTORS FROM PIPE SIDE

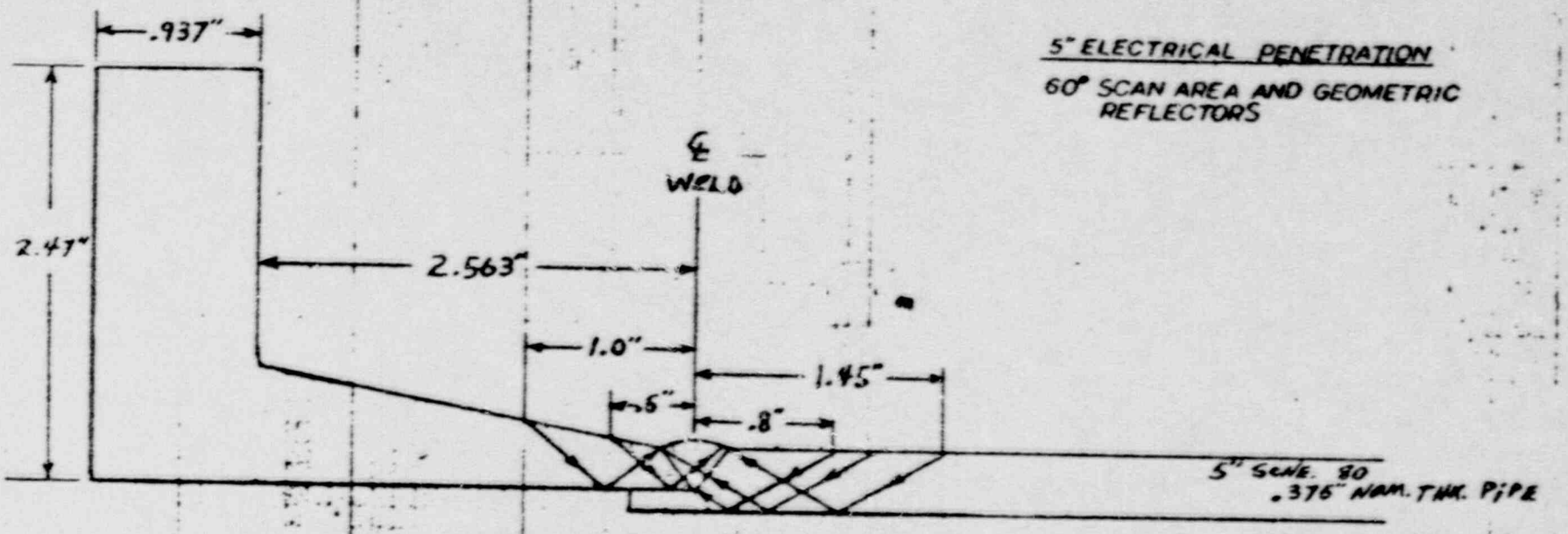
METAL PATH (M.P.)	SURFACE DISTANCE FROM WELD ℄ (W)	SOURCE
.7" TO .8"	.55" TO .65"	ROOT
1.5" TO 1.6"	.9" TO 1.0"	TOP CORNER OF LIP
2.3" TO 2.4"	1.6" TO 2.3"	CROWN
1.2" TO 1.3"	.55" TO .65"	BOTTOM CORNER OF LIP

REF. DWG. XO-2323-E-331 REV. B

COMANCHE PEAK UNIT 1

5" ELECTRICAL PENETRATION

60° SCAN AREA AND GEOMETRIC REFLECTORS



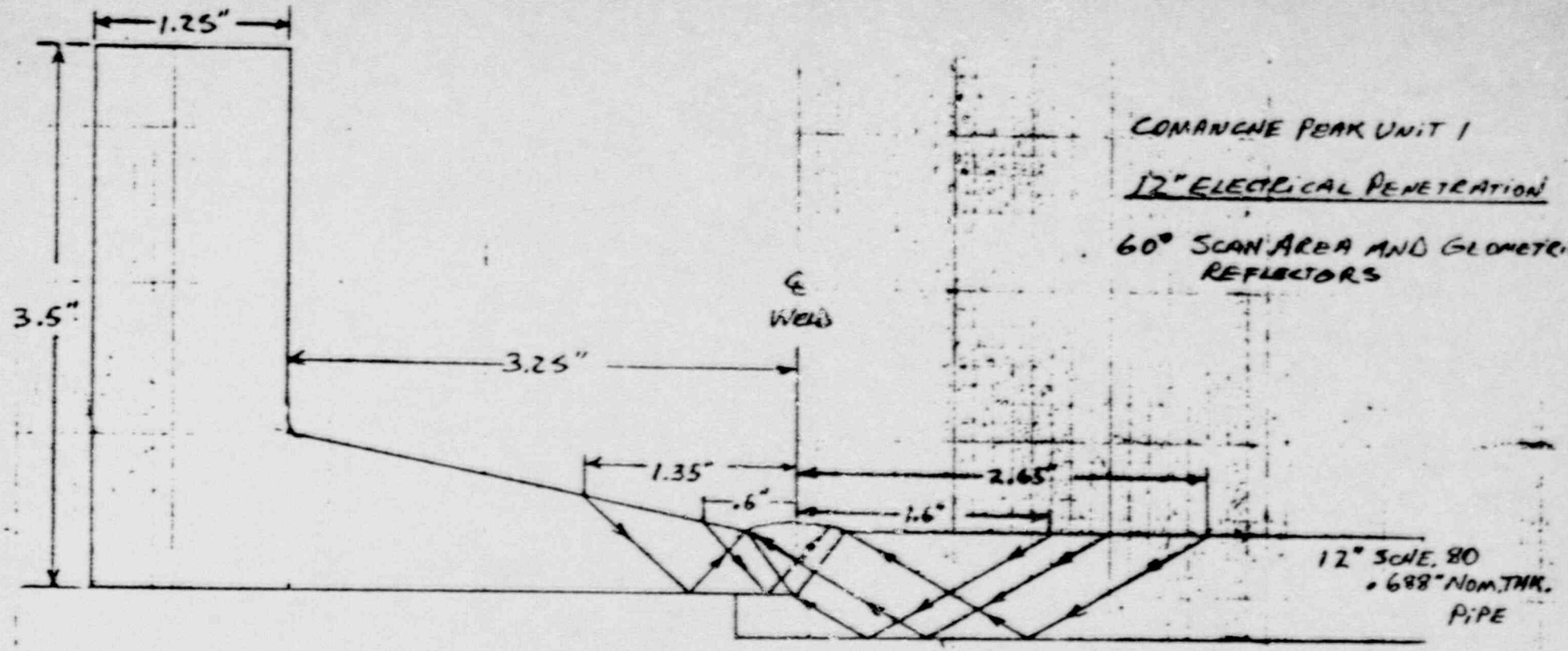
GEOMETRIC REFLECTORS FROM FLANGE SIDE

METAL PATH (MP)	SURFACE DISTANCE FROM WELD ℄ (W)	SOURCE
.5" TO .6"	.4" TO .5"	ROOT
.9" TO 1.1"	.5" TO .10"	CROWN

GEOMETRIC REFLECTORS FROM PIPE SIDE

METAL PATH (M.P.)	SURFACE DISTANCE FROM WELD ℄ (W)	SOURCE
.5" TO .6"	.3" TO .4"	ROOT
.95" TO 1.05"	.3" TO .4"	TOP CORNER OF LIP
1.4" TO 1.5"	1.05" TO 1.45"	CROWN
1.45" TO 1.55"	.75" TO .85"	BOTTOM CORNER OF LIP

REF. DWG. XD-2323-E-331 REV. B



COMANCHE PEAK UNIT 1

12" ELECTRICAL PENETRATION

60° SCAN AREA AND GEOMETRIC REFLECTORS

GEOMETRIC REFLECTORS FROM FLANGE SIDE

METAL PATH (M.P.)	SURFACE DISTANCE FROM WELD ℄ (W)	SOURCE
.6" TO .7"	.5" TO .6"	ROOT
1.2" TO 1.4"	.6" TO 1.35"	CROWN

GEOMETRIC REFLECTORS FROM PIPE SIDE

METAL PATH (M.P.)	SURFACE DISTANCE FROM WELD ℄ (W)	SOURCE
.8" TO .9"	.65" TO .75"	ROOT
1.25 TO 1.35"	.65" TO .75"	BOTTOM CORNER OF LIP
1.8" TO 2.0"	1.2" TO 1.3"	TOP CORNER OF LIP
2.6" TO 2.8"	2.0" TO 2.7"	CROWN

REF. DWG. XD-2323-E-331 REV B

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 50-445/89-38
50-446/89-38

Docket Nos. 50-445
50-446

License Nos. CPPR-126
CPPR-127

Licensee: Texas Utilities Generating
2001 Bryon Tower
Dallas, Texas 75201

Facility Name: Comanche Peak Units 1 and 2

Inspection At: Glen Rose, Texas

Inspection Conducted: July 17 through 27, 1989

Inspectors: J. Strosnider for W. W. Kerch, Senior Reactor Engineer — 8/17/89 date

J. Strosnider for R. H. Harris, NDE Technician — 8/17/89 date

J. Strosnider for M. A. Oliveri, NDE Technician — 8/17/89 date

Approved by: Jack Strosnider for J. R. Strosnider, Chief, Materials and Processes Section, EPB, DRS, Region I — 8/17/89 date

Inspection Summary and Conclusions: A routine unannounced inspection was conducted at Comanche Peak Nuclear Power Station on July 17 through July 27, 1989, Report No. 50-445/89-38.

Areas Inspected: This inspection focused on preservice inspection activities, licensee disposition of deficiencies reported, and the licensee's erosion/corrosion program.

Summary and Conclusion: Three violations and three unresolved items were identified during this inspection. Necessary corrective actions for significant deficiencies were not promptly identified and resulted in inappropriate corrective action by site engineering. Preservice ultrasonic examination data of piping weldments are of poor quality and will not be of benefit during Inservice Inspections.

DETAILS

1.0 Persons Contacted (30703)

Texas Utilities Generating (TUGCO)

S. G. McBee, NRC Interface
Susan Palmer, Stipulation Manager
Fred W. Madden, Mechanical Engineer
David L. Foken, Mechanical Engineer
Ken Pointer, Licensing Engineer
J. T. Maxwell, Quality Control Manager
W. G. Guldemond, Manager Site Licensing
S. L. Ellis, Test Manager
J. W. Muffett, Manager, Engineering
W. J. Cahill, Jr., Executive Vice President

Stone & Webster Engineering Corp. (SWEC)

Roger Smith, Engineering
M. P. Holland, Lead Structural Engineer
T. W. Houston, Group Supervisor

Citizens Association for Sound Energy (CASE)

Billie Garde, CASE Attorney

U.S. Nuclear Regulatory Commission, Comanche Peak Division

H. Livermore, Resident Inspector
R. M. Latta, Sr. Resident Inspector
P. F. McKee, Deputy Director CPPD
J. S. Weike, Reactor Engineer
R. F. Warnick, Reactor Engineer

The above listed personnel were present at the exit meeting. The inspector also contacted other administrative and technical personnel during the inspection.

2.0 Independent Measurements - NRC Nondestructive Examination and Quality Records Review

During the period of July 17 through July 27, 1989 an onsite independent inspection was conducted at Comanche Peak Nuclear Power Station. The inspection was conducted by NRC regional based inspectors. The objectives of this inspection were to assess the adequacy of the

licensee's preservice inspection program, welding quality control program, and erosion/corrosion program. The licensee's actions regarding verification of the "As-Built" configuration of pipe hanger/supports and the licensee's actions to disposition identified construction deficiencies were evaluated. Examinations required of the licensee by regulations and codes were reperformed by the NRC inspectors.

2.1 Nondestructive Examinations (NDE)

Visual Examination of Pipe Welds (57050)(55150)

Forty-two safety related pipe weldments and adjacent base material (1/2 inch on either side of the weld) were visually examined in accordance with NRC procedure NDE-10, Rev. 0, Appendix A, and associated site QC documents isometrics and as-built drawings. Included in this inspection were ASME Class 1 and 2 pipe weldments selected from the Safety Injection (SI) and Chemical Volume Control (CS) Systems. This examination was performed specifically to identify any cracks or linear indications, gouges, leakage, arc strikes with craters, or corrosion, which may infringe upon the minimum pipe wall thickness.

Results

The welding and overall workmanship inspected were satisfactory. No violations were identified.

Visual Inspection of Hangers/Supports (57050)

During this inspection fifty-six safety related hanger/supports were visually inspected per NRC procedure NDE-10, Rev. 0, Appendix A and B in conjunction with site QC documents, isometric/drawings. Included in this inspection were hanger/supports selected from the Safety Injection (SI), Chemical Volume Control (CS), Reactor Coolant (RC) and Residual Heat Removal (RHR) Systems. In the areas of welds, the accessible surface area and adjacent base metal for a distance of one-half inch on either side of the weld was examinated. In the area of component integrity specific attributes looked for were proper installation, configuration or modification of supports, evidence of mechanical or structural damage, corrosion and bent, missing or broken members.

Results

Welding and surface conditions were satisfactory, no violations were identified.

Liquid Penetrant Examination (57060)

Forty safety related pipe weldments and adjacent base material (1/2 inch on either side of the weld) were examined using the visible

dye, solvent removable method per NRC procedure NDE-9, Rev. 0, in conjunction with the licensee's procedure QCI-3.12, Rev. 4. Included in this sample were ASME class 1 and 2 pipe weldments selected from the Safety Injection (SI) and Chemical Volume Control (CS).

Results

Welding and surface conditions were satisfactory, no violations were identified.

Ultrasonic Examination (57080)

Six safety related pipe weldments were ultrasonically examined using a Sonic Mark 1 ultrasonic flaw detector.

These examinations were performed in accordance with NRC procedure NDE-1, Rev. 0 and associated site drawings, procedures and ultrasonic test data reports. The instrument calibration (vertical and amplitude linearity) was performed per NRC procedure NDE-2, Rev. 0. A distance amplitude correction curve (DAC) was constructed using the licensee's calibration blocks, TBX-9 and TBX-5. To ensure repeatability of the ultrasonic examination, the instrument setting and search unit (transducer) were matched as near as possible to those indicated by the licensee's ultrasonic data reports.

Results

An ultrasonic examination of weld 7, TBX-2-2523; in the safety injection system revealed an indication which was greater than 50% of the DAC. In accordance with the ASME Boiler and Pressure Vessel Code, Section XI, 1980 Edition, paragraph IWA 2232(b)(c) for examination of welds, reflectors that produce a response greater than 50% of the reference level shall be recorded. The reflector that was identified by the NRC was confirmed by the utility as being over 50% of DAC. However, the PSI Ultrasonic data report did not show this reportable reflector. As discussed in Section 3.0, further investigation by the inspector revealed that this deficiency was the result of an improper procedure.

Erosion/Corrosion Examination (57080)

Seven grid locations were selected for independent erosion/corrosion examinations by the NRC inspectors. Included in this examination were piping from the Condensate (Co) and Feedwater (FW) systems (grid numbers CO03, CO10, CO13, CO14, CO16, FW13, and FW29). A Nova D-100 digital thickness gauge was used to acquire the data in accordance with NRC procedure NDE-11, Rev. 0 and the Comanche Peak "Corrosion Monitoring Plan." The software for data storage and analysis was also reviewed during this inspection.

Results

The NRC acquired data showed no discernible difference from the data taken by technicians from Comanche Peak. The grids were marked on components in a way to ensure repeatable data collection. The data storage and analysis software is developed to engineering in identifying minimum wall violations and help establish erosion/corrosion wear rates in the future.

Service Water Erosion/Corrosion Unit 1 (92701)

The inspectors performed a follow-up inspection on the previously identified problem of sandblast coating removal, corrosion and remote visual inspection of the 10" piping of the Unit 1 service water system. NRC inspection reports 88-47, 88-48 and 89-44 and Texas Utilities Engineering Report ER-ME-19, dated September 21, 1988 were reviewed. These reports documented the licensee's corrective actions to assure that minimum wall thickness requirements were satisfied for the service water piping. These actions included replacement of some spool pieces and additional inspections. Also, as discussed below, the procedures for removal of coating and visual examinations were modified for Unit 2 to avoid the type of problems that occurred at Unit 1. The inspector had no further concerns regarding this issue and considers the Service Water 10" piping issue closed for Unit 1.

Service Water Erosion/Corrosion Unit 2 (92701)

During this inspection, the licensee was performing removal of coatings by sandblasting and remote visual examinations of the Unit 2 Service Water piping system. Several procedures dealing with these operations (included in Attachment 3) were reviewed by the inspectors and found to be acceptable.

3.0 Review of Site NDE Procedures and Manuals (57050)(57070)

The procedures listed in Attachment 3 were reviewed in the regional office during this inspection period for compliance to the licensee's FSAR commitments and applicable codes, standards and specifications.

Results

Westinghouse procedure, Manual Ultrasonic Examination of Welds Section 7.0, reads in part that valid flaw indications which provide a response equal to or greater than 50% of primary DAC shall be considered a recordable indication. Section 6.0 of the procedure, interprets valid indications to be reflectors cause by flaws, such as cracks, lack of penetration or fusion, inclusions and porosity. This is not in accordance with ASME Code Section XI, 1980 Edition which in part reads, all reflectors that produce a response of 50% or greater shall be recorded. This procedural deficiency is a violation of 10CFR 50, Appendix B, Criterion IX (50-445/89-38-04). As indicated in Section 2.1 of this report, independent NRC inspection identified a Code recordable indication that was not recorded because of this procedural deficiency.

4.0 Preservice Inspection (PSI) Program (73055) (73051) (73053)(73052)

The Comanche Peak Unit 1 preservice inspection has been completed. Comanche Peak's program was prepared and implemented by Westinghouse. The PSI program incorporates the requirements of the ASME Boiler and Pressure Vessel Code, Section XI 1980 supplemented by additional requirements of USNRC Reg. Guide 1.150. The licensee has requested relief from specific ASME Code requirements applicable to this program, which they feel are impractical. Such requests with technical justification for relief have been submitted to the NRC for review and approval.

Reviews

The inspector reviewed the following to ascertain compliance with applicable ASME code requirements, license commitments, and regulatory requirements.

- The preservice inspection program
- Personnel certification records for qualification of PSI contractor personnel
- PSI examination data reports
- NDE procedures
- FSAR

In addition, the inspectors witnessed a liquid penetrant PSI examination reperformed by the licensee. The NRC inspectors reperformed visual, liquid penetrant and ultrasonic examinations on a selected sample of welds.

Listed below are concerns that were identified during these inspections.

- The volume of weld examined by the licensee was not adequately documented (no plots existed to assure proper ultrasonic coverage, only estimated percentages were provided on final NDE reports).
- Examination limitations were not properly documented.
- Ultrasonic examination reports of record did not have dispositions as to the acceptability of examination results.
- Improper documentation of reflectors greater than 50% of DAC.

Results

Because of deficiencies in the documentation of preservice ultrasonic examination data the licensee's PSI program has not provided a good baseline for future inservice inspections (ISI). The lack of good documentation will complicate the evaluation of ISI data. The licensee should ensure that data taken during ISI are adequate to provide a good baseline for future examination. This item is unresolved pending licensee action and NRC review (Unresolved Item 50-445/89-38-01).

PSI Calibration Blocks

The licensee does not have as-built drawings of the site preservice inspection calibration blocks. There are approximately 44 calibration blocks. Because of the lack of as-built drawings it could not be verified that the blocks satisfy the 1980 ASME Section XI PSI requirements or the 1986 ASME Section XI requirements applicable to future inservice inspections. This item is considered unresolved pending licensee action to verify acceptability of the calibration blocks (Unresolved item 50-445/89-38-02).

PSI Procedure OPS-NSD-101, Rev. 5 dated April 8, 1975

Forms used during the PSI examinations were different than the ones contained in the procedure and the explanation in the procedure of what information needs to be included on the forms was inadequate for the ultrasonic data taken during the PSI. This issue is unresolved pending licensee action and NRC review (Unresolved Item 50-445/89-38-03).

PSI Reactor Vessel Nozzle Inner Radius (73055)

During the review of PSI data two concerns were identified regarding the reactor vessel nozzle inner radius preservice inspections.

1. The inspector discussed the rationale for performing manual ultrasonic examinations from the inner surfaces of the reactor vessel nozzles, when radiological conditions will prohibit manual examination during inservice. It was determined that during the PSI, the automatic equipment was unable to perform the maneuvers required to completely examine the nozzle inner radius and manual examination was needed as a supplement. Since that time the capability of the automatic equipment to provide the required examination coverage has been developed and a completely automated preservice exam has been completed.

2. There was no evidence of the required approvals for PSI procedure ISI-155, Manual Ultrasonic Examination of Nozzle Inner Radius, by the authorized inspection agency nor the licensee. Documentation was found that indicated the procedure had received a review. To supplement this the licensee is resubmitting ISI-155, Rev. 0 procedure to the authorized Nuclear Inservice Inspector and the licensee's NDE Level III for review in order to have evidence of proper reviews of acceptability.

Result

The inspector has no further concern and considers these subjects closed.

5.0 Electrical Penetrations (92706)

The licensee identified by deficiency report DR-C-88-02376, dated October 25, 1988, that the electrical penetrations (full penetration weldments) did not have the ASME code required radiography examination performed during the construction phase. The containment structural integrity test had been performed and fuel load was scheduled in approximately 70 days at the time of this report. The Comanche Peaks Unit 1 FSAR requires that the 77 electrical penetrations meet ASME Boiler and Pressurize Vessel Code, Section III, Division I, Subsection NE, 1971 through and including the 1973 Summer addenda for the full penetration Class II welds. In addition, Gibbs and Hill's Specification 2323-SS-14, Rev. 4 requires these electrical penetrations to be fully examined in accordance with the examination methods of NE-5120 of Section III of the ASME Boiler and Pressure Vessel code.

The inspector reviewed the actions taken by the licensee to resolve this nonconformance. The licensee stated that they had performed a stress analysis of the subject penetrations and that a change to the FSAR to eliminate the code required volumetric examination of the welds planned to be submitted to the NRC. The inspector performed a walkdown of the electrical penetrations and concluded that radiography was not suitable at this time, however, the code required volumetric examination of the penetrations could be met by performing ultrasonic examination. Stress analysis is not a substitute for the performance of nondestructive testing that is intended to verify the acceptable quality of fabricated components. It was evident that adequate engineering corrective action had not taken place and the disposition was inadequate. This is a violation of NRC requirements (50-445/88-28-06).

At the conclusion of this inspection, the licensee was preparing to perform ultrasonic examinations of the electrical penetrations.

6.0 Fuel Transfer Tube Penetration Sleeve Weldments (92706)(57090)

The licensee identified in deficiency report DRC-88-02376, dated October 25, 1988, that the fuel transfer tube penetration sleeve did not have the ASME Section III code required radiography examinations for the full penetration Class II weldments (1A, 1B, 2A and 2B). DRC-88-02376 required the fuel transfer tube weldments to be radiographed. Nonconfirmance report number 89-04023, Rev. 1, dated April 4, 1989, was initiated and these welds were radiographed on June 3, 1989 and rejected for gross welding defects in accordance with site radiographic procedure AQP-10.4.

NRC review of this deficiency revealed the following:

- DCA-6500 issued March 19, 1980 did not incorporate on the DCA drawing the required engineering design (weld symbol) for the required full penetration weldments. This DCA also did not contain the NDE requirements for 100% radiography for these weldments. The requirements for

full penetration welds and for 100% radiography were established in FSAR Section 3.8.1.2.3, through reference to the ASME Boiler and Pressure Vessel Code, Section III, Division I, Subsection NE, 1971 through and including the 1973 Summer Addenda. Gibbs and Hill's site specification for containment Steel Liner 2323-SS-14, Section 10.2.3 also specified the requirement for full penetration welds and 100% radiographic inspection.

- The control, verification and site quality requirements for this Field Design change were not in accordance with site procedures CP-EP-4.6, CP-EP-4.5 and CP-EP-4.0.

- These deviations were not promptly identified.

- The disposition of NCR-89-04023, Rev. 1 accepted "as-is" the Class III weldments (1A, 1B, 2A and 2B) with rejectable radiographic indications. This is not an appropriate in that an adequate corrective action is to repair the radiographic rejected areas in accordance with ASME Section III requirements and post-repair magnetic particle examinations and radiography in accordance with ASME Section III, NB-5120 and as required by site specification 2323-SS-14. This is a violation of NRC requirements (50-445/89-38-05).

7.0 Attachments

Attachment No. 1 is a tabulation of specific pipe weldments and components examined. Attachment No. 2 is a tabulation of specific hanger/supports examined. Attachment 3 is a list of the NDE procedures reviewed.

8.0 Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items or violations. Three unresolved items appear in paragraph 4.0.

9.0 Management Meetings (30703)

Licensee management was informed of the scope and purpose of the inspection at the entrance interview on July 5, 1989. The findings of the inspection were discussed with the licensee representatives during the course of the inspection and presented to licensee management at the exit interview (see paragraph 1.0 for attendees).

At no time during the inspection was written material provided to the licensee by the inspector. The licensee did not indicate that proprietary information was involved within the scope of this inspection.

[redacted] INDEPENDENT MEASUREMENTS INSPECTION SHT 1 OF 2

[redacted] COMANCHE PEAK DATE: 7/17-7/28/89

ISO\DWG	WELD	SYSTEM	CL	RT	PT	UT	VT	ACC	REJ	COMMENTS
CS-1-RB-31B	20W	CS	1		X		X	X		CHEM. VOL. CONTROL (CS)
CS-1-RB-31B	3BW	CS	1		X		X	X		
CS-1-RB-31B	4BW	CS	1		X		X	X		
CS-1-RB-31B	5BW	CS	1		X		X	X		
CS-1-RB-31B	6BW	CS	1		X		X	X		
CS-1-RB-31B	7	CS	1		X		X	X		
CS-1-RB-31B	8	CS	1		X		X	X		
CS-1-RB-31B	9	CS	1		X		X	X		
CS-1-RB-31B	10	CS	1		X		X	X		
CS-1-RB-31B	11	CS	1		X		X	X		
CS-1-RB-31B	12	CS	1		X		X	X		
CS-1-RB-31B	13	CS	1		X		X	X		
SI-1-RB-006	5	SI	1		X	X	X	X		SAFETY INJECTION
SI-1-RB-006	6	SI	1		X	X	X	X		
SI-1-RB-006	9	SI	1		X		X	X		
SI-1-RB-013	10	SI	1		X		X	X		
SI-1-RB-013	11	SI	1		X		X	X		
SI-1-RB-013	12	SI	1		X		X	X		
SI-1-RB-013	13	SI	1		X		X	X		
SI-1-RB-013	14	SI	1		X		X	X		
SI-1-RB-013	15	SI	1		X		X	X		
SI-1-RB-015	16	SI	1		X		X	X		
SI-1-RB-015	17SW	SI	1		X		X	X		
SI-1-RB-015	18SW	SI	1		X		X	X		
SI-1-RB-015	19	SI	1		X		X	X		
SI-1-RB-015	20	SI	1		X		X	X		
SI-1-RB-015	21	SI	1		X		X	X		
SI-1-RB-015	22SW	SI	1		X		X	X		

ATTACHMENT #2 - INSERVICE MEASUREMENTS INSPECTION — SHT 2 OF 2

SITE: COMANCHE PEAK — DATE: 7/17-7/28/89

ISO DWG	WELD	SYSTEM	CL	RI	PT	UT	VT	ALC	REJ	COMMENTS
SI-1-RB-015	23SW	SI	1		X		X	X		SAFETY INJECTION
SI-1-RB-015	24	SI	1		X		X	X		
SI-1-RB-015	25	SI	1		X		X	X		
SI-1-RB-015	26SW	SI	1		X		X	X		
SI-1-RB-015	27SW	SI	1		X		X	X		
SI-1-RB-015	28SW	SI	1		X		X	X		
SI-1-RB-37	1 DM	SI	2		X		X	X		ACCUMULATOR DISCHARGE
SI-1-RB-37	2	SI	2		X		X	X		
SI-1-RB-37	6	SI	2			X	X	X		AXIAL SCAN ONLY UT
SI-1-RB-37	7	SI	2			X	X	X		AXIAL SCAN ONLY UT
SI-1-RB-39	1 DM	SI	2		X		X	X		
SI-1-RB-39	2	SI	2		X		X	X		
SI-1-RB-39	6	SI	2		X	X	X	X		AXIAL SCAN ONLY UT
SI-1-RB-37	7	SI	2		X	X	X	X		AXIAL SCAN ONLY UT

ATTACHMENT 02 INDEPENDENT MEASUREMENTS INSPECTION SHT 1 OF 2
SITE: COMANCHE PEAK HANGER/SUPPORT INSPECTION DATE: 7/17-7/28/87

DWG NO	HANGER/SUPPORT	SYSTEM	CLASS	ACC	REJ	COMMENTS
SI-1-SB-15	SI-1-039-016-S22R	SI	2	X		SAFETY INJECT.
SI-1-SB-15	SI-1-039-017-S22R	SI	2	X		
SI-1-SB-15	SI-1-039-018-S22R	SI	2	X		
SI-1-SB-15	SI-1-039-019-S22R	SI	2	X		
SI-1-SB-15	SI-1-039-020-S22R	SI	2	X		
SI-1-SB-15	SI-1-039-021-S22R	SI	2	X		
SI-1-SB-15	SI-1-039-022-S22R	SI	2	X		
SI-1-SB-23	H-SI-1-023B-001-2	SI	2	X		GHH
SI-1-SB-23	H-SI-1-023B-002-2	SI	2	X		GHH
SI-1-SB-23	H-SI-1-023B-003-2	SI	2	X		GHH
SI-1-SB-23	H-SI-1-023B-004-2	SI	2	X		GHH
SI-1-SB-23	H-SI-1-023B-005-2	SI	2	X		GHH
RC-1-RB-06	RC-1-069-001-C41R	RC	1	X		REACT. COOLANT
RC-1-RB-06	RC-1-069-002-C41R	RC	1	X		
RH-1-RB-02	RH-1-002-001-C41S	RH	1	X		RESIDUAL HT.
RH-1-RB-02	RH-1-002-004-C41S	RH	1	X		
RH-1-RB-02	RH-1-002-009-C41K	RH	1	X		
RH-1-RB-02	RH-1-002-010-C41S	RH	1	X		
RH-1-RB-02	RH-1-002-011-C41S	RH	1	X		
RH-1-RB-02	RH-1-002-012-C41K	RH	1	X		
RH-1-RB-02	RH-1-002-013-C41R	RH	1	X		
RH-1-RB-02	RH-1-002-014-C41K	RH	1	X		
RH-1-RB-01	RH-1-001-001-C41S	RH	1	X		
RH-1-RB-01	RH-1-001-004-C41S	RH	1	X		SAFETY INJECT.
RH-1-RB-01	RH-1-001-007-C41K	RH	1	X		
RH-1-RB-01	RH-1-001-008-C41K	RH	1	X		
RH-1-RB-01	RH-1-001-011-C41S	RH	1	X		
RH-1-RB-01	RH-1-001-012-C41S	RH	1	X		

SITE: COMANCHE PEAK HANGER/SUPPORT INSPECTION DATE: 7/17-7/28/89

DWG/ISO	HANGER/SUPPORT	SYSTEM	CLASS	ACC	REJ	COMMENTS
SI-1-RC-[illegible]	SI-1-026-710-C41R	SI	1	X		SAFETY INJECT.
SI-1-RB-[illegible]	SI-1-026-710-C41R	SI	1	X		
SI-1-RB-[illegible]	SI-1-026-711-C41R	SI	1	X		
SI-1-RB-[illegible]	SI-1-026-712-C41R	SI	1	X		
SI-1-RB-24	SI-1-026-715-C41R	SI	1	X		
SI-1-RB-24	SI-1-026-718-C41R	SI	1	X		
SI-1-RB-24	SI-1-026-721-C41R	SI	1	X		
SI-1-RB-24	SI-1-026-723-C41R	SI	1	X		
SI-1-RB-24	SI-1-026-723-C41R	SI	1	X		
RC-1-RB-10	RC-1-015-700-C41K	RC	1	X		REACTOR COOL.
RC-1-RB-10	RC-1-015-702-C41S	RC	1	X		
RC-1-RB-10	RC-1-015-703-C41K	RC	1	X		
RC-1-RB-10	RC-1-015-705-C41K	RC	1	X		
RC-1-RB-10	RC-1-015-706-C41R	RC	1	X		
RC-1-RB-10	RC-1-016-700-C41K	RC	1	X		
RC-1-RB-10	RC-1-016-704-C41S	RC	1	X		
RC-1-RB-10	RC-1-016-705-C41R	RC	1	X		
CS-1-RB-09	CS-1-161-700-C41S	CS	1	X		CHEM. VOL. CRT.
CS-1-RB-09	CS-1-161-701-C41S	CS	1	X		
CS-1-RB-09	CS-1-161-702-C41K	CS	1	X		
CS-1-RB-09	CS-1-162-700-C42K	CS	2	X		
CS-1-RB-09	CS-1-162-704-C42K	CS	2	X		
CS-1-RB-09	CS-1-162-705-C42S	CS	2	X		
SI-1-SB-25	SI-1-039-011-S22R	SI	2	X		SAFETY INJECT.
SI-1-SB-15	SI-1-039-002-S22R	SI	2	X		
SI-1-SB-15	SI-1-039-012-S22R	SI	2	X		
SI-1-SB-15	SI-1-039-013-S22R	SI	2	X		
SI-1-SB-15	SI-1-039-015-S22R	SI	2	X		

ATTACHMENT 3

Westinghouse Nuclear Services Division (NDIS)

Procedure Title	Number/Revision
Westinghouse	
Preservice and Inservice Examination Documentation	INT-ISI-101, Rev 0
Magnetic Particle Examination	INT-ISI-70, Rev 0
Liquid Penetrant Examination	INT-ISI-11, Rev 0
Visual Examination	INT-ISI-8, Rev 0
Manual Ultrasonic Examination of Welds in Vessels	INT-ISI-47, Rev 0
Manual Ultrasonic Examination of Welds	INT-ISI-206, Rev 0
Reactor Vessel Inspection Program Preparation and Documentation	RV-ISI-01, Rev 1
Preservice Inspection Reactor Vessel	ISI-154, Rev 1
Manual VT Examination of Reactor Nozzle Inner Radius	ISI-155, Rev 0
Manual VT Examination of Full Penetration Circumferential and Longitudinal Butt Welds	ISI-205, Rev 2
Magnetic Particles	ISI-70, Rev 2
Texas Utilities Generating Company (TUGCO)	
Corrosion Monitoring Program Ultrasonic Measurements	NQA 3.09-8.47, Rev 0
Visual Examination	VE-1, Rev 1
Radiography	RT-ANSI-B31.1, Rev 0
Coating Removal of 10" Piping	QCP-2, Rev 0
Quality Personnel for Abrasive Blast Removal	DCA 88609, Rev 2
Remote Visual of 10" Piping After Plastic Removal	2 PPT-40.9
Remote Visual of 10" Piping Prior to Plastic Removal	2 PPT-40.8
Design Verification	CP-EP-4.5
Field Design Change Control Procedure	CP-EP-4.6
Design Central General	CP-EP-4.0

Procedure Title	Number/Revision
Oliver B. Cannon	
Coating Removal by Abrasive Blasting	CSPVL339 (QCP-1, Rev 2
Brown and Root	
Remote Visual Examination	AQP-10.11
Radiographic Examination	AQP-10.4
Stone and Webster Engineering	
Qualification for Remote Spin Blast for 10" Piping	SW-TP-ME-03, Rev 1
Qualification for Handheld Blast for 24" and 30" Piping	SW-TP-ME-02, Rev 1
Gibbs and Hill	
Design Specification for Containment Steel Liner	2323-SS-14