UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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JUL 17 1985

MEMORANDUM FOR: Vincent S. Noonan, Director
Comanche Peak Project

FROM: Chet Poslusny, Program Coordinator
Comanche Peak Project

SUBJECT: FEEDBACK INTERVIEW OF WITNESS A-44

On November 7, 1984, the TRT conducted a feedback interview with allegers A-44 and A-73 at a meeting at Fort Worth, Texas. The purpose of this meeting was to discuss the TRT evaluation and conclusions concerning these allegations which are in the mechanical/piping, quality assurance/quality control, civil/structural, and miscellaneous areas.

The TRT Attendees were as follows: J. Zudans, V. Noonan, A. Vietti, R. Philleo, L. Shao, J. Calvo, R. Keimig, W. Smith, D. Hunnicutt, and R. Bangart.

The following is a summary of each addressed allegation and alleger's comments on each.

1. AC-52--It was alleged that several field-cured and standard-cured cylinders failed specification requirements and that Schmidt Rebound Hammer Test was then misapplied to resolve these failures. The TRT found that some procedures were violated and subsequently the Schmidt Hammer Test was correctly applied. The "low strength" cylinders were, in all cases, taken from pours where 2500 psi strength concrete was specified.

2. AC-66-- It was alleged that there were cracks in the concrete base mat on Unit One. The TRT determined the cracks had no structural significance. The original alleger had been contacted, and he was satisfied with the TRT's findings. A-44 was concerned that the crack location and size had never been documented and the documentation may have been falsified. The pour cards and compressive strength tests were missing.

   A-44 stated she had heard Unit 2 used a revised procedure because of Unit 1 problems; it was poured on a weekend to avoid problems with the inspectors. Philleo stated cracks are anticipated in that location, and the steel is designed to carry the load. The pour was made on a weekend, with a large complement of inspectors and crafts people. Also, the contractor had the option of making one or two pours and chose to make only one.

3. AE-17--It was alleged that field run conduit, drywall, and lighting installed above the control room were classified nonseismic and inadequately supported. The TRT found Seismic Category Two equipment (nonsafety conduits and lighting fixtures) requires analysis to show failure would not affect the component. Construction is replacing the

ceiling. A-44 stated the construction was started without reviewing the results of the reanalysis or getting NRC's approval, which puts on added burden on the NRC.

4. AM-22--It was alleged that TUEC has not analyzed the HVAC supports for seismic loads. HVAC failure might lead to unacceptably high temperatures inside the containment. The TRT found all HVAC supports had been analyzed for

seismic loading. Also, the containment heat removal system was designed so no single failure of an active component could prevent the system from accomplishing its design safety function. A-44 asked if the ducts up the side of the containment were seismically supported. The TRT will investigate.

5. AE-13--It was alleged that terminal lugs of improper size had been used in certain panels and improper cable splices existed in various panels. The TRT found the panel referred to was not a safety related system, and the terminal lugs and cable splices were acceptable for that system.

6. AT-1--It was alleged that the Hot Functional Test was deficient in that major components and equipment were not installed at the time of testing. The TRT found missing components and equipment were identified and reported as deficiencies in the test, and future tests were planned which would check out that equipment.

7. AT-2--It was alleged that significant equipment modifications have been made or planned which invalidate the Hot Functional Test. The TRT found that outstanding testing which remained because components were not installed at the time of the test was tracked by the applicant's tracking system and future tests were planned to test these components.

8. AT-3--It was alleged that TUEC does not intend to confirm performance of major components and equipment until after fuel loading. The TRT found TUEC had planned preoperational testing after fuel loading to pick up items omitted from the Hot Functional Tests. Those items which were deferred could not cause a radioactive release if done after fuel loading. However, since fuel loading was deferred, additional Hot Functional Testing will be performed in the interim.

9. AT-4--It was alleged that neither Region IV nor TUEC noticed major components and equipment were not installed prior to the Hot Functional Test. The TRT found TUEC had an adequate tracking system which covered these items, and Region IV was monitoring that tracking system.

10. AT-5--It was alleged that the Hot Functional test was flawed because it did not include accident conditions. The TRT found the safety systems were indeed tested as far as possible, but NRC does not require tests under actual accident conditions.

11. AT-6--It was alleged that both the Applicant and Region IV were willing to accept Hot Functional Tests which were deficient and could not be relied on to prove that CPSES is safe. The TRT found no deficient test results were accepted by the Applicant. Three minor cases were found where test objectives were not completely met. These will be retested.

12. AT-7--It was alleged that problems revealed by the Hot Functional Test and related containment leak rate tests are so extensive and such magnitude that they must be corrected before fuel load. The TRT found four leak rate tests were done before an acceptable test was accomplished.

13. AT-10--It was alleged that the ASLB should closely monitor successful completion of tests and reinspections. The TRT found nothing to report to the ASLB as far as testing deficiencies, component and equipment deficiencies, and safety issues are concerned.

14. AT-11--It was alleged that the ASLB should recognize test result evaluations by the TUEC and are NRC are incompleted and inaccurate. The TRT found no lack of candor on the part of TUEC or NRC. A-44 asked where the NRC was when tests and retests are being done. Region IV covers all testing on a random basis 24 hours a day. They have no needed to call in extra help.

15. AT-12--It was alleged that separate tests should be required for Unit 2, rather than relying on tests performed on Unit 1 to reveal problems. The TRT found that only systems which are shared by Units 1 and 2 and that were fully tested during the Unit 1 test program are not scheduled for retesting during Unit 2's preoperational test program. All other Unit 2 systems will be tested separately.

16. AT-17--It was alleged that there were numerous problems with the Thermal Expansion Test. The TRT found approximately 50% of the monitored locations still require measurements. Also, it was alleged traceability of measurement systems was not maintained. The TRT found this was correct, but traceability was possible through a test engineer's log. Further testing is planned and a better correlation between predicted pipe movement and measured pipe movement is anticipated. A-73 stated that the utility is relying too heavily on the as-built system, as opposed to relying on CMC's (component modification cards), and that the unexpected pipe movements were caused by binding snubbers and piping which was prestressed by using hydraulic jacks, cranes, etc, to forge fitup.

17. AE-55--It was alleged that four safety related class 1E meters were removed from the main control panel, sent off site for modification, and reinstalled without procedure. The TRT will review this allegation.

18. AE-56--It was alleged that a wire of a smaller size than specified was used in one case. A-44 will furnish more detail to J. Calvo.

19. AC-67--It was alleged that the concrete was not retested on the concrete pour for the Reactor No. 2 cavity wall. Mr. Philleo stated this may be a QA/QC matter, but the actual strength is more than adequate for the applications.

20. AC-72--There was concern that where the 2500 psi concrete mixes were used instead of the 4000 psi mixes, the analysis used the 2500 psi characteristics. Most, if not all, of the 2500 psi concrete was used in nonstructural locations. However, the TRT will investigate this concern further.

21. AC-71--There was concern that the TRT may not be able to determine where the 2500 psi concrete was used. The TRT will investigate.

22. AC-68--There was concern that Schmidt Hammer Tests were misinterpreted in determining the concrete strength. A-73 and Philleo agree on how the test can be used. Philleo had not seen any applications where the test was misinterpreted.

23. AE-17--It was alleged that field run conduit, drywall, and lighting installed above the control room panels were classified as nonseismic and were inadequately supported. The TRT agreed the allegation is valid. The additional calculations required to show the supports are seismically sound have been done, but the TRT is still studying the problem.

24. AC-69--There was concern that in analyzing field run conduit, the consequences of a Category 2 failure on adjacent Category 1 equipment may not have been considered. The TRT will study this further.

25. AC-70--Alleger A-73 was concerned that the designer had not used the 1.5 factor when performing equivalent static load calculations. The TRT will investigate.

26. AC-79--There was concern that in calculating allowable stresses for the containment building cable tray supports; the Applicant used allowable stresses for the auxiliary building, which are above the yield strength of the steel used in the building. The containment building allowables are not permitted to exceed the yield strength of the steel used in the building. The TRT will investigate.

27. AC-78--There was concern that in connecting the cable tray to the cable tray supports, holes were drilled through the flanges of the channels, which weakens the supports. This may not have been considered in analyzing the support. The TRT will investigate.

28. AC-80--There was concern that an incorrect dye penetrant test was made on a stainless steel liner in the reactor building and fuel building. Also, MPSI had attached a horizontal plate to the liner to attach a support; A-73 calculated it was overstressed. The TRT will investigate to assure design calculations on the support system were properly performed.

29. AC-82--There was concern that the location of liner plate weld seams do not match the drawing locations around the Unit 1 reactor building. The TRT will investigate.

    Noonan stated [redacted] were not able to attend this meeting, but Noonan would relay A-73's comments to them.

30. AC-75--There was concern that no gap was provided at the doorway between the containment and the safeguards building. This would affect the seismic analysis. The TRT was aware of this and will investigate.

31. AP-42--A-73 alleges that an NCR had been revised four times, that the violations had been removed improperly, and that 10CFR50.55(e) had been violated. The TRT will investigate.

32. AC-64--There was concern that a tie-in may exist between the basemat crack and other deficiencies. A-44 requested a study be made as to whether the basemat crack runs under the reactor. Philleo said it undoubtedly did, but was of no consequence structurally.

33. AC-65--There was concern that cracking of the floor slab concrete was not investigated thoroughly enough Some cases of honeycomb and internal voids may exist. A-44 was concerned with the amount and variety of defects in the concrete. The TRT will investigate the repair of honeycombs and voids.

34. AC-63--There was concern that, in some cases, honeycomb and internal voids in the concrete may exist. A-44 was concerned with the amount and variety of defects in the concrete. The TRT will investigate the repair of honeycombs and voids.

35. AP-29 and AP-44--It was alleged that minimum wall thickness violations occurred. A-44 requested an update on the status of various concerns about violations of minimum thickness.

36. AP-43--It was alleged that supports upgraded from Class 2 to Class 1 do not meet all the requirements of Class 1. A-44 is concerned whether the calculations were also upgraded where the supports were upgraded from Class 2 to Class 1.

37. AP-41--It was alleged that frame jacks were used to maintain gap size in some hangers. A-44 states use of power tools to force pipe into place should be prohibited.

Conclusion: A-44 stated that the feedback meeting is an effective way to communicate the results of the TRT's investigation of issues to the allegers. V. Noonan stated that a similar meeting is planned on QA/QC allegations.

C. Poslusny

C. Poslusny, Program Coordinator
Comanche Peak Project

cc: D. Eisenhut
B. Hayes
J. Youngblood
L. Shao
J. Calvo
[redacted]
Docket Files 50-445/446

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M. Kline
Docket Files 50-445/446

OFC	:CPP	:CPP	:	:	:	:	:
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7-17-85 MEK
OFFICIAL RECORD COPY

ed by (X)
established in the.

NCR M-1802 0
P2-26 of 28

k Record

~~1~~	~~1 1/2"x1' 7" Carbon Steel Plate (SA 515 GR 65 or SA 36) 1' 7" Long, TW=107#~~ CMC 7401R.1	~~2~~			x		x			
2	6"x6"x1/2" Structural Tubing (A-500 GR B) 3'-6" Long, TW=241#	2	LWM	11/1/79		x	x			
3	M4x13 (SA-36) 2'-0 1/8" Long, TW=52#	2	LWM	11/1/79		x	x			
~~4~~	~~1 1/4"x12" Super Hilti Kwik Concrete Anchors (1144)~~ CMC 7401	~~8~~					x			
X	ALL MATERIAL BY FIELD									
	SEISMIC ASSEMBLY SKETCH AND ENGINEERING	1								
	BUNDLE AND TAG	1								
	MARK # SW-1-010-004-A33R									
	Apply one coat of Carbo Zinc #11 to above mat'l except th'ds which shall be coated w/a rust preventative.									
5	1¼" x 12" HILTI BOLTS	4								
~~6~~	~~1" x 1' x 3'-8" C.S. PL (SA 515 GR 65 OR SA 36)~~	~~1~~								
7	3/4" x 5" x 3' GUSSET PLATES (SA 515 GR 65 OR SA 36)	2	LWM	10/31/79						
~~8~~	~~B.P. ... ~~ per ABRF 00062									
8	Per ABRF 00062	1	LWM	9-25-79						
	item 8 per CMC 7401 R1 is same spacing as ABRF 00062									

FOR INFORMATION

Approved By: DCP
Date: 11/1/79

QUAN	SHIP		FOS	L	CSS	TRIM	SEC

FOR MATERIALS AND OPERATIONS SEE SKETCH NO. ______ SHEET ___ OF ___

Brown & Root, Inc.

CONDITIONS	Fx	Fy	Fz	Mx	My	Mz
DESIGN						
NORMAL & UPSET	±4743					
EMERGENCY	±5759					
FAULTED						

REF. DRAWING NUMBERS

PIPE: M1-0704 REV. 11 — ELECT: E1-0700-01 REV. 4
STEEL: S1-0700 REV. 11 — H.V.A.C.: M1-0752 REV. 5

REV	DATE	DWN	CHK	APP	DESCRIPTION
0				DM	ISSUE FOR CONST FIELD FAB FW 1-6

CUSTOMER Texas Utilities Service, Inc.
ORDER NO.
JOB NAME Comanche Peak 1 & 2
MARK NO. SW-1-010-004-A33R

FOIA-85-59

R153

...STEAM
...STATION (CPSES)

COMPONENT MODIFICATION CARD (CMC)

SERIAL NO. № 7401 Rev. 2

) APPLICATION: PIPE SUPPORT WELD MOD. ☑ Q ☑ NON-Q ☐ DESIGN CHANGE: YES ✓ NO ___

) DWG. NO. ITT REV. 0 B&R REV. 0
W-1-010-004-A33R

) LINE NO./COMPONENT NO.
N/A

(4) REASON FOR CHANGE: INTERFERENCE BETWEEN PIPE AND HILTI BOLTS, HILTI BOLTS CANNOT BE INSTALLED AS DESIGN UNDER 24" PIPE.
△1 ADDED WELD NO'S AND REVISED BASE PL.

(7) REQUESTED/PREPARED BY:
PETE MASON
NAME
Pipe Support Const.
DEPT.

) INSTRUCTIONS:

NCR M-1802 & P2.27 & P2.28

MOVE N/A

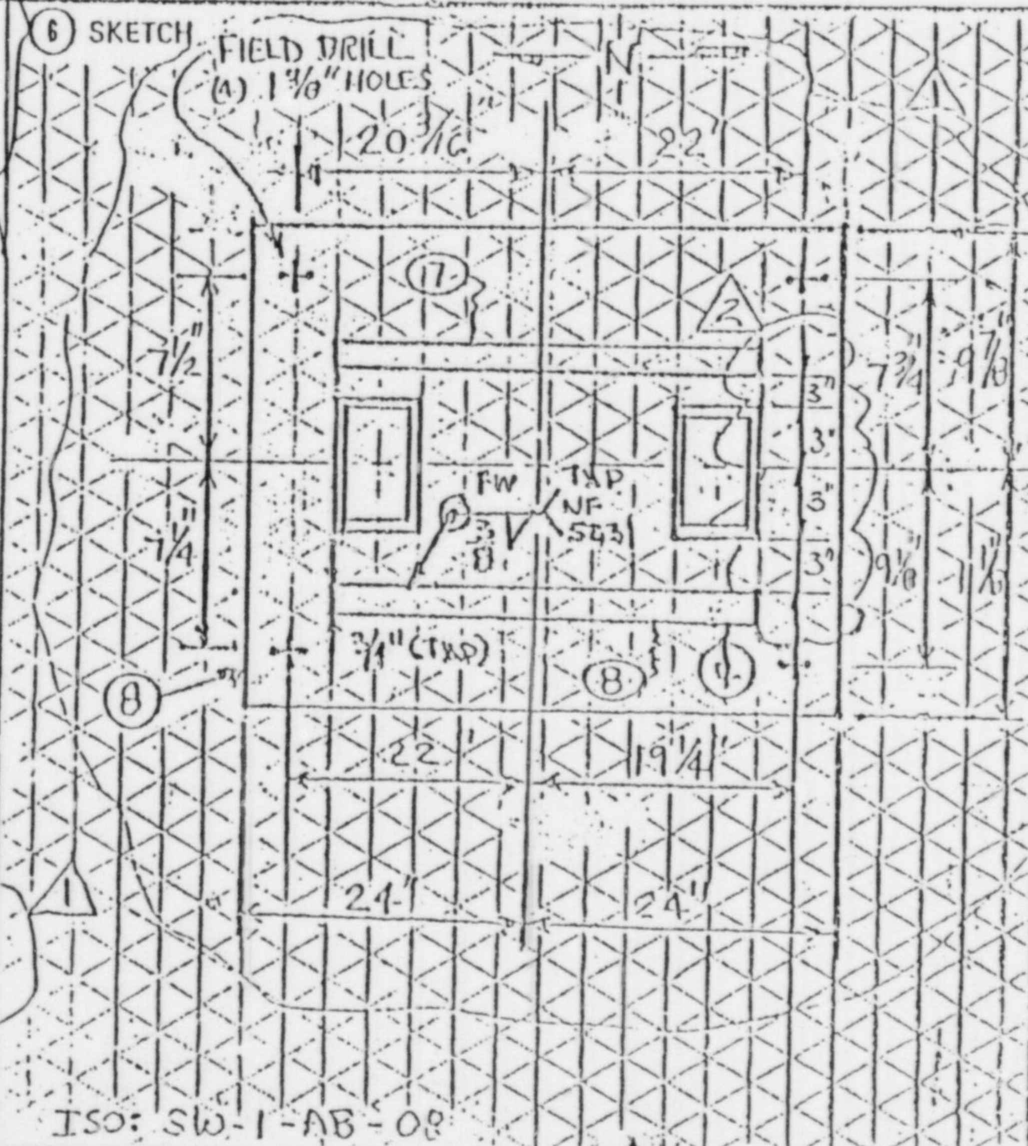
ITEM 4 DELETE
DELETE ITEM #1 (SCRAP)
DELETE ITEM #6 △1

) FW 718 △1

#5: 1¼" HILTI BOLTS X 12
... REQ. (4)

#8 1" X 1'-7" X 4'-0" Lg.
... PL (SA-515 Gr65 OR ...36) QTY. (1)
#7: ¾" X 5" X 3'-0" Lg.
... SET PLATES QUAN.(2)
SA-515 Gr65 OR SA-36.)

(6) SKETCH



ISO: SW-1-AB-08

(8) APPROVED BY: △1 EJ 9-26-...
... 5-12-...
DATE
GUS ABECE 6-22-79
DATE
△1 ITT
DATE
OCT 31 1979
DATE
DATE
DATE

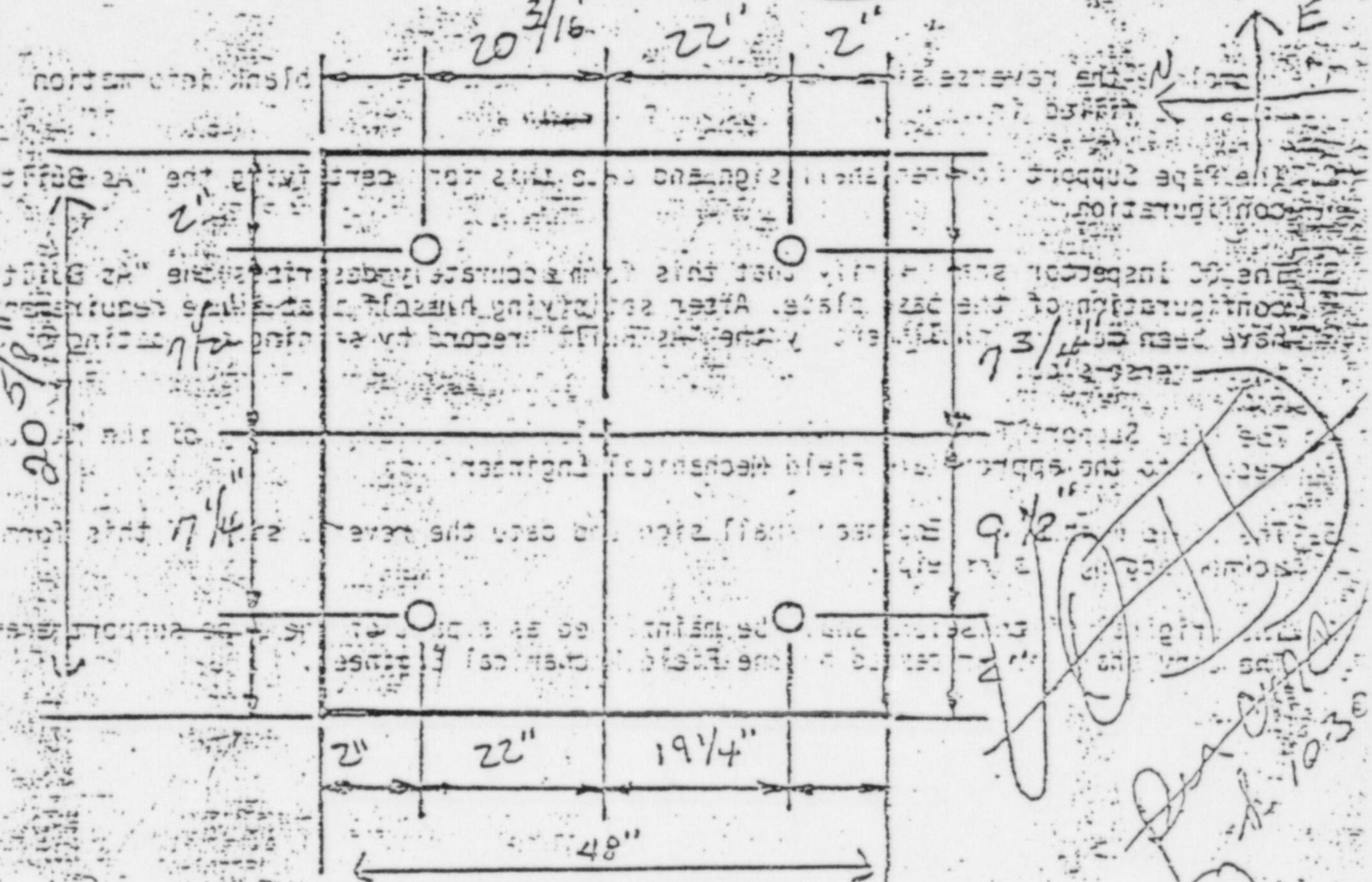
(11) DISTRIBUTION	DCC CNTL NO.	QTY.

ISSUED BY DCC

THIS REVISION VOIDS AND SUPERSEDES DOCUMENT SERIAL NO. CMC 7401 Rev. 1

NCR-M-1802 pg. 28 of 28 00362

"AS BUILT" RECORD FORM



1. Hanger Number SW-1-010-004-A33R Rev. 0
2. Indicate Plate Orientation on above sketch
3. Plate Material Carbon Steel (SA515 GR65 or SA36)
4. Plate Thickness 1"
5. Hilti Bolt Size ~~1" x 2"~~ 1 1/4" X 12" (B)
6. If hanger has more than one plate, indicate which plate is covered. Attach additional forms for other plates as required.

(C)

Pipe Support Foreman	Date
QC Inspector	Date
Field Mechanical Originator	Date

vision 0
'ember, 1979

FOR INFORMATION ONLY

NOTES REGARDING CASE EXHIBITS 498 AND 497, NCR M-1802 and M-1802 R1

Perhaps the most important change is the deletion (page 2) in Revision 1 of the following statement which was contained in the original NCR:

"SUMMARY:

"Exhibits I & II attached show loss of control and failure to conform to sections V and VIII of 10CFR50, Appendix B by both craft and Engineering personnel. The drawing control and design change controls as specified in site Procedures has been neglected such that both these documentation packages cannot support these applicable regulatory requirements."

A review of this NCR, CASE believes, demonstrates that the above-quoted statement was correct. In any event, the statement should have been left in, with whatever additional information or changes were desired, rather than its being deleted. Other questions: What was the reason for item 15, page 1 (Corrective Action Request) being changed from Required to Not Required? What was the reason for the Document Violated being changed to ASME Section III from 10CFR50 App. B Pt. V & VIII? What explanation (if any) was given to J. Patton, the originator of the NCR?

NOTE: The following are some miscellaneous notes which we typed up when we were first reviewing this NCR; we have not reviewed them with Mark Walsh for many months, but will do so if you would like to discuss this further.

Page 2:

I.C. What are actual dimensions of base plate (since nothing voided out). Why NPSI? Who is vendor?

I.D. 10 CFR App. B. According to Grinnell drawing, sheet 10 of 28 of TUSI's AF-1-001-007, sheet 1 of 2, they are vendor shop welds; if shop weld, why is NPSI involved if it is a Grinnell drawing?

Sheet 12 of 28, disposition. NPSI clamp -- Grinnell drawing??? Final As-Built Drawing: Brown & Root, NPSI, or Grinnell? (Believe it is Brown & Root.)

Only 8 welds indicated on drawing. Welds going to base plate have got to be field welds. At least 2 of them are field welds; and one that is not necessary.

I.G. Not shown anywhere. May not catch at as-built; may think it is already built and not go look at it again.

II.A. Not identical; dimensions 4" off. According to ASRF there is a difference in the dimensions between the bolts. Writer was right.

II.B. Problem was rewritten in Rev. 1 from what it was in the original NCR. Rev. 1 did not address the original problem; came up with a new problem. They are two different base plates. If these are already as-built drawings, something is wrong because they are not as-built correctly.

Page 18 of 28 (Rev. 1):

Reason for CMC is misfabrication by NPSI.

C/S

CREDIBILITY AND/OR COMPETENCE OF NRC STAFF WITNESSES (continued):

Mr. Taylor

Omission of Reinforcing Steel -- On pages VII - 21 through 23 of these Findings, there is a discussion regarding the omission of reinforcing steel. In addition to what is contained therein, the following should be noted. The following documents, all of which have been accepted into the record, are pertinent:

CASE Exhibit 364, NCR C-520 (especially pages 1, 35, 39, 40, 42-45) --
Large number of interior wall dowels in mat of Safeguard #2 out of tolerance; interior wall dowels mislocated and sufficient concrete cover cannot be obtained. 1/2" concrete cover for vertical wall bars is acceptable. "For horizontal wall bars a minimum clearance of 3/4" must be maintained." ". . . potential effects on the structure if each of the 45 dowels identified . . . were bent to bring them back into tolerance. These bars are so scattered that the bending would not impair the performance of the walls which they reinforce . . . " Discussion of calculated stresses.

Interoffice Memo (page 44): "In the past week, Construction has been reviewing the 5 instances in which reinforcing steel has been omitted in concrete pours. We feel this is a very serious concern and are taking all steps possible to eliminate this as soon as possible in the future . . ." Set up procedures to eliminate recurrence. (Emphases added.)
The NCR was dated 3/3/77; the memo was dated 11/4/77.

CASE Exhibit 479, NCR C-669 (especially pages 1-8) --
Approximate 112 - #9 reinforcing bars required were not installed prior to concrete placement #101-4812-001, made on 5/25/77. Disposition: Use as is. CAR (Corrective Action Report) not required.

Gibbs & Hill letter (page 4): ". . . a series of rebars had been omitted from the reactor cavity concrete between Elevations 812'-0" and 819'-0½". The missing rebars were located adjacent to the neutron detection slots and had been added only recently as a change in G&H drawings 2323-S1-0572, 2323-S1-0574 and 2323-S1-0575 . . . the omission of this additional reinforcement does not in any way impair the structural integrity of the reactor primary shield structure under any postulated loading condition. The additional rebar had been added by G&H as a precaution against cracking which might possibly occur in the vicinity of the neutron detector slots following a LOCA (loss-of-coolant accident). They provide a means of uniformly distributing accident loading stresses around the slots precluding the possibility of local cracking . . ."

As stated in our 10/18/82 pleading: CASE had not recognized the potential tie-in between this NCR and the crack in the Unit 1 base mat or radiation shield until we were doing this analysis; this was because this NCR dealt with the neutron detection slots and the NCR about the crack stated nothing about anything but the base mat. It was not until the testimony in the June (1982) hearings that the possibility was presented that the crack could be in the radiation shield. The G&H letter indicates that they were concerned about cracking in the area

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CREDIBILITY AND/OR COMPETENCE OF NRC STAFF WITNESSES (continued):

Mr. Taylor (continued):

CASE Exhibit 479 (continued):

Also, Applicants Exhibit 38 which was used in identifying the crack is Drawing 2323-S1-0572, which is one of the specific drawings referenced in the G&H letter.

(From page 8:) In regard to CAR's (Corrective Action Requests), the Office Memorandum to Bussolini from Mr. Tolson states: ". . . this mandatory requirement is considered to be redundant and does not contribute materially to the timely investigation and resolution of reportable deficiencies . . . By copy of this memo to your Houston office we are requesting an immediate deviation to the subject requirement followed by a timely formal revision to the procedure." (Emphases added.)

CASE Exhibit 482, NCR C-809 (especially page 1) --

6 - #10 horizontal additional bars omitted for beam, Aux. slab placement #002-7831-002 -- NCR is dated 10/26/77.

"Delete remaining additional beam reinforcement, leaving shoring in the Construction opening untill (sic) the 831'-6" slab and walls above that area are poured and cured. Then shoring can be removed."

"CAR #14" required.

CASE Exhibit 483, NCR C-810 (especially pages 1 and 8th) --

9 - #9 and 2 - #4 additional reinforcement bars around the elevator shaft door on the 832'-6" mat of Containment #1 were omitted, pour #101-7832-003. Repaired.

"CAR #14" required.

Back-up file page (8th page of NCR): " . . . design engineer has concluded that if the rebar for the Reactor Building Elevator Shaft as identified in the NCR No. C-810 and DC/DDA-477 had been omitted, cracking of the concrete in this area could have occurred under some bending conditions, such as a seismic event. However, this cracking of the concrete in this area would not have had an effect on the nuclear safety of the plant." (Emphases added.)

CASE Exhibit 484, NCR C-811 (especially 1, 4-6) --

46 - #9 rebar dowels on the face of the excess letdown heat exchange room in Reactor Building #1 were omitted. CAR #14 required.

It was not possible to drill all of the re-drilled holes or obtain the specified embedded depth on some of the drilled holes; (one of them were plugged, one was embedded only 5", one was 11"?, one 11½", 4 others were less than 2', 13 were less than 3', 7 were less than 3', etc., out of a listing of 35; see page 6). "Hole depth to be 48½"."(Page 1.)

And on page 4 it is stated:

"The design engineer has reviewed all of the data provided by the above references and has determined, that with the following corrective action, the steam generator compartment wall will be capable of performing its design function at the location identified by the above." (Emphases added.)

CREDIBILITY AND/OR COMPETENCE OF NRC STAFF WITNESSES (continued):

Mr. Taylor (continued):

It may be that Mr. Taylor was not aware of the preceding items, since he did not become NRC Resident Inspector at Comanche Peak until 1978 (Robert Stewart, who also testified in these proceedings, was Resident Inspector before Mr. Taylor). However, consider the following, which occured after 1978:

> CASE Exhibit 534, NCR C-1314 -- (especially pages 1-4) -- dated 1/17/79.
> In Reactor Bldg. #1 elevation 808'-0" @ Az. 180° between columns 9 and 10, specification was violated, due to the installation and removal of shoring and scaffolding in this area. A total of 57 #5 dowels partially embedded in set concrete have been bent and another 10 #5 dowels have been broken off at the concrete. Repaired.
> Page 3: Design Change Authorization 5080; "Applicable Dwg: 2323-S1-0519, 2323-S1-0520, 2323-S1-0521. Add foundations for the neutron detector well cooling units at El. 808'-0" per the attached figure.
> See comments regarding potential tie-in with crack in base mat, CASE Exhibit 479, NCR C-669, preceding.
> Also, Applicants' Exhibit 23 which was used to identify the crack is Drawing 2323-S1-0519, which is specifically referenced in the DCA on page 3 of this NCR.

As stated in CASE's 10/18/82 pleading, page 34 (emphases added):

> "WITH REGARD TO EXHIBITS 364 (C-520) beginning on page 31 of this pleading through Exhibit 534 (C-1314) above, THERE IS NO INDICATION THAT ANYONE HAS EVER DONE ANY ANALYSIS OF THE POSSIBLE TIE-IN BETWEEN Exhibits 479 and 534 AND THE CRACK IN THE BASE MAT OR RADIATION SHIELD DISCUSSED IN THE JUNE (1982) HEARINGS. NEITHER IS THERE ANY INDICATION THAT ANYONE HAS EVER DONE A STRESS OR SEISMIC ANALYSIS BASED ON THE DELETION OF REBAR, ETC. IN VARIOUS LOCATIONS, ESPECIALLY CONTAINMENT #1. THE DOCUMENTS REFERENCED HEREIN ARE ONLY A SAMPLING OF SUCH DELETIONS."

From Inspection and Enforcement (I&E) Report 79-18, covering inspections during August and September 1979 (NRC Staff Exhibit 70), page 13:

> "Unit 2 Containment Concrete Placement Activities
>
> ". . . b. Placement 201-5805-032
>
> "On September 4, 1979, the licensee Site QA Supervisor notified the RRI (Resident Reactor Inspector, Projects Section, R. G. Taylor - see page 1 of attachment to cover letter) that a quantity of shear tie reinforcing steel (cross-connecting the reinforcing steel on the inside

CREDIBILITY AND/OR COMPETENCE OF NRC STAFF WITNESSES (continued):

Mr. Taylor (continued):

face of the wall to the outside face steel) had been omitted from placement 201-5805-032. The omission was reported by an ironworker foreman. The shear ties are additional steel comparable to reinforcement utilized throughout the entire elevation and were called for in the design to take localized stresses just below the springline of the wall to the building hemispherical dome.

"The licensee stated that the engineer had directed the placement of the missing steel in the next placement (201-5805-033) and that the structural integrity of the containment was not affected. The RRI inquired as to why this matter had not been reported to the RRI as a 'potential' significant construction deficiency in accordance with 10 CFR 50.55(e) at the time of initial identification of the problem on August 27 rather than after the fact on September 4, 1979.

"The licensee informed the RRI that he had applied the various judgemental factors involved in 50.55(e) and had determined that the matter was not significant and therefore, not reportable. The RRI reviewed the documentation and reported the situation to Region IV management. Subsequent discussions between licensee and NRC management resulted in the licensee issuing a stop-work order on further concrete placement in the Unit 2 wall and dome pending a thorough technical review of the matter. These discussions and confirmation of the stop-work order were documented in a Region IV letter to the licensee dated September 7, 1979." (See CASE Exhibit 248.)

"The licensee's Architect/Engineer developed an engineering analysis indicating that the additional steel placed into concrete placement zone 201-5805-033 adequately compensated for the added steel missing in 201-5805-032. . . " (Emphases added.)

(See also CASE Exhibits 617 and 618, the formal report and supplementary report from Applicants to the NRC regarding this matter.) As indicated by Applicants (CASE Exhibit 617, page 2, Attachment), this was an apparent breakdown in the QA/QC Program.

It should be noted that Applicants did not intend to report this omission of rebar in the Unit 2 Containment at all under 10 CFR 50.55(e). It should also be noted that this occurred during the same time frame when Mr. Taylor stated (NRC Staff Exhibit 195, page 3, 1979 NRC Trend Analysis):

CREDIBILITY AND/OR COMPETENCE OF NRC STAFF WITNESSES (continued):

Mr. Taylor (continued):

> ". . . It seems likely to me that the licensee will use his full powers to be less open with us in the area of identified construction deficiencies than he has in the past. I think he will take maximum advantage of part 50.55(e) and the guidance to go through the necessary formalities but avoid, if at all possible, having to report to us. . . ." (Emphases added.)

During October of 1979, Resident Reactor Inspector Taylor did a special investigation into allegations by a former site construction worker. These allegations were discussed by Mr. Taylor in I&E Report 79-26/79-25 (CASE Exhibit 253) and concerned the following allegations:

> Allegation 1: "In the Unit 1 Auxiliary Building at elevation 807', rebar was omitted in four columns in the EA wall." (Emphasis added.)
>
> Allegation 2: Concerned a 20' x 20' honeycomb area in the concrete slab acting as the ceiling above elevation (floor) at 832' in the Unit 1 Auxiliary Building, in the area just before entry into the Unit 1 Safeguards Building.
>
> Allegation 3: Concerned a mixup in anchor bolts which had been interchanged in Unit 1 Containment.
>
> Allegation 4: "There is general cracking of floor slab concrete in the plant buildings." (Empnasis added.)
>
> Allegation 5: "Horizontal tie rebar was omitted in Unit 1 Containment/ Containment Wall." (Emphasis added.)

Regarding Allegation 1, as stated by Mr. Taylor in the I&E Report at page 5:

> "Reference to design drawings revealed that there are only four columns in the EA wall of the Auxiliary Building. . .These columns, as well as the entire EA wall, extend virtually from the building foundation to the roof. Brown and Root NCR C-806, dated October 27, 1977," (this is in addition to the NCR's previously identified in this pleading) "stated that it had been discovered, while erecting reinforcing steel for the EA wall above elevation 831', that reinforcing steel in four columns had been omitted in the preceding erection activity; i.e., between elevation 807' through 831'. The NCR stated that twelve bars, each one inch in diameter, were omitted from each column and that four separate earlier concrete placements were involved during a period from May through October 1977. The NCR information was submitted to the Architect/Engineer

CREDIBILITY AND/OR COMPETENCE OF NRC STAFF WITNESSES (continued):

Mr. Taylor (continued):

> for resolution which was provided by Design Change/Design Deviation Authorization No. 486, dated November 1, 1977, authorizing not only the omission of the steel between 807' and 831' elevation, but further directing that it be omitted in the balance of the columns through elevation 873'. . . . the omitted steel constituted 50% of the vertical steel on one of the four column faces and . . . the remaining steel is of the same spacing as the comparable steel in the wall face continuing from column to column.
>
> "The only unaccounted for disparity between the allegation and the referenced NCR is that of dates of occurrence, a difference of five to six months. The RRI has concluded that the allegation and the NCR are related to the same event since the allegation, as stated, was hearsay information and the construction of the columns involved was a a one time event. Therefore the alleged time frame is in error." (Emphases added.)

It would appear that this was the incident to which Mr. Taylor was referring at Tr. 6495.

The I&E Report states on page 4:

> "d. Two unsupported general allegations were also made regarding general cracking of floor slab concrete in the plant buildings and omitted horizontal tie rebar in the Unit 1 Containment wall. Without specifics, the alleger was advised that these could not be pursued." (Emphases added.)

In the further discussion on page 7 of the Report, it is stated:

> "Allegation 4.b: Omitted Horizontal Ties in Containment 1 Walls
>
> "The RRI has not been able to either effectively substantiate or to refute this allegation. It is hypothesized that the alleger misconstrued an event which occurred in the Unit 2 Containment wall just before his final period of emplcyment. This event involved the initial omission of horizontal ties (more commonly referred to as shear ties) in the upper part of the Unit 2 Containment wall and is discussed in Inspection Report No. 50-446/79-18. This hypothesis is based on substantial indications that all of the allegations made were essentially based on hearsay information relative to events about which the alleger had little or no personal knowledge." (Emphases added.)

It should be noted that there is no indication as to why the RRI believed the alleger was even mistaken about which Unit was involved; it appears that

CREDIBILITY AND/OR COMPETENCE OF NRC STAFF WITNESSES (continued):

Mr. Taylor (continued):

the RRI is inferring that the alleger didn't even know which Unit he was working in.

It is difficult to understand how Mr. Taylor, in answering the Board Chairman's specific question as to "whether from any source of information whatsoever do you know of portions of the containment from which steel has been omitted because of engineering judgment?", would have remembered that he (Mr. Taylor) had performed an inspection based on a nonconformance report regarding reinforcing steel being left out of the auxiliary safeguard building primary wall -- while at the same time he did not remember the far more serious omission of shear tie reinforcing steel in the Unit 2 Containment, which should have been reported by the Applicants under 10 CFR 50.55(e), about which subsequent discussions were held with Region IV and Applicants with the result that the NRC told the Applicants to issue a stop work order (see CASE Exhibit 248), and which resulted in the reinforcement's being left out based on the A/E's engineering analysis. It is especially puzzling in light of the fact that Mr. Taylor referred specifically to the omission of reinforcing steel both in Unit 1 Auxiliary Building and in Unit 2 Containment Wall in the same investigation report.

To be as charitable as possible, this raises serious questions about Mr. Taylor's memory -- so serious, in fact, that it calls into question his credibility as a witness in these proceedings, since there may be other, equally serious problems which he has forgotten to inform the Licensing Board about.

ORIGINAL

NUCLEAR REGULATORY COMMISSION

P/M

In the Matter of:

Texas Utilities Generating Company	:	
	:	DOCKET NO. 50-445
Comanche Peak Steam Electric Station,	:	50-446
Units 1 & 2	:	
	:	

DATE: September 15, 1982 PAGES: 4838 thru 5178

AT: Fort Worth, Texas

TR&I

ALDERSON REPORTING

400 Virginia Ave., S.W. Washington, D. C. 20024

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37pp

R156

BY MR. WALSH:

Q Mr. Finneran, you stated that there was one support in March of '81 that had been unstable similar to this one shown on 4-O?

BY WITNESS FINNERAN:

A Yes.

Q Okay. What measures were taken after the discovery so that no more reoccurrences of these unstable supports would come about?

BY WITNESS FINNERAN:

A The possible question of the instability of the support I was talking about was raised as a result of the normal review process by the responsible design organization.

The support that I'm talking about is identified by --

Q Well, was the --

BY WITNESS FINNERAN:

A May I finish my....

JUDGE MILLER: Finish your answer, please.

WITNESS FINNERAN: The support that I was talking about as identified in March of '81, I believe the original design of that support, to the best of my knowledge, was similar to this one here on 4-O, and it was a strut and a clamp arrangement.

The field engineers, as I related yesterday, had modified the support to this configuration shown here.

The field engineers, and I reiterate again, do not have any design responsibility for the support.

In the normal review process of that field change, I believe it was identified that the field engineers had done something that was questionable as far as the stability of this support was concerned, and requested that a change be made to it to improve the stability of the support.

That was done.

BY MR. WALSH:

Q What procedures -- Just a moment, please.

What measures were taken to stop the reoccurrence of these configurations?

BY WITNESS FINNERAN:

A Well, I indicated that I believe the problem with support was identified in the normal review cycle by the responsible design organization, and I would assume they would continue to pick up those same kinds of problems as they reviewed changes that we made in the field to the supports.

Q Therefore, no measures in regards to the instability of the support was promptly --

MR. REYNOLDS: That's argumentative,

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Mr. Chairman.

JUDGE MILLER: It is. You've had the answer, and I think you've had full information. The objection is sustained.

BY MR. WALSH:

Q Has there been an NCR written in regards to unstable pipe supports?

MR. REYNOLDS: He answered that question before, Mr. Chairman.

JUDGE MILLER: I'm not sure. Did you answer it before? I don't recall.

MR. REYNOLDS: Someone on the panel did.

JUDGE MILLER: Well, perhaps, but he's asking him.

Do you have the information?

WITNESS FINNERAN: To the best of my knowledge, I know of no NCR written because of unstable pipe supports, nor do I know why there should be one written on these.

They were picked up in the normal design review process.

BY MR. WALSH:

Q Did you say field engineers had modified the pipe support to make it unstable?

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BY WITNESS FINNERAN:

A The field engineers made modifications to the support. They are not responsible for the design of the support.

Q What is their responsibility?

MR. REYNOLDS: Objection, Mr. Chairman.

JUDGE MILLER: Well, he may tell. It's been gone into.

WITNESS FINNERAN: I think I explained this yesterday. The field engineers that work for me interface directly with the craft.

JUDGE MILLER: In this connection; I think he's asking for a particularized interconnection there.

In terms of the subject that he's been discussing.

WITNESS FINNERAN: Yes.

JUDGE MILLER: Rather than general, could you be more concrete?

WITNESS FINNERAN: I'm trying to be specific as to exactly what their functions is, field engineers.

JUDGE MILLER: Well, the function in regard to the changes made in the field. This is the context.

WITNESS FINNERAN: Yes, I believe so.

JUDGE MILLER: Okay. In that context, go ahead.

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WITNESS FINNERAN: They interface directly with the craft. Their function is to resolve interferences with the craft, and make and document changes that will resolve these interferences, and that's all their function is.

JUDGE McCOLLOM: Mr. Finneran, may I ask this question. Who told them what to do to make the change of this interference?

WITNESS FINNERAN: The field engineers?

JUDGE McCOLLOM: Did the field engineers decide what the change was going to be?

WITNESS FINNERAN: Yes, they do.

JUDGE MILLER: They did. We're talking about a specific area now.

WITNESS FINNERAN: Yeah.

JUDGE MILLER: Okay.

JUDGE McCOLLOM: All right, and yet they are not responsible for determining whether it's stable or not?

WITNESS FINNERAN: No. They just document what they have done, and that documentation will go on to the responsible design organization for the support, and they will review what the field engineers have done.

JUDGE McCOLLOM: The responsible design organization is the one that designed the original one?

WITNESS FINNERAN: Yes. In the particular case of the support I'm alluding to in March, I think the original design organization was ITT.

I think there's some confusion as to how the field group operates. They have no design responsibility.

All they do is interface with the craft and make changes, document those changes; and that change will then be reviewed by the responsible design organization.

If the responsible design organization decides that the change that the field made is not appropriate, then we will modify the support in accordance with their request.

JUDGE MILLER: I have a problem with that in the sense that all this interfacing business doesn't explain to me why this particular instance, the field engineers made certain changes which ultimately turned out to result in some instability.

Why did they go ahead and do it without first obtaining clearance or consultation with those who have the responsible job? Why is it coming afterwards, as you are describing all this interfacing business?

WITNESS FINNERAN: The purpose of the group is to resolve interference problems with the craft in the field expeditiously.

JUDGE MILLER: That means speedily.

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WITNESS FINNERAN: Yes.

JUDGE MILLER: Well, then, was it because of speed that they went ahead and made a certain change that ultimately was determined to result in instability?

WITNESS FINNERAN: From a study of the complete situation, these gentlemen, these field engineers make their judgments based on a certain amount of knowledge and --

JUDGE MILLER: I'm talking about this particular thing now. I don't want generalities or their general knowledge. You keep giving general answers to specific inquiries.

Please, sir, address yourself to this particular instance, because we know that there was a result of instability.

We're trying to find out why. We're also trying to find out why it was done in the field without a clearance from these people who apparently have the sole authority.

Now there's something here that we would like to have explained.

WITNESS FINNERAN: That's what I'm trying to explain.

JUDGE MILLER: All right, then, keep away from generalities.

What happened in this instance, and if you don't know, we'll try to find out; but I think maybe you have enough information.

WITNESS FINNERAN: I think the question will be clarified if the function of the field engineers is understood.

JUDGE McCOLLOM: Let me ask a question.

It seems to me like -- I'm being disturbed by the fact that you say they have no design responsibility, and yet they made a change which I consider to be design.

If you change something in the field from what the original design was, that's a new design. Is that a wrong concept?

WITNESS FINNERAN: No, it's -- Until that change would be approved by the original design organization, I would not consider it to be design.

It's simply a change that's made to the support that allows the craft to continue, and if the change is not acceptable to the design organization, it will be modified.

JUDGE MILLER: Isn't that putting the cart before the horse? Before you go ahead and make changes out there in the field that can have some effect on stability, why didn't you get the appropriate clearance from the people who have the expertise and the responsibility

first, not last, not because of what the general practice is, not because of interfacing, but before it's done, why don't they see to it that expertise is brought to bear, rather than go ahead and do it and leave it to all these concepts of who is going to catch it and when?

WITNESS FINNERAN: Well, if you compare the two processes that could occur. If there was an interference problem with the support in the field, and it was identified that a change needed to be made, and then if you went back to the original design organization for the support and identified to them that there was an interference problem with the support, they would pull out all the applicable documents and try to research the change that might be made. They aren't necessarily in the field, okay?

The original design organization in this case is in -- in ITT's case -- is in Providence, Rhode Island, so they are not accessible to the site.

By the time they produce the design change and it got back to the field, that's a very long iterative complicated process and took a lot of time and very expensive.

JUDGE McCOLLOM: Let me ask this. Do the qualifications of the field engineers prepare them to do such design? Are they prepared and have the ability to do the design of those kind of hangers?

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WITNESS FINNERAN: Generally, yes.

JUDGE MILLER: They are design qualified, then?

WITNESS FINNERAN: Well, no.

JUDGE MILLER: That's what we're asking. Don't be under any misapprehension of the thrust of our questions in this regard.

WITNESS FINNERAN: Well, I'm not. I want to understand exactly what your question is.

JUDGE MILLER: We want to know that the people in the field who are going ahead and making these changes for the reason you've indicated and all the rest of it, we want to know they are qualified to do it, and we're not trying to look at some organizational chart to find out.

We want to know who these people are and what qualifications that they have to reasonably enable them to go in and do this, as you've described it.

WITNESS FINNERAN: Well, let me finish the three examples that I started.

I described the one process to you of the way a design change might be made to a support.

JUDGE MILLER: Okay.

WITNESS FINNERAN: The second process would be if an interference was identified and someone somewhat knowledgeable about supports --

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JUDGE MILLER: "Somewhat knowledgeable," did you say?

WITNESS FINNERAN: Yes.

JUDGE MILLER: "Somewhat knowledgeable"?

WITNESS FINNERAN: Yes.

JUDGE MILLER: Go ahead.

WITNESS FINNERAN: He wouldn't need to be someone who had a great deal of experience in design supports, but he would be somebody that was familiar with basically the interference problems that could occur on the site and what could be done that might be acceptable support design to correct the support to solve those interference problems, if he would go ahead and make that change immediately on an interim piece of change paper, and then allow the craft to go ahead and continue construction on that hanger based on that change.

Then that design change paper go back to the original organization for their review and approval or not.

Those two processes, the first one is very expensive, and the second one is less expensive and they are both as effective in coming up with a design document that does describe the support.

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Our experience in these cases has been that less that about five percent of the changes these field engineers made, had to be modified by the original design organization. So, it has proved to be a sound economic decision on our part to proceed that way.

JUDGE MC COLLOM: How many times, roughly, have changes had to be made out in the field?

WITNESS FINNERAN: I would say many times.

JUDGE MC COLLOM: What percent of the time or --

WITNESS FINNERAN: Almost every support, to my knowledge, requires some type of minor change.

JUDGE MILLER: Well, a minor change to one person with certain expertise might be a whale of a lot different than that of some other person, with more or less expertise.

You see, what we're trying to find out is, the somewhat qualification or some of these words that you use to dilute a little bit the expertise and the responsibility of the person in the field who is causing changes to be made which could have some stability factors and we want to know how it's done or to trace it through.

Now, I think you've given the two methods. I can't say that it's a subject of criticism but you obviously have excluded the first method because of the time it takes and the expense. I know those are not inconsiderable

factors but when you come to safety matters, they aren't paramount either.

That's why I want to be sure that since you have indicated that the second method is the reasonable one, in your judgment, then in order to test it's adequacy, as far as our record is concerned, we need to know the qualifications the people actually have. You say somewhat. We need to know what the somewhat is and that the residue, after you subtract the somehwat, enables these people to do a professional safe job in the field.

Now, that's what we're really probing at. You are helping us but I don't think you've yet given us -- and maybe you don't have the total information on it.

WITNESS FINNERAN: Well, the two key issues, I believe, are that the changes that they do make are documented on change paper and that will go right to the original design organization for their review and approval.

JUDGE MILLER: That takes months.

WITNESS FINNERAN: No.

JUDGE MILLER: Oh. I thought you said that took time to go to the original group up in Podunk or wherever it was.

WITNESS FINNERAN: In this case, to expedite that review, we do have a staff of those people on site, then, to review those.

JUDGE MILLER: That tells me something.

Go ahead and tell me about that.

I thought we were taking all this time and expense because it took so long to go past A, but maybe you've got something in the field that helps and, if so, we would like to know about it.

WITNESS FINNERAN: Well, that group is there to review these CMC's as they are produced and modifications will be made if they are required.

JUDGE MILLER: Okay.

You may ask.

BY MR. WALSH:

Q You stated that five percent of the supports had to redone; is that correct?

BY WITNESS FINNERAN:

A The figures that I recall were that the changes that these field engineers have made that less than five percent of them have been required. The people who reviewed the changes have required that less than five percent of them had to make some kind of modification.

Q Do you recall what documentation that was?

BY WITNESS FINNERAN:

A No. It is, to my knowledge, based on discussion with people.

MS. ELLIS: I just wanted to clarify something

for the record.

I believe we did this yesterday but for the record, in case anyone was getting this today, when you say ITT, you referred to ITT Grinnell; is that correct?

WITNESS FINNERAN: Yes, that's correct.

JUDGE COLE: Mr. Finneran, your comments about field changes, that less than five percent of them required correction, that applied to all of the aspects, did it not, not just to pipe supports?

WITNESS FINNERAN: Well, I can only answer on the matter of pipe supports.

JUDGE COLE: All right. Thank you.

BY MR. WALSH:

Q Is there any documentation on the cost and installation and removal or reinstallation of a new support compared to the cost of having some engineer evaluate the CMC before the modification is made?

BY WITNESS FINNERAN:

A Well, I personally wasn't involved in the decision to proceed with the field engineering group but I believe the decision was made on the basis of an economic decision and all of the appropriate procedures to make sure that the field engineers would do nothing that would encumber the design or stability of the support where installed.

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MR. REYNOLDS: Mr. Chairman, might this be a convenient time to take a break?

JUDGE MILLER: Yes. We'll take a ten-minute recess.

(Short recess.)

JUDGE MILLER: Everybody be seated, please.

Mr. Walsh, are you ready to interrogate?

MR. WALSH: Yes.

JUDGE MILLER: You may proceed.

BY MR. WALSH:

Q Mr. Finneran, is it,to your knowledge, a standard engineering practice to make changes in the field and document it later and to verify that the thing is okay later?

BY WITNESS FINNERAN:

A It's not documented later. It's documented at the same time the change is made.

Q Are you saying that they make a calculation before they make the modification to the support?

BY WITNESS FINNERAN:

A Yes. The field group that I am referring to is the staff of some engineers and technicians with experience in pipe supports and they do do some calculations before they make some of these changes, yes.

WITNESS REEDY: Mr. Chairman, may I make a

comment?

JUDGE MILLER: Yes, you may.

WITNESS REEDY: There is a question as to whether things are standard and I would like to point out that the design of a piping system with our supports is an iterative process. You have two different groups, a piping group and a support group and they have to work together and do their independent design and work back and forth as an iterative process, usually around five times. It is not unusual to do this.

In fact, there is no other way you can do it on a piping design system and I feel that the impression here is that this is something abnormal.

I've been associated with at least fifty nuclear sites and this is the way it's done.

I'd also like to point out that in the design of nuclear reactors, which I have designed at least twenty, you must have a design group make some assumptions, order material and start fabrication at the time prior to the start of the anlysis, and design and analysis on a reactor, also is an iterative process, and you can change your design loadings by modifying the structure, the same as you can in piping.

If you have a support that may be unstable or in one certain direction, that can be accomodated quite

a few ways. Changing your loads, adding more supports or not necessarily even requiring stability in one or more directions.

So, I haven't heard anything here that is unusual. We keep bearing on it and I just wanted to clear the record. This is the way it's done. I've have extensive experience and I don't see anything unusual.

JUDGE MILLER: Thank you.

I think the Board will probably have some questions in that regard when we finish the examination, so we appreciate your giving us your overall view. It's helpful.

All right, Mr. Walsh.

BY MR. WALSH:

Q So it is true, they do provide calculations prior to making a change in the field; correct?

BY WITNESS FINNERAN:

A Depending on the nature of the change required, they do do some calculations,yes.

Q Are those calculations incorporated at that time in the design package?

BY WITNESS FINNERAN:

A No. The calculations are done to try and assure the change we are making will be a good change.

Q All right.

This particular support that's shown on 40, did you say the field engineers made the changes?

No . That's two questions there.

Is it true that the field engineering group makes the changes?

Is that correct?

BY WITNESS FINNERAN:

A The field engineering group does make some changes, yes.

Q And they do sometimes provide calculations; correct?

BY WITNESS FINNERAN:

A They do sometimes make calculations; yes.

Q Those calculations are not included in the pipe support package; correct?

BY WITNESS FINNERAN:

A No, they are not. The changes made will go to the original design organization and they will review it and make all their own calculations for that change.

Q Are you aware if any pressure may be put on the engineers when they finally do receive the package, for example, on a support like on 40, to claim that this is now stable, so that as no rework would have to be required?

BY WITNESS FINNERAN:

A I'm aware of no pressure to that point.

The design engineers, when they discover a condition that they don't like which was made to their support in the field, they document what they want done to correct it, send it out and we do it.

Q I don't think I really got the answer to my first question after the break.

JUDGE MILLER: What was the question?

MR. WALSH: Does he know if it's a standard procedure to make a modification to a support without doing calculations? Standard procedures in the industry.

WITNESS FINNERAN: I think I stated that depending on the nature of the change, we would indeed make calculations before we make the change.

BY MR. WALSH:

Q But the question is, do other companies in the industry make changes without doing calculations?

To your knowledge?

BY WITNESS FINNERAN:

A To my knowledge -- I couldn't answer the question based upon my knowledge.

Q How about you, Mr. Scheppele?

BY WITNESS SCHEPPELE:

A I don't know, quite frankly. Although I think there could be a judgment made and that is, when you do get involved in any extensive structural changes, I think

it's very difficult to render purely a judgment in the field without doing something in the way of calculations.

Q Thank you.

How about you, Mr. Reedy?

BY WITNESS REEDY:

A From my experience, I know of a number of cases where it could be possible that slight modifications would be made, telephoned back to the engineers, ask for calculations of verifications, for a verbal okay with calculations, to proceed.

This is based on engineering judgment.

In other words, if someone asked me if it were permissable to put a clip in a certain location, just by describing that, reviewing the drawing, I could answer that without making calculations and follow up on calculations later. And, yes, that is standard. That is done.

I would say a significant change, however, he would probably do calculations

Q Would removing a clamp around a pipe and boxing it in, as shown on 40, be considered a significant change?

BY WITNESS REEDY:

A I'm sorry. I don't have the drawing you are referring to.

(Document handed to witness.)

Now, would you ask me the question?

Q If a field engineer removed a clamp that was attached to the pipe and put this frame up, would this be considered a significant change?

BY WITNESS REEDY:

A In my mind it's a significant change.

Q Thank you.

BY WITNESS REEDY:

A However, I would like to point out that this -- from your description of removing a clamp and putting on this type of framework around, is a much more conservative answer. So, I think, again, that you might be able to approve this type of change and make your calculations to verify it.

As long as you're going in a more conservative way and not harming the situation.

Q Mr. Reedy, Mr. Finneran has already said that this unstable. Do you disagree with him?

BY WITNESS REEDY:

A Stablility depends on direction of load. It depends on the loads themselves. It depends on the adjacent support. It depends on a number of things.

It appears to me, from a glance, that for a vertical upward load, this is unstable.

I don't know that it is designed to accomodate that type of load, however.

Q The load sheet is on the following page.

Is that support stable?

MS. ELLIS: That would be on Page 4P.

WITNESS REEDY: Again, Mr. Walsh, if I can -- and I don't have the concept -- I don't have the whole piping design system with me -- this does not appear capable of taking a vertical upward load.

B Y MR. WALSH:

Q Thank you.

BY WITNESS REEDY:

A I do not know the full condition of loading. I haven't looked at the design of the piping system. It's an iterative process.

Q Mr. Finneran, you said the field engineering group makes the modifications; is that correct?

BY WITNESS FINNERAN:

A That's correct.

Q You said that their qualification -- did you ever state what their qualifications would have to be?

BY WITNESS FINNERAN:

A Well, I think I did state in part of answer earlier that this group is staffed by some engineers and by some technicians with experience with pipe supports.

Q Mr. Finneran, how many in that group are engineers, at a percent?

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BY WITNESS FINNERAN:

A I couldn't guess. I know they have some engineers in the group and I couldn't guess the percentage.

Q Half?

MR. REYNOLDS: Objection.

WITNESS FINNERAN: No.

JUDGE MILLER: Sustained.

BY MR. WALSH:

Q Are there any registered professional engineers in that group?

BY WITNESS FINNERAN:

A I don't know.

Q Do the technicians do any of the calculations?

He said there were engineers and technicians in the group and I was wondering if the technicians did the calculations.

BY WITNESS FINNERAN:

A I think the technicians do some of the more simpler calculations. If a more complicated calculation is required on a support, very often they will go to an engineer.

Q Mr. Finneran, on the bottom of Page 42, under the approval, draw and check and revision section of that drawing, it's in the lefthand bottom left corner.

This appears to be an approved drawing.

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What is the significance of that and why isn't there a date there?

BY WITNESS FINNERAN:

A I really don't have enough knowledge to answer that. This cycle of approving a drawing, I believe, is a drafting cycle only. I believe each of these blocks, I believe, are just drafting personnel.

Q Does that mean engineering has not approved this drawing?

BY WITNESS FINNERAN:

A To the best of my knowledge, this is just drafting approval cycle.

Q Mr. Scheppele, is that the standard Gibbs and Hill uses, of having the draftsmen approve the drawings?

MR. REYNOLDS: Objection. This is a Brown & Root document. The question is irrelevant.

JUDGE MILLER: Overruled.

WITNESS SCHEPPELE: I would say as far as Gibbs and Hill's standard practice of producing the kinds of drawings that we produce, and I don't put pipe supports necessarily in this, we would have the drawings approved normally by an engineer.

BY MR. WALSH:

Q Mr. Finneran, should Class 1 pipe supports be approved by an engineer or a draftsman?

9-15

BY WITNESS FINNERAN:

A I think Class 1 pipe supports should be approved by an engineer.

Q Is that stated on the drawings?

BY WITNESS FINNERAN:

A I don't see it as stated on the drawings.

Q Is it stated in any procedure that engineers will approve the drawings?

BY WITNESS FINNERAN:

A Until the design is complete and approved by engineering, the drawing is not released for construction.

Q Isn't this built?

BY WITNESS FINNERAN:

A This approval cycle on this drawing only indicates, as I stated earlier, that all field changes have been incorporated into the drawing by the draftsmen.

Q Therefore, this approval does not necessarily mean engineering approval; correct?

BY WITNESS FINNERAN:

A That's correct. Just particular approval here.

Q Is that true on the Class 1, also?

BY WITNESS FINNERAN:

A I don't have the answer to your question.

Q Do you know of any procedures that would establish the approval cycle for drawings?

9-16

BY WITNESS FINNERAN:

A Well, I think you have to get into how the drawings are handled at the site, to understand that what this drawing here represents.

Q Is it a standard practice within the industry to --

MR. REYNOLDS: Were you finished with your question, sir? I mean, your answer?

WITNESS FINNERAN: No, I wasn't.

MR. REYNOLDS: May the witness finish his answer, Mr. Chairman?

JUDGE MILLER: Yes. If he has more to say, he may finish.

WITNESS FINNERAN: Well, the process of the drawing and how it's used at Comanche Peak to install pipe supports, is a very complicated one.

JUDGE MILLER: Well, wait a minute, now.

This is getting non-responsive.

WITNESS FINNERAN: Well, he's asking questions about --

JUDGE MILLER: If you know of any procedure, I think was the question.

WITNESS FINNERAN: Okay.

JUDGE MILLER: Do you know of -- the first thing, answer yes or no, if you know of.

9-17

WITNESS FINNERAN: Could I hear the question again?

BY MR. WALSH:

Q Do you know of any procedures for approving the drawings at Comanche Peak?

BY WITNESS FINNERAN:

A Yes, there are procedures for approving drawings at Comanche Peak.

Q Do you know how their approval cycle is?

BY WITNESS FINNERAN:

A In some cases I do.

Q What are they?

/ / /

BY WITNESS FINNERAN:

A From my own organization, I can answer it in how we --

Q How do you do that?

BY WITNESS FINNERAN:

A Could I ask Mr. Chang to answer one part of that?

Q No. Since you are the supervisor within the PSE group --

JUDGE MILLER: Well, he's asking you. If you can't, you may so indicate; but if you can, you should tell us what you can tell us.

WITNESS FINNERAN: Well --

JUDGE MILLER: If you can't, it's all right to tell us that you don't have any information.

WITNESS FINNERAN: Well, in PSE drawings, as far as sign-off on the drawings by the engineer, Mr. Chang could answer that question better than I could.

BY MR. WALSH:

Q All right.

BY WITNESS CHANG:

A Okay. For PSE, which means unsigned original design, basically the small bore piping, we do original design on site.

That approval on the drawing for small bore is

concerned is engineer approval, which usually is on the approval list, on the QA list, and is at supervisor level, whether drawing, checking or drafting.

Q Are you stating that there are two different procedures being used out at Comanche Peak, one group having engineers' approved drawings, and another group draftsmen approving drawings?

MR. REYNOLDS: It's argumentative, Mr. Chairman.

JUDGE MILLER: Well, let's find out. I don't know what he's arguing.

Are there two different methods?

WITNESS CHANG: No. I think Mr. Finneran might be referring to something else. There is a PSE, original design on site, which is only one procedure.

BY MR. WALSH:

Q Is this drawing generated at Comanche Peak, Mr. Finneran?

JUDGE MILLER: What is "this" drawing?

MR. WALSH: Excuse me. It's 4-O.

WITNESS FINNERAN: This drawing is generated from a drawing that is issued to the site by the original designer.

I believe that drawing by the original designer is approved by the engineer.

//

Q-3

BY MR. WALSH:

Q The approval on this drawing that's shown on 4-P, you said that approval is of a draftsman and not an engineer.

Is that in conflict with what Dr. Chang has just said?

BY WITNESS FINNERAN:

A No, I don't think so.

Q Didn't he just say --

JUDGE MILLER: Well, wait a minute. Let him explain.

WITNESS FINNERAN: This is not a PSE design. Dr. Chang just answered for the case of a PSE design.

JUDGE MILLER: Yes, I think that's it.

MR. WALSH; Okay.

BY MR. WALSH:

Q So PSE engineers approve the drawings, and for this particular drawing on 4-O and 4-P a draftsman approves the drawing; is that correct?

BY WITNESS FINNERAN:

A Well, I'm not clear as to who signed this approval block on this drawing. The original issue of the drawing, the approval block would have been signed by an engineer.

Q-4

It's a very complicated process.

Q How do you know that an engineer --

MR. REYNOLDS: Mr. Chairman, the witness is being interrupted in his answers.

JUDGE MILLER: We'll strike that remark. The witness may complete his response.

WITNESS FINNERAN: The original pipe support drawing, to the best of my knowledge, is released by the original designer, which we call the vendor designer. It would have been issued to the site.

The site would have turned that drawing into what we call a BRH, which is the drawing that's used to install the support in the field. It's basically the same drawing.

It's just for the -- see this Brown & Root designation on the drawing?

BY MR. WALSH:

Q Yes.

BY WITNESS FINNERAN:

A They just paste that over the ITT designation on the drawing.

Q So what is the significance of the approval on Rev. 3?

BY WITNESS FINNERAN:

A On Rev. 0 of that drawing it would be the

original design organization.

Q Yeah, but haven't modifications been incorporated on that drawing, and then indicated as approved by a draftsman now, on Rev. 3?

BY WITNESS FINNERAN:

A I can't answer that question very clearly. I really would have to confer with the drafting organization to see who exactly signed that approval block.

Q So you are saying the Draftsman Department did sign that part, correct?

BY WITNESS FINNERAN:

A I don't know. I was under the impression that they did approve that.

Q Then there is a possibility that on MPSI or ITT drawings, an engineer may not have signed off, correct?

BY WITNESS FINNERAN:

A No, I don't think so. On a drawing that would be used for construction, I don't think that's possible.

Q How about the revisions?

BY WITNESS FINNERAN:

A No, I don't think so. You have to realize that the CMC's that may have been incorporated in this drawing were approved by engineering personnel.

I might point out that after the final review of these drawings, they are stamped and signed by an

P/M

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY & LICENSING BOARD

- -x

In the matter of:

TEXAS UTILITIES GENERATING COMPANY, et al.

(Comanche Peak Steam Electric Station, Units 1 and 2)

Docket Nos. 50-445
50-446

- -x

Room 5B14
The Fritz Lanham Building
819 Taylor Street
Fort Worth, Texas

Tuesday, May 17, 1983

The hearing in the above-entitled matter convened, pursuant to notice, at 9:00 a.m.

BEFORE:

JUDGE PETER BLOCH
Chairman, Atomic Safety & Licensing Board

JUDGE KENNETH MC COLLOM
Member, Atomic Safety & Licensing Board

JUDGE WALTER JORDAN
Member, Atomic Safety & Licensing Board

MR. MIZUNO: I have a few additional direct questions before turning them over for cross-examination.

JUDGE BLOCH: Please proceed.

BY MR. MIZUNO:

Q. Mr. Taylor, on page 7 of the SIT report, the SIT indicates that of the 19 broad concerns raised by Messrs. Walsh and Doyle, 6 specific items of these concerns were identified and are being or have been corrected by the Applicants.

A. (WITNESS TAYLOR) That's correct.

Q. For these 6 items, could you briefly describe the fundamental source of these design deficiencies?

A. (WITNESS TAYLOR) The source of these design deficiencies?

A somewhat inexperienced engineering staff.

JUDGE MC COLLOM: What was that?

JUDGE BLOCH: A somewhat-- would the reporter repeat it instead of me.

WITNESS TAYLOR: A somewhat inexperienced eingineering staff.

JUDGE MC COLLOM: What does that mean?

WITNESS TAYLOR: It means that all engineers are not necessarily created equal, sir.

JUDGE MC COLLOM: Is that right?

WITNESS TAYLOR: Not all equally competent.

JUDGE BLOCH: Are these somewhat still unexperienced engineers still involved in design work at the plant?

WITNESS TAYLOR: Yes. Much of the original design you have to understand, is really taking our theoretical or hypothetical wall and a hypothetical pipe and trying to connect the two, and that takes a lot of people in the field of doing this.

JUDGE BLOCH: These are the people who are making the field modifications in order to get around interferences?

WITNESS TAYLOR: Yes, sir.

JUDGE BLOCH: Was this inexperience uniformly distributed among the group, or was it particularly characteristic of some members?

WITNESS TAYLOR: I really can't answer that question, sir.

The organization at my last knowledge was somewhere around 225 or 250 people, and I really can't say what percentage of them are inexperienced or what percentage of them might be relatively less competent.

I would tend to believe that probably a very small percentage.

How do I arrive at that next conclusion, is the next question.

JUDGE BLOCH: No, it wasn't.