JAN 28 1985

Docket Nos.: 50-445/50-446

APPLICANT: Texas Utilities Electric Company (TUEC)

FACILITY: Comanche Peak Steam Electric Station, Units 1 and 2

SUBJECT: SUMMARY OF MEETING TO DISCUSS THE COMANCHE PEAK TECHNICAL REVIEW TEAM (TRT) FINDINGS RESULTING FROM QUALITY ASSURANCE/ QUALITY CONTROL (QA/QC) ALLEGATIONS

On January 17, 1985, the staff and applicant representatives met to discuss the Comanche Peak Technical Review Team (TRT) findings resulting from the staff's investigation of Quality Assurance/Quality Control (QA/QC) allegations. These findings were outlined in a letter to M. D. Spence (Texas Utilities) from D. G. Eisenhut (NRC), dated January 8, 1985.

A copy of the meeting notice and a list of persons present are enclosed (Enclosure 1 and 2 respectively). The meeting was transcribed and a copy of the slides distributed at the meeting and the January 8, 1985, letter is bound into the transcript (Enclosure 3). The meeting lasted approximately two hours.

/s/

Annette Vietti, Project Manager
Division of Licensing
Technical Review Team

Enclosure: As stated

cc: See next page

CONCURRENCES:

CPTRT	DL#LB#1	CPTRT
AVietti-es	BJYoungblood	VNoonan
1/24/85	1/25/85	1/24/85

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XA

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

JAN 28 1985

Docket Nos.: 50-445/50-446

APPLICANT: Texas Utilities Electric Company (TUEC)

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Annette Vietti, Project Manager
Division of Licensing
Technical Review Team

Enclosure: As stated

cc: See next page

Meeting Summary Distribution

Docket File
NRC PDR
Local PDR
PRC System
NSIC
LB #1 Reading File
OELD
Project Manager AVietti
M. Rushbrook
R. Hartfield*
OPA*

OTHERS

*Caseload Forecast Panel Visits

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V. Noonan
Robert D. Martin, RIV
D. G. Eisenhut
Herb Livermore, RIII
Clif Hale, RIV
R. W. Hubbard
Ashdk Thadani
Victor Wenczel, TRT
Dean L. Summers, TRT
Mark W. Eli, TRT
Rudy W. Bonnenberg, TRT
James H. Maldnson, TRT
Robert R. Harbron, TRT
T. R. Workinger, TRT
Charles J. Haughney, TRT
T. E. Curry, TRT
V. W. Watson, TRT

25

bcc: Applicant & Service List

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Angelo Marinos, TRT
David C. Jeng, TRT
David Terao, TRT
B. J. Youngblood
C. E. McCracken, DOE, CMEB
W. C. Weus, TRT
Sue Gagner, OPA
John Zudans, TRT
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Robert F. Warnick, RIII
E. J. Sullivan, NRC/DE
A. R. Herdt, RII
E. L. Jordan, IE
V. P. Ferrarini, TRT
R. J. Masterson, TRT
Rick Keimig
Chet Pollusy, TRT
S. B. Burwell

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

ENCLOSURE 1

JAN 14 1985

Docket Nos.: 50-445
and 50-446

MEMORANDUM FOR: B. J. Youngblood, Chief
Licensing Branch No. 1, DL

FROM: S. B. Burwell, Project Manager
Licensing Branch No. 1, DL

SUBJECT: FORTHCOMING MEETING WITH TEXAS UTILITIES RELATING TO TECHNICAL REVIEW TEAM FINDINGS ON COMANCHE PEAK QA/QC PROGRAM

DATE & TIME: January 17, 1985
9:00 AM - 5:00 PM

LOCATION: Phillips Building, Room P-118
7920 Norfolk Avenue
Bethesda, Maryland

PURPOSE: To discuss the Technical Review Team findings relating to the Comanche Peak QA/QC Program as identified in the NRC letter dated January 8, 1985.

PARTICIPANTS:

NRC	OTHER
V. Noonan	J. Redding, et. al.
A. Vietti	
H. Livermore	
C. Hale	
R. Wessman	
R. C. Tang	
T. Novak	
B. J. Youngblood	
R. Keimig	
W. Smith	
L. Shao	
D. Jeng	
S. Burwell, et. al	

S B Burwell

S. B. Burwell, Project Manager
Licensing Branch No. 1
Division of Licensing

cc: See next page

NOTE: The above discussions will be transcribed.

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3pp.

ENCLOSURE 2

COMANCHE PEAK TECHNICAL REVIEW TEAM

BRIEFING - QA CONCERNS

JANUARY 17, 1985

NRC

Annette L. Vietti
S. Hou
Angelo Marinos
David C. Jeng
David Terao
B. J. Youngblood
C. E. McCracken
W. C. Weus
Sue Gagner
John Zudans
Richard Bachmann
Robert F. Warnick
E. J. Sullivan
A. R. Herdt
E. L. Jordan
V. P. Ferrarini
R. J. Masterson
Rick Keimig
Chester Poslusny
S. B. Burwell
R. H. Wessman
Vincent S. Noonan
Robert D. Martin
D. G. Eisenhut
Herb Livermore
Clif Hale
Victor Wenczel
Dean L. Summers
Mark W. Eli
Rudy W. Bonnenberg
James H. Malonson
Robert R. Harbron
T. R. Workinger
Charles J. Haughney
T. E. Curry
V. W. Watson
R. W. Hubbard
Ashdk Thadani

Dallas Times Herald

Jack Booth
Davis Reel

TUGCO

Jack Redding
L. F. Fikar
B. R. Clements
Michael D. Spence
John W. Beck
John L. Hansel

Dallas Times Herald

Jack Botta

Dallas Morning News

David Reed

TERA

Don Davis
John Guibert
Howard Levin
F. A. Dougherty

GAP

Nancy Wright
Anthony P. Penoso
Billie Garde

Southern Engineer Inc.
(for Brazos & Tex-La)

Bill Ruhlman

Energex/SRT

Tony Buhl

Ropes & Gray

T. G. Dignan, Jr.

Worsham, Forsythe, Sampels & Wooldridge

Robert A. Wooldridge

ENCLOSURE 2 CONT'D

COMANCHE PEAK TECHNICAL REVIEW TEAM

BRIEFING - QA CONCERNS

JANUARY 17, 1985

Bishop, Liberman, Cook Purcell & Reynolds

N. S. Reynolds

Ft. Worth Star-Telegram

Ron Hutcheson

Heron, Burchette, Ruckert, & Rothwell

Mark Wozette

TUSI

Dick Ramsey

ORIGINAL

UNITED STATES
NUCLEAR REGULATORY COMMISSION

IN THE MATTER OF:

DOCKET NO: 50-445-OL
50-446-OL

MEETING TO DISCUSS TECHNICAL REVIEW
TEAM STAFF FINDINGS - COMANCHE PEAK

LOCATION: BETHESDA, MARYLAND

PAGES: 1 - 64

DATE: THURSDAY, JANUARY 17, 1985

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

* * *

MEETING TO DISCUSS
TECHNICAL REVIEW TEAM STAFF FINDINGS - COMANCHE PEAK

Nuclear Regulatory Commission
Room P-118
7920 Norfolk Avenue
Bethesda, Maryland

Friday, January 17, 1985

The meeting was convened at 9:15 a.m., Darrell Eisenhut presiding.

ATTENDEES:

R. H. WESSMAN	NRC/TRT
VINCENT S. NOONAN	NRC/TRT
ROBERT B. MARTIN	NRC/RIV
MICHAEL D. SPENCE	TUGCO
JOHN W. BECK	TUGCO
JOHN L. HANSEL	ERC/TUGCO
DARRELL EISENHUT	NRC
HERB LIVERMORE	NRC Reg. III
C. HALE	NRC Reg. III
VICTOR WENCZEL	TRT
DEAN L. SUMMERS	TRT
MARK W. ELI	TRT
RUDY W. BONNENBERG	TRT
JAMES H. MALONSON	TRT
ROBERT R. HARBRON	TRT
T. R. WORKINGER	TRT
CHARLES J. HAUGHNEY	TRT
T. E. CURRY	TRT
V. W. WATSON	TRT
MARK WOZETTE	Heron, Burchette, Ruckert, & Rothwell
JOHN GUIBERT	TERA Corporation
R. W. HUBBARD	NRC/TRT
DICK RAMSEY	TUSI
MONTE J. WISE	WAI/TUGCO
MARTIN JONES	SELF/TUGCO
HOWARD LEVIN	TERA/CPRT
ANNETTE L. VIETTI	NRC/DL/TRT
JACK BOOK	Dallas Times Herald
DAVID REEL	Dallas Morning News
S. HOU	NRC/DE/TRT
ANGELO MARINOS	NRC/OSI/TRT
DAVID C. JENG	NRC/DE/TRT

-- continued --

ATTENDEES (Continued):

DAVID TERAO	NRC/DE/TRT
B. J. YOUNGBLOOD	NRC/DE/LB # 1
C. E. McCRACKEN	NRC/DOE/CMEB
W. C. WELLS	TRT
SUE GAGHER	NRC/OPA
JOHN ZUDANS	NRC/IE/TRT
BILL RUHLMAN	Southern Engineering (For Brazos & TEX-CA)
RICHARD BACHMANN	NRC/OELD
ROBERT F. WARNICK	NRC Reg. III
TONY BUHL	ENERGEX/SRT
JACK REDDING	TUGCO
L. F. FIKAR	TUGCO
B. R. CLEMENTS	TUGCO
DON DAVIS	TERA
T. G. DIGNAN, JR.	Ropes & Gray
ROBERT A. WOOLDRIDGE	Worsham, Forsythe, Sampels and Wooldridge
N. S. REYNOLDS	Bishop, Liberman, Cook, Purcell & Reynolds
F. A. DOUGHERTY	TERA Corporation
E. J. SULLIVAN	NRC/DE
A. R. HEROT	NRC Reg. III
E. L. JORDAN	NRC/IE
V. P. FERRARINI	EAS/NRC/TRT
R. J. MASTERSON	EAS/NRC/TRT
NANCY WRIGHT	GAP
ANTHONY P. PENOSO	GAP
BILLIE GARDE	GAP/CASE
RON HUTCHESON	Ft. Worth Star-Telegram
RICK KEIMIG	NRC/TRT
CHET POOHAY	NRC/TRT

P R O C E E D I N G S

MR. EISENHUT: Can I have your attention. We're going to go ahead and get started.

My name is Darrell Eisenhut, Director of Licensing, with the NRC. This is a meeting to discuss QA concerns on Comanche Peak.

In the way of background I should point out that over the last months we've had a program underway to conduct an intensive onsite review looking at portions of the facility. We've had a number of briefings here actually in this room before on the results of some of that work.

Today is actually the last briefing that we've programmed in this overall program where the Staff is giving a briefing of its findings, it's conclusions, bringing forth the issues.

Today we're going to be discussing the issues that were identified in the January 8, 1985 letter that I sent to Mr. Spence of Texas Utilities.

The Staff will go through today and discuss the findings, the issues, try to articulate the bases for our concerns. To the extent we can we're going to have the utility -- as I said, it's not the normal system -- but the utility has an opportunity to ask us questions, make sure you understand the issues and the questions as we see them.

Following today's meeting I think the process

will get back to more what I'll consider the classical normal review process where I would expect the utility to come forth with a revised program plan, to come forth with whatever program you would envision pulling out to resolve these issues.

I would envision us resolving the issues technically first and secondly, of course, in the project we have a hearing underway on some of these same issues. So after we resolve the technical issues it would be in that form.

I want to mention it because of the large number of activities that we have on this project. Looking at the project we've had everything from extensive routine inspections to a CAT team, that is a Construction Assessment Team, to an extensive review by a technical review team headed by Vince Noonan, who's here with me.

The utility, of course, has had an IDVP. A number of activities have been done. We have formed a QA/QC, basically a review group, to look at all these things in cncert and figure out what they really mean.

The management panel will assess what does all of this mean in concert. Some members of the panel that are addressing the subject are here today. They'll be here listening, getting up to speed, et cetera. The panel, of course, is described in my letter sent on January 8 of this year.

The basic format for today's meeting as I see it will be that we'd like to start off by giving the utility an opportunity, if you have any comments, followed by Mr. Noonan, his Staff on the TRT, and we'll go through in some detail the findings followed by -- if you'd like to make any comments during the discussion feel free to interrupt. We certainly would if it was the other way around so feel free to use this opportunity, Mr. Spence, you and any of your Staff.

At the end of the meeting I would entertain a short comment from any of the actual Intervenors in the hearing if there is a representative here today.

With me today on my left is Bob Martin, of course, who's the Regional Administrator, Region 4, in Arlington, Texas.

At this point what I guess I'd like to do is turn it over to the utility and Vince Noonan will go through the actual detailed substance of it.

Mr. Spence, if you have any comments before we get into the details of going through the set of slides, they have been made available on the table. The slide are here for anyone who doesn't have them.

One other point. We are keeping a transcript of today's meeting. That transcript will be served on all the parties in the proceeding so that transcript will be made

available shortly after this meeting.

With that, Bob, do you have any comments?

(No response.)

MR. EISENHUT: If not, Mr. Spence, if you have any comments then we'll go to Mr. Noonan.

MR. SPENCE: For the benefit of the recorder, I'm Mike Spence, President of Texas Utility Generating Company. We appreciate the opportunity to have this meeting with you today. We think it's important to us to serve as an opportunity to gain some further understanding of the QA/QC findings that you've identified in the January 8th letter and to help us make sure we have a thorough understanding of the basis for each of the issues identified to enable us to fully address them as we develop our program plan and schedule for resolving these issues which we will submit to you per the request of your letter of January 8th.

Let me say at the outset, as President of TUGCo I veiw these matters, these issues, as matters are of extreme concern to my company and to the Commanche Peak project. I recognize the need for us to aggressively address these issues and resolve them to my satisfaction as well as to your satisfaction.

I also recognize the need to recognize that our program plan and the actions that we take under that program plan would serve to establish the regular conference of the

agency in our plan.

In order to underscore the degree of importance that I place on these QA issues that you've provided us, I have directed our attorneys to request the Atomic Safety & Licensing Board to defer any formal hearings that might be scheduled before the board until March. And I've also directed our attorneys to ask the ASLB to suspend their consideration on pending 50.57 C motions seeking authority to load fuel and do pre-critical testing.

My purpose in directing these actions through our attorneys to the ASLB is to allow us at TUGCo adequate time to carefully assess these issues, both the TRT issue as well as the related issues before the Atomic Safety & Licensing Board and make sure we get a handle on the full extent of the scope of the problems. All this in order to satisfy myself personally that there are no issues left unresolved that may impact safety before we proceed with our request for fuel load authority.

With these initial comments I would like to introduce some of those that are here on behalf of TUGCo today. First, here at the table with me to participate in the discussions, on my left is John Beck, Manager of Licensing for TUGCo. On my right is Mr. John Hansel, Director of Engineering and Environmental Services Division of the Evaluation Research Corporation. Mr. Hansel serves

as review team leader on QA/QC issues on our Commanche Peak response team that has been formed to respond to all TLT issues. Furthermore, Mr. Hansel is currently President of the American Society of Quality Control and has 32 years of experience in quality assurance, quality control, reliability, and testing phases.

I'd also like to introduce some other outside members, outside being outside the TUGCo organization of our Commanche Peak response team, the review team leaders and members of our senior review team, who are here today at my request to learn firsthand how these QA issues that we're going to be discussing will impact our ongoing efforts related to TRT findings that you've previously identified.

I'll ask each to stand as I identify them. First, members of our senior review team that are here today.

Mr. Tony Buell? Mr. Buell is President of the Energex Corporation.

Mr. John deBear, Manager of Nuclear Safety and Licensing of the Terra Corporation.

Also, on our senior review team as an outside member who was unable to be here today is Mr. John French, who's Vice-president of the Delia Corporation.

I'd also like to introduce Mr. Lou Flacker, Executive Vice-president, Engineering and Construction, for TUGCo. And

Mr. Bill Clemens, Vice-president of Nuclear Operations and Quality Assurance for TUGCo.

We also have with us today industry experts whom we've engaged to serve as review team leaders on our Commanche Peak response team. I'd like to introduce these gentlemen to you.

Mr. Martin Jones is a private consultant and is serving as the review team leader for our electrical and instrumentation and control area of our response team.

Mr. Howard Levin, Manager of Engineering for the Terra Corporation. Howard is serving as review team leader for our civil, structural, and mechanical areas.

Mr. Monty Wise. Monty is President of Wise & Associates. He serves as review team leader for our testing program area.

Not able to be with us today as an additional outside member of our review team is Mr. E. P. Stroup, Director of Technical Services for Technology for Energy Corporation. And he is the review team leader for the protective coatings area of our response team.

I hope I've not inadvertently omitted any members of our team.

I'd also like to take this opportunity to introduce members of our legal team who are working on our docket here today. All of you have met Mick Reynolds, a

firm of Bishop, Lieberman, Cook, Purcell & Reynolds.

In addition to Mr. Reynolds, we also have with us today, Mr. Robert Wooldridge, General Counsel to Texas Utility Company, TUGCo. He's with the firm of Warsham, Forsythe, Sanders, and Wooldridge of Dallas.

I'd also like to introduce to you today, Mr. Tom Digman. Tom is a partner in the firm of Ropes & Gray of Boston, Massachusetts, and is a recent addition to our team. He provides us additional legal resources to support our ongoing legal efforts along with Mr. Reynolds and Mr. Wooldridge.

Referring back to the outside members of our review team whom I introduced, I expect to have input from these outside members of our response team before I respond with our program required by your letter of January the 8th.

I'm also -- I think it's worth mentioning before I close -- I'm also reviewing the present structure of our Commanche Peak response team to determine if it is the most appropriate structure to adequately address the concerns that have been raised in the January 8 letter.

Mr. Beck reminded me that I failed to introduce also Mr. Don Davis, who is here from the Terra Corporation.

With those introductions and opening comments, I'll turn it back to Mr. Noonan.

MR. EISENHUT: Let me make one short comment.

First, a logistics question and that is I hope to be able to, after the meeting of this morning -- I think in the schedule we're looking at we'll proceed along and try to wrap it up at whatever hour it takes but we're certainly here as long as you'd like to answer questions. I say that only because the weather situation outside and I do appreciate the large turnout and the interest in the meeting today.

I also want to introduce William Dircks who has joined us, Executive Director, NRC.

With that, Vince, why don't you proceed on?

MR. NOONAN: Good morning, Gentlemen.

My name is Vince Noonan, Director of the Commanche Peak project.

Just a few things before we actually get into the actual presentation by Mr. Herb Livermore. He's the group leader for the QA/QC team.

This is a meeting between us, NRC and the Applicants. At the end of this meeting we will have an opportunity for the public to make comments prior to closing the meeting. We're here this morning basically to talk about the QA letter that we sent out on January 8 that was in our findings and a few other things that might be of interest to the people here.

Our first SERs will be camera-ready early next

week and will be in Mr. Eisenhut's office Monday morning. We have, basically, the electrical and the testing SERs. They have been completed and are now being prepared for being camera-ready at the printers. We'll have civil and structural SERs shortly behind that and sometime in the early part of next month, between the middle to the end of next month, I'd have SERs in the position for NRC management to take a look at them.

We have -- basically, are working very hard to close out the feedback interviews and just a slight status on that is that we have a total of 73 allegers. We have basically given initial interviews to about 50 of those people and we have given what we call the actual final feedback interviews to about 30. We have about 19 people that we did not locate. We have tried various means to locate them including sending registered letters to them, but we cannot locate the people and we will continue to try to locate them, but there are about 19 there. Six have declined interviews with the NRC. They feel that they are unprepared to talk to the NRC at this point. We have sent those people letters also asking them to reconsider and we have about 18 now that within the next two weeks we hope to provide the final interviews. So the alleger program is moving toward its finish and I think we're pretty close to being done with that part of it.

This morning we're going to go ahead and start the briefing. I just have one slide to put up there as more or less a summary.

(Slide.)

You heard Mr. Livermore basically talk about these types of items. Maybe from my perspective in seeing the QA findings, we'll be seeing the number of findings here. I suspect that at this kind of an effort at any point, we're going to find -- I don't care what plan there is, we're going to find these kinds of things. What bothers us here is basically the numbers we found and the consistency with which we found them in the sample that we looked at. We also have concern about the management role, about management providing significant commitment to the QA/QC of the Commanche Peak project. I don't plan to go into anymore detail on that.

I think what we have to look at now is the hardware. The hardware is as we would want it for the startup of this proceeding.

With that I'm going to go ahead and introduce Mr. Herb Livermore. He's the group leader for the TRT.

Herb, go ahead.

(Slide.)

MR. LIVERMORE: Good morning. My name is Herb Livermore. I'm the TRT QA/QC Group Leader.

I have a group of slides now I'd like to show highlighting some of the items from our QA/QC letter to the Applicant.

Our first slide is a short overview of the as-built function. The TRT QA/QC Group had a group of five on-site sessions of two weeks each. I took over the group at the end of the second session. Personnelwise, we have varying -- anywhere from 14 to 20 people during the course of our stay down in Texas. This group of people had over 300 years experience in general engineering, nuclear and nonnuclear, including over 200 years in QA/QC.

Our major thrust was in the area of 124 allegations, issues and concerns in 12 categories, and they are listed, the 12 categories, there.

By the way, these slides are in your handout. Each one is exactly the same.

Our main thrust of effort was addressing the allegations. We have expanded on each. We tried to build an umbrella around each allegation, addressing any QA/QC concerns of a generic nature and any management problems we happened to discover along the way. Was management effective or ineffective, et cetera?

Our area was always safety-related. It encompasses Unit 1. We did not get into the operations area, and we did not get into the operations of QA. We used everything we could. We used depositions, transcripts, inspection records, the allegations, everything we could lay our hands on in addressing problems.

The output of our effort is now in a total of 65 SSERs, supplemental safety evaluations. They cover over 12 categories. Our effort is still in progress in this area.

The letter to the Applicants is the status of our efforts at this point. During our effort down in Texas about halfway through 124 issues we found examples of hardware problems. Problems that the hardware is not in accordance with the drawings. We found some examples of ineffective QC.

At this point, we were no longer in just a miss rate, hit or miss on hardware. Now we were shifting emphasis to program problems in the QA/QC area. The minute we realized this, we realized that no matter what we did programmatic-wise, there would always be questions, arguments, which are always contingent when you talk about QA/QC et cetera. So we said there's only one proof of the pudding -- go see how the hardware is, take a look at it, inspect a block of hardware. If it's okay; fine. If it isn't; then we know we do have problems.

So this new effort required an additional category, which we called "as-builts." And we embarked on our own hardware inspection.

(Slide.

The next slide has to do with our as-built inspections. I might talk about that a little bit. In our group, we had two teams of two personnel each, a total of six people.

Mark Ely, on my right, was the group leader in this effort. All the people in this effort were engineers and also MDE-qualified and they had experience in this type of sites.

Our time was limited in this effort to two sessions, and our applicable effort was in Unit 1, only safety-related hardware. We addressed only finished bought-off items, documentation from the vault, in all previously inspected, finished. The rooms were cleaned, locked up, security was in effect, and they were ready for fuel load. They were completed.

We used the existing QC check list, the same paper that the company used, and we did nothing new. We did inspections exactly the way that they were going to be done. Whenever possible, we brought along the two act QC.

Our findings in this as-built area do not include those of the other TRT group findings. They are in addition

to.

You note in our as-built, we start right off with pipe supports. The question is, why did we go to pipe supports? That s real easy. We had four allegations which just led us in that direction. It was just natural expansion. There was nothing funny about it. We just went up there. In the two-week span that we had, that was the easiest way to go.

You'll notice on the slide, we had 42 Class 1, 2 and 3 pipe supports inspected by the TRT. We found 46 deficiencies that were identified on 26 of the pipe supports. This is a general summation. We'll have some four slides that will tell you and show you what these problems were.

Types of pipe support deficiencies involved, you'll notice are listed there, from procedure inadequacy to material identification to welds to QC records. That type of thing.

Of this, we started to see some frequent occurrence in some of these deficiencies. These were loose or rather it was missing. This type of thing.

So at this point we said we've got to go further on this. So then we picked a room up in the Safeguards Building. We went into some of the struts and snubbers, some of the same types of problems. We picked a room and

just concentrated on that room. We uncovered some more deficiencies. We expanded some in the electrical area. Time was running out on us. We got into the electrical area. We looked at five electrical supports. Nine deficiencies were identified on three of the electrical supports. This will be shown in Table 6 on a later handout. These were hardware configurations and web problems.

Our findings will really show that the hardware was not in accordance with the licensee and/or code requirements. They were missed by QC. There were no NCRs for these particular items and there were entries on the QC check sheets that had been signed off. We did not attempt any engineering disposition, as these problems had clear importance. All we did was find them. They were not in accordance with the requirements.

Our safety significance of what we found is that QC did not find these deficiencies.

(Slide.)

On these next slides, on Table 1, if you'll bear with me, questions on the first slide should be answered by subsequent slides.

Again, I'll just touch the highlights on this.

Supports inspected by the group were 42. We jumped down; it says hangers with nonconformance.

There were 26. Total deficiencies, 46. In other words, there were 46 deficiencies on 26 hangers. The details of these are on Table 2 of the handout.

Down below, you'll notice we just say different types of deficiencies, 25. These were on Table 2 of the handout.

The welds inspected without paint by the TRT. We have with and without paint. A total of 394 welds were looked at. Welds needing repair were 10. Again, I'll note that all 42 type supported by the TRT had been previously final QC accepted.

MR. EISENHUT: Herb, let me make a comment. And let me make sure the reader down here is following the numbers. The way we're counting in this exercise, with 26 hangers, found some nonconformances. We're actually looking at the 42 supports inspected in the first place. I think it's theoretically possible to find thousands of deficiencies. It's not that there's a difference. The way we count, you can certainly find more deficiencies in supports than when you look at it in the first place. So I want to be sure that there's not a discrepancy between 46 and 42. When you look at all the welds, it's possible to find a lot bigger number.

MR. HANSEL: Many, many attributes.

MR. EISENHUT: It's the attributes of the hanger.

That's why there were 46 deficiencies found in 42 hangers.

MR. LIVERMORE: Thank you.

MR. HANSEL: Mr. Livermore, before you go on. On the six you found to be recurring, are you going to address those in more detail?

MR. LIVERMORE: Would you say that again.

MR. HANSEL: On the previous slide, you talked about six that had frequent occurrence back on mechanical. Are you going to address those in more detail?

MR. LIVERMORE: Yes, we will. There will be a slide that will detail those.

(Slide.

The second slide is just very brief. It shows you the buildings and the system breakdowns we went to. And as were noted in our letter to the Applicant, five originated from allegations and the other 37, the TRT just randomly selected. We didn't do anything like a machine-generated selection process. We started with the allegations and then just picked others we felt necessary to look at.

The total on that slide totals up to 42.

(Slide.)

The next slide, Table 2. These are, as I mentioned, some of the welding ones. We'll come back to that.

Here are the deficiencies we found other than

welding and the requirements for these deficiencies, again, were the Applicant requirements, the drawing procedures. These are the same ones we mentioned in the letter.

This Table 2 goes on a bit.

(Slide.)

I'm not really ready for that slip, but number one, I just want to mention a couple.

Notice how it set up a deficiency where it lists the hanger numbers and deficiencies in the hardware. Just another method of trying to present everything we looked at in different forms, so you can add or subtract it or do whatever you feel is necessary to address it.

Item number 1, the no-locking device on threaded fasteners.

We do have a slide over here, if somebody can clip that on.

(Slide.)

This is in your handout. This will identify some of the areas we're talking about here. No-locking device, threaded fasteners.

Anyway, there's a picture there. I think you'll be able to find most of these, like number 1, number 6 and number 7.

Number 6 is the snupper adapter plate. Insufficient thread engagement. You have that down right

in the picture.

Number 7, insufficient thread engagement, threaded rod sight holes. This picture shows where you can see the threaded rod. And if you look in there, you cannot see any evidence of the threaded rod.

So we'll just leave this up here. We do have a handout.

I think I need to put the light on, but you can follow it in your handout.

(Slide.)

Again, this is another list. 13. The snubber cold set dimension does not match drawing. Probably that was rated at 3/4 of an inch. Snubber orientation does not match the drawing. And the real purpose or the real seriousness of that one is that QC did not identify that. Whether or not engineering disposition says it's okay or not, the main importance is that QC did not pick it up and identify it.

(Slide.)

The next slide, 17 through 25. We'll get back and talk slightly about the welds. Again, this is strictly for identification. Notice the deficiencies total 46, and 42 pipe supports that were inspected by TRT had been finally QC inspected.

What I want to do now is kind of go back. This is kind of an overview.

Now I want to go back.

(Slide.)

Now you have slide, Table 3, that reviews the pipe support welds. This, again, is a repeat of the Applicant letter, but notice the 42 pipe supports. 6 supports required weld repair. We get 6 over 40. That's about 14 percent. Again, we're playing a numbers game, but I'm providing every form I can.

The total number of welds, it comes out at the bottom. The welds requiring repair, percent of total welds inspected is 2-1/2 percent. I might note at this point, in some other plants, the hit rate is about the same. Some of these same other plants did take corrective action.

One of the things we noticed, one might mention here, we talk about the welds, we did have to have the paint removed in these welds, because they were finished. This may have masked additional defects. Therefore, increasing 2-1/2 percent.

Table 4.

(Slide.)

MR. HANSEL: Did you use any nondestructive methods for examining those welds, or were those all visual?

MR. LIVERMORE: We only used NDE nondestructive methods. When I think, very minimally, it was necessary, as the code said, we would have had to follow out some

indications. I think we saw a couple of them. We saw indications of lack of fusion, and we wanted to follow that further. In that case, we did request and had the company cut along with us with their own ND people. We had our own ND qualified, but we wanted to be sure that they saw exactly what we saw at that point in time.

There was no minimal. We used the normal inspection methods for QC.

MR. HANSEL: The same as the Tugco inspectors did?

MR. LIVERMORE: Correct. Only in the cases where we felt it was necessary to go any further to see suspect areas, we did use some NDE liquid penetrant.

MR. HANSEL: How was the paint removed?

MR. LIVERMORE: We requested, first of all, paint thinner. It did not work. At that point, we requested the next thing was soft wire brushing. We ended up with medium wire brushing. And at that time, the limited amount of time --

MR. HANSEL: None of this probably would have affected the inspection or should have.

MR. LIVERMORE: It's unknown. Every time you start wire brushing wells, you start burnishing the metal and you may lose something there. It's just an unknown. That's why I mentioned previously, you know, we had to have the paint removed. And the percentage there, we might have

found more

Table 4. Summary of additional support inspections.

Now the original 32, we talked about who did this. We found some areas that required looking. We talked about 6 before. In addition to the original 42, we did an intense inspection of Room 77-N. Our concern, as I said before, we saw some of these same repetitive problems that weren't found by QC, so we increased our field of concern. And again, we did it in this particular area. We were time limited and just went in that direction.

This is a list here of some of these items. The first three, bearing clearance, locking device missing, pipe clamp halves not parallel. These were violations of site procedures. They're shown -- the load 10 locking device is shown on your handout. And we brought it out here, and it shows the percent efficient. The snubber adapter plate bolts with less than full engagement. We have to be determined there. The reason for that is that the code addresses the net end or stock and then says, no, you've got to have full engagement, whereas the site procedure says, yes, this may be valid. But the design justification calculations have not just been found. We could not find this or any backup, so we're leaving this to the licensee, and we're requesting you to provide us with this.

(Slide.)

Table 5. This is a continuation again. We did get into the electrical area, that we talked about the Hilti Kwick bolt. From 24 bolts inspected, we got three deficient. That's 12-1/2 percent in this minimum sample.

We did take an allowance to the site procedures and the requirements they had. These weren't just close. Sometimes you say, here, was this just a hairline in the middle of the line? And these weren't that case.

(Slide.)

Table 6. Again, a summary of the electrical support inspection. This, again, is the same as the Applicant letter. They were accepted by QC.

Why did we go to electrical supports? It was a natural reaction. We just went into the electrical raceway area and started with the hangers. The more massive, the more items on a hanger. Why did we use a tray? We started with hangers, and we stayed with hangers. We had more time, and we expanded.

Supports with problems. You can see 59. 5 and you get 3. The numbers gain there of 60 percent.

Types of deficiencies we're talking down here. Hardware related, unauthorized changes. Like undersized nuts, Hiltis skewed. You need to have additional stiffeners. We mention those later. And these are the same nine as previously mentioned.

And we give information in the building area and supports.

(Slide.)

Table 7.

MR. HANSEL: Herb, I am a bit confused. Okay, I have got it now. Welds requiring rework. 41 out of the 59 required some rework?

MR. LIVERMORE: Yes.

MR. HANSEL: 41 out of 59.

MR. LIVERMORE: Welds requiring rework out of the supports inspected.

MR. HANSEL: Again, I am not trying to play a numbers game, but when you count welds you can --

MR. LIVERMORE: Agreed. We did not give you a total of all the welds in all the different hangers.

MR. HANSEL: But out of the supports, you had five supports, and that included 59 welds. I just want to make sure I am reading the data right.

MR. LIVERMORE: That is true. Support welds inspected, 59. Welds requiring rework, 41.

Am I correct on that?

VOICE: Yes.

MR. LIVERMORE: Again, we weren't trying to sensationalize either. This is our way of putting it down. We just named the number of problems. We didn't have the

time or the expertise -- I shouldn't say expertise -- or the people at the time to go and count all welds, to make a total.

We were there, we collected our problems, brought our problems back here and just presented them.

MR. HANSEL: I am just trying to understand the scope and size of it. Thank you.

MR. EISENHUT: The point Herb just made is a good one. We didn't try to go in and do and exhaustive thing, but we actually probably did something that is unprecedented in terms of the size and the magnitude of what we did.

Going in -- well, you can figure the numbers of weeks, the numbers of people, and the numbers of hours we spent on it.

As Herb said, we didn't feel we had the time, nor was it appropriate, to go in and try to do an exhaustive look at all the welds. However, we feel, I think, that we have got a large enough sample that we can say that it is indicative of the kinds of problems that exist out there.

You know, you can play these numbers games any way you want. As Herb mentioned, I think the first one, the numbers we saw in some places are not out of line with what we saw at some other plants. But I think that is where we are.

MR. HANSEL: I was not trying to play the numbers

game to reduce it down. I just wanted to understand what he was saying.

MR. EISENHUT: I appreciate that. I am just trying to make sure we put it in the proper perspective, though, because we didn't try to do an exhaustive. But we still thought we did something that was unprecedented in the magnitude of what was looked at on the issue that we did.

I am sorry, Herb.

(Slide.)

MR. LIVERMORE: Thank you.

Table 7 is just a recap or summary of the general type of deficiencies in the pipe supports and the electrical supports.

I won't go through that. I will just mention undersized welds, excess welds not on drawing, and excessive locking devices for that engagement not verified, clearance of supports out of tolerance -- just a smattering of everything.

I think that totals up to 23.

(Slide.)

The next slide, Table 8, is more or less a conclusion to this as-built effort. The conclusion is the same as on page 20 of the Applicant's letter. There is nothing new there.

We felt the results of this were that the QC

inspections were ineffective, the craft construction in those areas was certainly faulty, and we found that the hardware was not as per the as-built drawings and the hardware potentially is not represented correctly in the final stress analysis.

We expect the licensee to address this. The bottom line is we did a very limited sample. Yet we found a lot of problems, too many problems, we felt.

These hardware deficiencies really confirmed what we found in some of the other areas. As I mentioned, we start off the first few weeks and we started to find QC and QA problems and documentation problems, which led us to this area. Now that we have found these hardware deficiencies, this more or less confirms what we had found before.

With that, I would like to then leave the as-built effort and go to the next slide, which is the quality assurance program.

(Slide.)

These items that are in the Applicant letter are items that we found in the course of our investigation in the allegations areas that we expanded.

There was no periodic management assessment of the overall effectiveness of the QA program. In other words, there was no regular reviews of program adequacy by senior management, by a group, by Mr. Clemens or a group that was

independent of his function. The main thing is there was no assessment of the site QC program.

We felt the audit function was understaffed. There were only four during the peak construction period. This was also a CAT team finding. Region 4 is addressing this now in their report. They are still finding problems in this area, no regular audits.

Repetitive NCRs were issued, indicating a need to retrain construction personnel. We talk about approximately 18 of these in one specific area, a specific NCR that went for nine months with no action in this area.

Examples of incomplete and inadequate workmanship and ineffective QC inspection. We just covered that. That is the as-built effort I was talking about there.

QC inspectors were in positions of reviewing their own work records. This was an item on craft transferred to the QC document review group. 14 of 18 people were in this situation. They were actually reviewing their own work.

One case specifically was identified by the ANI. The main thrust there is the opportunity is there. The system should prevent something like this. If the opportunity is there, it will happen.

MR. HANSEL: Mr. Livermore, could you help me? Was that in one craft, one skill, or was it widespread?

MR. LIVERMORE: Vic, was that in one craft? I

think it was more than one craft.

MR. WENCZEL: It had welders, and it had a number of inspectors who actually went out and inspected some hardware and later on verified their own inspection records. The ANI returned some of those records back to Quality and had them reverified by someone else.

MR. LIVERMORE: We have details on that.

10 CFR 5055-E reporting system deficiencies. We have examples of this in the Applicant letter. This is still going on.

Region 4, in forthcoming Report 8440, is going to note again that there are still problems in this area. There is no action to evaluate a potential 5055-E, no corrective action taken.

The more important thing will be the examples we found, which we will show later. The system needs bolstering. The threshold for reporting is too high. Exit interviews for departing employees were inadequately structured and ineffective. We give details on that in the Applicant letter.

This effort was evidently in place after the CAT report. Really, the bottom line of that is that it is not being aggressively implemented at this time.

The corrective active system is poorly structured and ineffective. You see the same deficiencies in the

document control system again and again. One that we are going to bring up later is the valve disassembly problem. We see that again.

I guess that my question of the Applicant is: what is your conclusion as a QA professional as to this program?

(Slide.)

The next section of the slide is on QC inspection. These same items are detailed in the Applicant letter.

One of the areas again is the fuel pool liner traveler irregularities. We did get into it through allegations.

The preentering of a SAT inspection result on the inspection check sheets we feel certainly prejudges an inspection and prejudges results. There are examples of changing inspection dates. There were a great number of occurrences, questionable signatures, change procedure for another inspector.

I will just go down here. I am not going to get into them.

Missing QC sign-offs, missing signatures. This has all been hashed and rehashed, and we found the same things everyone else did.

The bottom line is, on this, the QA/QC group felt

that the QC program in regards to the fuel pool was not controlled.

Inadequate description of resolution of pipe whip restraints. This is detailed in the Applicant letter. This is a request for information.

We could find no basic criteria for how you made your selection of certain hangers in regard to engineering analysis, and we could not find what hangers had paint removed and which ones didn't. We didn't lose the information, we just couldn't find it. We are, of course, looking for more information.

An example here would be deficiencies in letters of September 18th and November 29th. These are our NRC letters to the Applicant from the TRT groups on QC inspection problems, such as in the electrical area -- cable separation, termination, crimping, cable splicing. Also, the examples on this QC inspection would be examples of the as-built section of the QC ineffectiveness.

I don't have a slide on this. We did in our other talk about T-shirt incidents. There have been numerous discussions in the Board testimony and discussions in the Applicant letter.

Our bottom line is with the QA/QC group: we just felt that the QA management may have acquiesced to construction pressures and complaints and failed to

support their own people.

And our bottom line question to you is, you know, is this any way to run a QA program?

(Slide.)

The next slide is on document control. The document control problems are not as great today.

We went out and went to the field and interrupted work people and looked at their drawings, actually what they were working to. We did this. There were a thousand examples out in the plant, in the workplace, and the welder and the person doing mechanical work.

We pulled their drawings, checked that drawing back in document control to see if they were using the actual up-to-date drawing. We found this in good shape. We found just minimal problems.

That is the good part. The other part is that there were still numerous problems inside the DCC. That is what this first article is. Potential exists for the DCC satellites to issue deficient document packages to craft personnel. That potential is still there in the form of their implementing instructions. They are only on charts. They are not detailed in procedures.

There is a lot of band-aiding going on in that particular group. And with all the cross-checks and double checks they are doing, their output is coming out all right,

but the potential still exists until the procedures and charts, et cetera, get in order.

We go on to mention that drawing control was inadequate prior to July 1984. These are old history items. There were recurring deficiencies -- field distribution, changed a file to file custodians and satellites. Recurring deficiencies. Cygna and everyone else in the world -- your own paper identified all these problems.

And finally the trend reversed when top management participated in the corrective action process. It is finally okay, but eventually is not good enough. It should have been much earlier.

Procedures governing the 10 CFR 5055-E deficiency reporting were inadequate.

The next line under that, consideration of reporting these Cygna audit findings to NRC. That is an example of that. That certainly was a significant deficiency, one that certainly falls under the realm of the 5055-E requirements. That certainly should have been identified to the NRC, and it wasn't.

Next slide.

(Slide.)

Training qualification.

Before I get into that, I might mention the NDE

QC. There are very few personnel there, and their qualifications checked out okay. We have no problem. They are all qualified with the SNT.

What we are talking about here is basic QC qualifying, ANSI N45.2.6 in the Reg Guide. We have got a whole list here, and it is the same as in the Applicant letter. I am not going to go into every one of them. I will just touch on some of the more important ones here.

20 percent of the training records review contained no verification of education or work experience. We looked at approximately 102. This is over and above the other TRT groups. We did not duplicate theirs. They had their own findings.

We looked at approximately 20 percent. We looked at approximately 102. I think this 102 -- I think the greatest amount of QC onsite at one time was 400. We picked 102 and 20 percent.

The training records contained no verification of education or work experience. These requirements come from ANSI N45.2.6, which we are committed to.

The third one down. After failing a certification test, a candidate could take the identical test again. This is a violation of your procedure.

We found approximately 10 cases, which we are talking about 10 percent. Seven inspectors had

questionable qualifications.

What do we mean by that? Example: a carpenter is hired into QC. Within two months he was Level 2 qualified in three areas. Now, that is very excessive.

We found a laborer hired as a QC from the labor department. Within four months he was qualified in numerous areas plus being a weld LP.

We are not saying that there aren't brilliant people that can certainly do this, but we are saying this is certainly an exception to the norm and just raises questions.

No guidelines for the use of waivers for on-the-job training. There just weren't any.

No formal orientation training for DCC personnel prior to August '83. There isn't anything more to be said on that.

The other highlight I would like to mention is further down. It says: "Exemption provision in ANSI 45.2.6 which allowed substitution of previous experience or demonstrated capability was the normal method for qualifying inspection personnel rather than the exception."

You normally find in ANSI 45.2.6 they will give you two exceptions, which is testing or on-the-job training. We found that the normal rather than the exception down there. That was the normal way of qualifying

people. It got into the norm rather than the exception.

What happens then, the minute you get into that as the norm, you are much more liable to abuse it. By then you have practically bypassed all requirements.

The Reg Guide is very specific in this case. It says if you use this method you have to have documented objective evidence. We did not find this.

I might mention that I understand that you are or have already embarked in this particular area, training and qualification. We see it as a good sign.

MR. HANSEL: Did you include both ASME inspectors and non-ASME inspectors in this data?

MR. LIVERMORE: Yes. In this first section here, as we go down, you will notice it is all both inspectors. As we get down below, then we say "additional problems in the non-ASME certification."

MR. HANSEL: So basically, the first few items, bullets, apply primarily to both; then when you get down to the non-ASME, you are primarily looking in those areas at the non-ASME function?

MR. LIVERMORE: That is the way we try to arrange it.

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You said there the additional problems are in the non-ASME certification testing. The site actually divided itself up into separate Brown & Root QC groups for ASME qualifications, inspectors, and other separate groups for the non-ASME which is the remaining safety-related items. This is not Brown & Root. This was TUEC. That's why we have to address them separate.

The additional problems -- they were like two different scoring methods to grade tests. We found -- I think the electrical group found the same problem. The questions could be weighted in any way, shape, or form. They used different methods and they did it regularly and there didn't seem to be any explanation that certain people had passed the test while others couldn't.

By changing the rules of the test there was no backup material or rationale explaining the use of this. There were no guidelines on how a test question should be disqualified. It was frequently used but we could find no example. Different people would take the same test. One person they would just disqualify and say that question he'd missed and say, well, for this particular person we disqualified him but there was no rationale or explanation.

The TRT conclusion, our QA/QC group concluded we felt, that this places the qualifications of QC in a highly suspect category and we certainly want you to address this.

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We understand you are.

Next slide.

Well, the next handout is a valve installation. There was a lack of control to prevent the lost damage and interchange of parts when valves were disassembled prior to welding the valve body in the line piping installations. This, of course, had to do with three systems.

Certain valves required that the bottom internal removal were required to be removed prior to welding so they would not be ineffective. This process was fully controlled. The installation process was fully controlled also in that the parts were piled high in uncontrolled areas so there could be loss, damage, or interchange of parts. This was a very big potential for the interchange of these parts and there was a high potential that they could be interchanged with valves with different pressures and temperature ratings.

We talked to the vendors on this particular item. We found that you had found some of the same problems along the way that you kept identifying. Identifying them again and again and again, but never taking any corrective action. That was one of the big problems.

The other, of course, is we didn't actually find any of those specific valves that were interchanged. There were findings from the ANI in your group that they had been

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done. We didn't find any that were interchanged for different pressures and ratings but we did identify this as a problem and you did also.

Slide 8, which we don't have, is on the onsite fabrication in the iron fab shop. We have a number of items here. I'll skip through them. These are the same as in the Applicant letter. The scrap and salvage in the laydown yard was not identified. We did not have restrictive access. Bulk materials were mingled with controlled safety and nonsafety materials in the laydown yard. There was the site cleanup operation that happened out there and the system broke down.

Another finding was the material requisitions did not comply with applicable procedures. Rather than use a travel they were using a material wrench. There weren't any procedures that specifically showed, delegated, directions on how to use this. The material recs didn't identify the code classifications. They were used as process sheets. They couldn't identify the inspection requirements.

Another thing, the shop foremen -- we're talking about three of them here -- were not familiar with the procedures that they were controlling under their responsibilities. We found that a real problem. We talked with them. They couldn't identify their own procedures they would be using and they couldn't identify what the

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procedures numbers were when whey were listed on a piece of paper. They had to talk to their own QC men to get that information which was rather backwards. These procedures were in the area of electrical supports and miscellaneous steel and pipe supports.

Skip down. QC site surveillance of the material storage weren't document. We found out that the QCI and miscellaneous steel required a monthly random surveillance of the storage and control in that area. This was the ASME area and it was deleted, just stopped, about a year ago. So QC decided that it wasn't going to do it anymore and that was it. The procedures were still in effect.

MR. HANSEL: Herb, let me make sure I understand. I understand that the inspection stopped. You say they're not documented but they actually stopped. They were not conducted for what period of time in the last year?

MR. LIVERMORE: About a year ago. We're talking about random surveillance.

MR. HANSEL: So it was not only not documented but not done.

MR. LIVERMORE: That's the way I understand. Is that correct, Jim?

VOICE: Yes.

MR. LIVERMORE: Another item is work in the fab shop performed in response to memos and sketches instead of

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handing out packages or the material recs, as they called them before. This is actually fabrication without available -- well, this is a standard practice. We found in one procedure on the construction side of the house they said it was possible to do some work on material without procedures yet the same applicable QCI says you shan't do any work. Material work shall be done for specific procedures. It was a catch-22 situation. We view this as a violation of criterion 5.

One of the things -- well, that's all for that particular item.

Slide down on the housekeeping and system cleanliness. I'm not going to say too much about that. You can talk about the swipe tests on the reactor vessel. The procedure required only two swipe tests on the vessel. We kind of questioned the adequacy of why only two. We figure this is a common sense thing. It's certainly not sufficient for a vessel that huge and that important to only do two swipes.

I don't think this is any way to really run an effective QA program, protective coverings, welding activity addition to snubbers not covered with a protective device. Our people out in the plants in three rooms found snubbers that were not protected. There were ongoing welding and grinding, et cetera. There's a requirement that they do

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protect it and that's a violation of the procedure.

(Slide.)

Slide 10. I think we've got the slides back now. The non-conformance reports. These are the same items as we've got in the letter. One of the things we did look at and we spent our time down there and I did ask the people as we went through our work to just make a list of all the different forms that the site uses to identify non-compliances or deficiencies. As we went through we finally said, hey, it came to exactly 39, roughly, on that particular thing. These were forms recording deficiencies yet when you go to the collective action program you'll find in accordance with requirements of criterion 16, corrective action for preventing reoccurance, there wasn't any trending on these. Maybe there was trending on four or five main specific reporting requirements like NCRs or IRS or SAT IRs. It raised the question to us that it's something you certainly should look at. With that many types of forms floating around the plant you look at it make that type of thing gets into the trending system.

MR. HANSEL: Let me make sure I understand. You found 39 different reporting formats and you found trending being conducted on --

MR. LIVERMORE: I'm guessing roughly four or five; there may be more. We didn't go into that much

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detail. It's just a site thing we looked at once we got all the data back and started adding it up.

MR. HANSEL: So there were 39 different ways or possibilities to record a non-conformance or discrepancy?

MR. LIVERMORE: Or discrepancy or deficiency or big concern, that type of thing. We have a list of those which I furnished to you. All of these details, by the way, will be in the SSER. They are still being worked today. As has been said they'll be out very soon. Meantime if anyone does need information on the details we'll certainly supply it.

The rest of these NCRs are inadequate instructions for handling voided NRCs. There were no explicit instructions. We found NRCs used as a tracking document but not defined in procedures. In other words, they were used for a purpose other than what was intended for by procedures. We don't care what you're using them for but please explain them by the procedures.

There's a couple of others here. Inconsistency in reporting non-conformances. Some areas you had to report your non-conformance to the supervisor in QC and other areas you had to report them to the paper flow group.

There was a conflict in procedures. Two TUGCo NCR forms in use by construction -- there is one with an ANI sign on it. Something I think that should be looked into.

DAVpp

No identification of the cause of non-conformance or steps to prevent reoccurence, no evidence of QA management involved by QA signoff. We feel these things are certainly necessary if we're going to implement a good trending corrective action program.

Next slide.

(Slide.)

Slide 11 is on materials. We did not find any material traceability problems. We performed a material traceability inspection on 33 of the as-built supports. As my as-built people were going through this I had another group take that information and follow it all the way through the vault to the records right back to the chemicals and physicals on the material. In other words, to a complete material traceability inspection. The results were satisfactory with a few minor problems.

What I've got on the materials here is really old history. Back in '81, you did have a major traceability problem where you're cutting up pipe hangers. This was identified and I think you momentarily lost your end stamp down here. The ANI people came down and did a corrective action.

Here is another example of a major construction problem that was not identified as a 5055 E to the NRC. When I talk about identified, identified per the

DAVpp

regulations formally.

I'm about to go to the last of my slides and I just want to recap here on the QA/QC group. I feel our group -- we've been given our marching orders to stay together, stay on this whatever corrective action comes out. We feel that we are very fair and firm regulators and we are certainly willing to work with the utility and the Intervenors and the public to provide any more detail necessary, to provide any constructive criticism. We'll certainly make it constructive. We will not become part of your decision-making process. We will not tell you how to provide the recommendation. It's your responsibility and we will measure you by your actions.

I guess this is just something for me and my group. We are very upbeat about your plant, your potential for recovery, and we see some good preliminary signs of action.

At this point if there's no further questions I'd like to turn this back over to Vince.

MR. NOONAN: I'd like to make just one general comment. Within the TRT and all the groups involved we had about 70-some people. Herb's particular group -- I don't exactly remember but probably at one time we had better than 20 people at that plant. We've gone back every five, maybe six times. We've asked each group leader as they've

DAVpp

finalized their SERs if there are any concerns or anything that we need to do, to identify it to me because we'll do it.

At this point in time on the basis of the conversation I have I haven't received any great big input. Herb is still in the process of finalizing this.

If there are things that we feel we haven't looked at enough, if we can do it we're going to do it. I really would like to get the SERs to you because there are levels of detail in there that you need to see more than would be normally put into our letter.

With that -- oh, one other item. When I first came on this thing I went to the site and we spent the better part of a day talking to the QC inspectors. I talked to about 70 inspectors, groups of maybe from four to seven people, and one of my project management people was with me. We made available to these QC inspectors phone numbers that they could call us. We said if there's any concern they have with this plant please let us know because we want to come back here and we want to make sure we look into it. If we missed it we want to find out about it. To date, I have not received any phone calls.

Dan?

MR. EISENHUT: I have a couple of comments.

First, let me give a couple other comments

DAVpp

related to the T-shirt incidents. That did occur, as you will recall I think, down in -- we flew down to Texas and I, in fact, met with the people involved in the T-shirt incident. I guess it's fair to say that it was my perception that meeting with the QC inspectors at that time that the basic thrust was ultimately it boiled down to not being a healthy communication link relating to the followup and resolution and fixing the details.

The examples that were brought forth by the individuals at that time, I remember, were a number of details that they felt there just wasn't certainly a communication feedback loop that showed at all that those issues were followed up on. And that's how I guess I'd characterize it, Mr. Spence.

You certainly have looked over my notes, too, so you certainly have that information.

I'd like to make a couple of other broad comments relating to the details and the kind of thing we went into. Recall first that the concerns we have and have been identified here and at the previous meetings are broad-based concerns. I want to emphasize we did not go out doing the review only of allegations. When we designed the review it was to be an overall type review. We went out and looked at a number of things that occurred on one of the earlier items.

DAVpp

The reviews we've done in this area and a number of other areas were broad-based enough that we think we have a good enough understanding of the problems that are there that require corrective action. Some percentage of those I think we would say are not out of line than what we could find elsewhere but they do if they aren't followed.

A number of the other items, I just want to emphasize what was on a few of Herbs slides, and the same thing we found in the previous meetings was that a number of the issues of what we would call potential issues or the condition is suspect or really are problems in the area that's indeterminate.

DAVbw

The ball is back in your court for you to follow up on.

Another example is the training qualification of QC inspectors. There clearly is a lot of work you're going to have to do to go back and check those individuals in a number of cases. If you find that the qualifications were all right, that's past the first hurdle. If you find the qualifications aren't all right in a particular area, you'll have to go look at the work again.

On the other hand -- and I forget, Herb, I think it's the NDE inspectors, the qualifications you didn't find any problems with. So there's some on both sides of the table. But I think you really have to go back and look at the potential problem. In a number of ours, we consider as potential problems, they're problems, but the substance is a potential issue, because we can't determine that things are all right.

Now when we looked at this, we had several options. One of the options we had was to -- I don't mind telling you -- considering going back and requiring an independent consultant to reevaluate the entire program. I happen to be one that's not enamored with that approach any longer, because I really believe the utility has to develop the capability themselves, if the utility ever hopes to operate their plant. I say that, because I am impressed

DAVbw

with the group we've brought together so far on the project. Not intimadated, just impressed.

(Laughter.)

MR. EISENHUT: I would like to caution that it's going to take a lot of decisive action and follow up in pursuing the issues to bring them together to resolution. I am encouraged, however, because we've been on this project, working with intensive effort, for many, many months. And I believe we're at the point now where at least the problems have been identified.

The ball is in your court, as I said, to resolve those problems.

I might also suggest that you're not the first utility to be facing some of these problems. For example, the qualification of the QC inspectors, I know, has been an issue on at least two recent plants, where utilities have mounted major problems that have brought those programs under control and resolved them to our satisfaction. Both of those plants now have low power licenses.

So those are situations that I think are workable, but only workable, if there is a very vigorous aggressive program with the right qualifications and talent and wherewithal brought to bear on it. That is, Herb Livermore and Vince both said the Staff is going to be working extensively on the site. We're going to continue to be

DAVbw

working with follow up on a number of these issues. We're available for follow-up discussions. We'll have individuals down at the site to discuss the issues, so you can understand them.

One last issue I want to mention, which also is an encouragement to me.

Many of you may know, or a lot of people probably don't know, there was an event last week at the site with respect to welders. One of your welders, as you recall, was -- the NRC Staff was going around and talking with individuals. One of your welders, and one of your welder supervisors, was talked to by the Staff. The Staff had a number of questions. I'm very encouraged that the utility took the steps they did. I understand from talking to a number of the Staff, you folks have gone back, put all the welder supervisors -- I think it was welding supervisors, through a qualification training program last Saturday. I'm encouraged that a large number of individuals went through that program acceptably. I think that's the kind of aggressive action it's going to take at each step of the process to solve these kind of problems. And I really commend you for it.

But while I say that, on the other hand, there is a huge pile of work that's on the menu, as you can see here. But at least I look at it as we're now to the point

DAVbw

where the principal problems have been identified. There will be nuances to them coming along, I'm sure.

We're available to continue to work with you, but basically, the problems are now on the table.

Now, Vince, did you have any more comments -- or Bob? Herb?

(No response.)

MR. EISENHUT: I want to also ask, is there anyone else with the Staff who worked on this effort that wanted to make any other comments or raise any other issues that we didn't highlight to get a different perspective on them.

If there is, I want to give them the opportunity.

(No response.)

MR. EISENHUT: If not, Mr. Spence, I turn it back over to you.

MR. SPENCE: Fine; thank you.

Thanks to all of you for the information you presented to us today. It's going to be helpful to us, as we assess these issues and develop our responses to them.

I was a little bit surprised that my technical folks here today had no more questions than they did. I think that speaks to how complete and concise a job you've done in presenting the issues to us, both in the written report and in the presentation today. I guess from my point of view, it's clear that we realize we've got more work to

DAVbw

do than we have questions to ask at this point in time to Mr. Eisenhut and to Mr. Livermore's comments about continuing communications on the site. That's encouraging. I think it's important to us, in our success in addressing these issues and developing the plan adequately, to close them out with you, that we be able to have continuing increased technical dialogue between our team leaders and your team leaders, as we get into these issues further and make sure we understand all the background behind them and to allow us fully to address them.

I would just make a couple of other observations, I guess, in closing, from TugCo's point of view, and that is to reemphasize something I said at the beginning, that while we believe we have a safe plant, I'm still very concerned about your findings and their potential implications on our plant and on our program.

With respect to the safety implications, it's clear to me that some changes are going to be necessary for us to fully resolve these issues, according to the results of this report.

I want to give you my personal assurance that whatever changes are necessary in our programs or in our management of our quality programs, they will be made directly and aggressive.

I think it's probably clear to you, we're going to

DAVbw

need a little time to digest all this and fully assess it on our own part, to make sure we better understand the issues before we react and formulate a plan and a schedule that we would submit to you.

We're not going to rush into that. As president of the company I have to make sure that our program does not fall short of the mark. So we will be thorough in our assessment of these issues as we develop that program.

I can make these general observations about the thrust of the program as we get into it.

First of all, in the response that we develop to these QA issues, we'll be using reviewers with no prior involvement in the issues, to direct our responses to the issues. As problems are confirmed, I'll make sure that we correct them for future activities and analyze their impact on past construction.

Darryl, your comments, I recognize also the importance of our obtaining a fresh perspective in the analysis and resolution of these issues. That's one of the reasons I invited all of our outside industry experts here today, not to intimidate you, just to show yo that steps were taken, as a demonstration of our efforts to get these fresh perspectives in the analysis of these issues and their resolution.

As I indicated to yo in my opening remarks, I'm

DAVbw

also reviewing the current structure of our overall response team to all the TRT issues, to make sure it is adequate, to adequately respond to your January 8th letter on these issues.

I guess, just in way of summary, let me say, in response to Herb's closing comments, partially, you have my personal assurance that TugCo is dedicated to achieving the highest safety possible at Comanche Peak. We don't have any higher corporate priority in the Texas Utilities Company than the safe construction and operation of our nuclear program.

As the owner of the plant, I recognize that the ultimate responsibility for the safety of the plant is ours and ours alone. It's not a responsibility of our contractor, our AE, and it's certainly not the responsibility of this agency. We take that responsibility seriously and intend to aggressively address the issues to demonstrate our achievement of that objective.

MR. EISENHUT: I appreciated that.

Just a point of clarification. If I understood what you said in the beginning, you are requesting the ASLB to defer any hearings until March. I think it's our feeling we would support that, because it's our belief that the first thing we want to do is resolve the technical issues before we take them before the hearing.

DAVbw

With regard to you reviewing the structure of the response team, I take it then that you would want any detailed comments on your previous program plan, but no organizatonal comments on your previous program plan.

MR. SPENCE: Yes.

MR. BECK: We want to iterate on rev 1.

MR. SPENCE: There may be a rev 2 to the rev 1.

MR. EISENHUT: If there are no other comments from the Staff -- let me ask, is there a representative from the Citizens Association for Sound Energy, an Intervenor in the project, who would like to give any comments today?

MS. GARDE: Yes.

My name is Billie Garde. I'm a representative of the Citizens Association for Sound Energy. I'm also the director of the Government Accountability Project.

I think the presentation today was very clear. I also compliment Mr. Livermore for the concise and very simplified version of what must have been an extremely complex project that he and his team members have undergone. I think that it's too early for CASE's final position to be explained in this hearing, much as Mr. Spence, it's too early for you to make a complete feedback on what you're heard here.

I'm sure that those comments will be put in a letter which will be addressed to you, Mr. Eisenhut, or the

DAVbw

Commissioners.

I disagree -- and I think probably the main comments I want to make now are what you said about the need for a complete reinspection by an independent party. I know that Mr. Dircks and yourself, Mr. Eisenhut, have some fairly strong feelings after watching the reinspection efforts at Midland and Zimmer about what went wrong and what happened at those plants; however, the reinspection programs that were developed, a quality verification program at Midland and the quality construction program at Zimmer, also contained an awful lot of lessons, which I take, Mr. Spence, you and your professional staff should review, because those were comprehensive reinspections for plants that had, in some cases, not as serious problems as we've heard today.

I am right now involved in, shall we say, a line-by-line review of the reinspection efforts at those plants, as well as the NRC inspections of those plants, and comparing the findings of the TRT to the findings of the Special Inspection Team at Midland and the finding of the initial special inspection team, which was the two phases at Zimmer.

What I'm finding at this point is, that the problems at Comanche Peak, identified by this group, which is much larger and much more comprehensive than those two inspections were, have much more far reaching consequences.

DAVbw

My biggest concern for your company, Mr. Spence, is that you will jump in on a piecemeal approach and end up having to retrofit your reinspection for later findings.

I hope that you have stopped all safety-related work at the plant, although I haven' seen any documentation to that effect.

And I certainly hope that your program, as it's developed, includes at the very beginning, getting a handle on how many of your inspectors were actually qualified and trying to find the root cause of the qualification problems of both your craft and your quality control staff.

I'm concerned that any of the findings in your reinspection are given to the NRC with anything less than 10 proof. That is, that TugCo or TUEC does not come back with a programmatic response to a particular finding. If Mr. Livermore's team found 46 problems on 26 pipe supports or hangers, I do not think that CASE would believe it was acceptable to have a programmatic response. That is, this is what we intend to do in a reinspection effort, but that the results of that reinspection effort are given to the NRC on a regular basis, and hopefully, the public will be included in those types of meetings.

Mr. Noonan, you made the comment that you have nor received nay calls from QC inspectors since your meeting with them on the site. I think one of the things that you

DAVbw

may have failed to mention is, as you know, calls continue to come into the government accountability project and information has continued to be passed on to the TRT as those calls come in.

I will say, however, Mr. Spence, that since your company began to take more aggressive efforts in this area several months ago that the calls have been a lot less frequent and more far in between.

I am concerned that the TRT effort does not include, as of yet, a complete review of all of the historical documentation developed about this particular plant.

I don't know, if, for example, the TRT, based on what I've heard today, has reviewed the record of the proceedings and the testimony and affidavits, newspaper accounts, in some cases, of allegers who left the site even as far back as '76 and '77, with very detailed accounts of problems that they were finding. And I hope that that's one of the things that the TRT does.

I'm also not intimidated, but impressed, by the large group of consultants that you've brought with you this morning, to try to get a handle on the problems. I've worked with many of these people before and respect their credentials and their integrity. I hope that you realize that it's not going to be acceptable to have them in a

DAVbw

consultant role, giving advice to the people who were responsible for the plant for the last four or five years and let these problems happen, that in fact, the consultants are put in the position where their expertise can really be utilized by your company in finding the types of programmatic deficiencies that have resulted in your plant being virtually ready for fuel load with a large number of problems.

I'm particularly concerned -- and this is my closing comment -- Mr. Dircks, that you and Mr. Eisenhut reconsider your approach and your objectives to this company about needing a complete comprehensive reinspection. It should say enough to you that those rooms were locked and ready for fuel load, and that this company was aggressively pursuing low power license with the plant in the condition that it was in and promises of reform and promises of looking backwards at programmatic failures are not going to solve the problem that both the Board is going to need an answer to and that you should need an answer to, which is, what is the real condition of this plant and have all the problems been found?

The problems are not all going to be found until someone goes out and looks for that. That can only be done through a major comprehensive reinspection. And although, Mr. Spence, you have not taken a position on the type of

DAVbw

reinspection effort yet, I think that without the NRC's insisting on it, that we won't see that from your company.

I hope I'm wrong.

MR. EISENHUT: Let me assure both the Utility and the representative from the Intervenors, that it's going to take a lot more than promises and rhetoric from either the utility or from CAT and the Intervenors to sway us at this point.

We believe we do have a good handle on the technical problems. It's going to take a program that's aggressively pursued to resolve those.

On the other hand, if new information comes forth from allegers, it's going to have to be meaningful good information at this point, and we'll pursue it also.

I think that's on both sides of the puzzle, but we think we can handle it.

If there are no other comments, I want to thank you folks for coming in today.

We did wrap it a little bit sooner than I thought.

If as we go forth, you still have more detailed questions on a lot of the things we're doing, I do expect the Staff, quite a number of the Staff, will be down at the site to work on the plant. In fact, with the weather as it is here, I might even want to go back down on the site.

DAVbw

As I recall, the last time it was pretty warm. So thank you very much for coming today.

And thank you for the Staff, Herb and everyone else. I thought it was a very fine presentation.

(Whereupon, at 11:15 a.m., the meeting was adjourned.)

CERTIFICATE OF OFFICIAL REPORTER

This is to certify that the attached proceedings before the UNITED STATES NUCLEAR REGULATORY COMMISSION in the matter of:

NAME OF PROCEEDING: MEETING TO DISCUSS TECHNICAL REVIEW TEAM STAFF FINDINGS - COMANCHE PEAK

DOCKET NO.: 50-445-OL
50-446-OL

PLACE: WASHINGTON, D. C.

DATE: THURSDAY, JANUARY 17, 1985

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission.

(sigt) David L. Hoffman/sg

(TYPED)

DAVID L. HOFFMAN

Official Reporter

ACE FEDERAL REPORTERS, INC.

Reporter's Affiliation

TECHNICAL REVIEW TEAM BRIEFING

QUALITY ASSURANCE CONCERNS

JANUARY 17, 1985

INTRODUCTION

ROLE OF THE TRT

TRT REVIEW AREAS

- ELECTRICAL/INSTRUMENTATION
- CIVIL/MECHANICAL
- QA/QC
- COATINGS
- TEST PROGRAMS

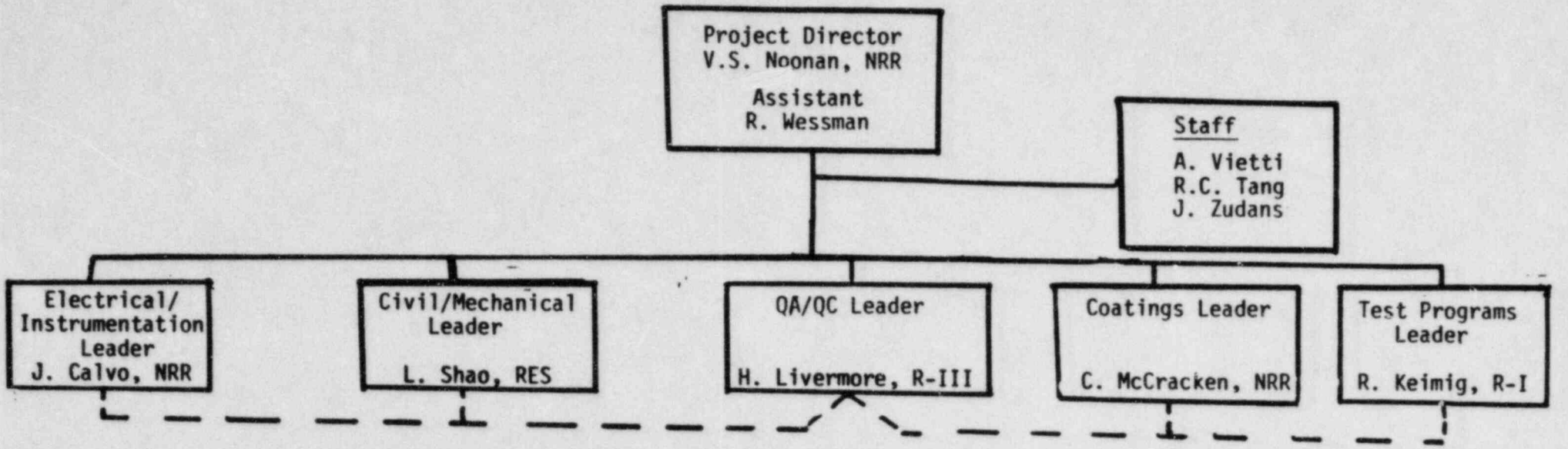
STATUS OF TRT REVIEW EFFORT

DISCUSSION OF QA/QC CONCERNS

TUGCO COMMENTS

CONCLUSION

TECHNICAL REVIEW TEAM (TRT)



- Technical Issues
- Allegations
- QA/QC Related to E, I&C

- Technical Issues
- Allegations
- QA/QC Related to Civil/Mech.

- Programmatic and Generic technical issues and allegations
- Integrate QA/QC from other groups
- Interface with other groups on QA/QC

- Technical Issues
- Allegations
- QA/QC Related to Coatings

- Technical Issues
- Allegations
- QA/QC Related to Test Programs

TYPICAL TRT INVESTIGATIVE ACTIONS

- APPLICANT RECORDS REVIEW
- INTERVIEWS WITH ALLEGERS
- REVIEW OF AFFIDAVITS AND DOCUMENTS PROVIDED BY ALLEGERS
- INTERVIEWS WITH APPLICANT AND B&R STAFF
- REVIEW OF DEPOSITIONS
- REVIEW OF OFFICE OF INVESTIGATIONS REPORTS
- REVIEW OF REGIONAL INSPECTION RECORDS
- INSPECTION OF PLANT SYSTEMS AND COMPONENTS
- AS-BUILT VERIFICATION PROGRAM
- FEEDBACK INTERVIEWS WITH ALLEGERS
- ASSESSMENT OF SAFETY SIGNIFICANCE

PROGRAM PLAN

- INCLUDE DETAILED PLANS AND SCHEDULES FOR ADDRESSING QA/QC ISSUES.
- ADDRESS ROOT CAUSE AND GENERIC IMPLICATIONS.
- ADDRESS COLLECTIVE SIGNIFICANCE OF DEFICIENCIES ON A PLANT THAT IS NEARLY COMPLETE.
- PROPOSE ACTIONS TO PREVENT RECURRENCE.
- CONSIDER USE OF MANAGEMENT PERSONNEL WITH FRESH PERSPECTIVE
- CONSIDER USE OF INDEPENDENT CONSULTANT TO PROVIDE OVERSIGHT

SUMMARY OF TRT FINDINGS

LIMITED TRT REVIEW INDICATES:

- EXAMPLES INDICATING CPSES NOT ALWAYS CONSTRUCTED IN ACCORDANCE WITH DESIGN REQUIREMENTS.
- FAILURE OF QC PROGRAM TO DETECT CONSTRUCTION ERRORS.
- FAILURE OF MANAGEMENT TO RECOGNIZE AND CORRECT THESE BASIC DEFICIENCIES.

SIGNIFICANT AREAS:

- MANAGEMENT COMMITMENT
- AS-BUILT DEFICIENCIES
- QC INSPECTION
- QC PERSONNEL QUALIFICATION AND TRAINING
- ONSITE FABRICATION
- DOCUMENT CONTROL

QA/QC OVERVIEW

- FIVE ONSITE SESSIONS OF TWO WEEKS EACH
- PERSONNEL - AT PEAK ACTIVITY 20 CONSULTANTS AND FOUR NRC INDIVIDUALS (ALL ENGINEERS), OVER 300 YEARS EXPERIENCE IN GENERAL ENGINEERING (NUCLEAR AND NON-NUCLEAR) INCLUDING QA/QC
- 124 ALLEGATIONS, ISSUES, CONCERNS
- CATEGORIES:
  - DESIGN PROCESS
  - DOCUMENT CONTROL
  - RECORDS
  - TRAINING/QUALIFICATION
  - REPAIR, REWORK, MAINTENANCE
  - ONSITE FABRICATION
  - HOUSEKEEPING
  - NCRs
  - MATERIALS
  - QC INSPECTION
  - QA SCOPE
- EARLY ASSESSMENTS IDENTIFIED SYMPTOMATIC QA/QC PROBLEMS NECESSITATING AN ADDITIONAL CATEGORY
  - AS BUILT

1. QUALITY ASSURANCE PROGRAM

- NO PERIODIC MANAGEMENT ASSESSMENT OF OVERALL EFFECTIVENESS OF THE QA PROGRAM
- AUDIT FUNCTION - UNDER STAFFED
- REPETITIVE NCRs WERE ISSUED INDICATING A NEED TO RETRAIN CONSTRUCTION PERSONNEL
- EXAMPLES OF INCOMPLETE AND INADEQUATE WORKMANSHIP AND INEFFECTIVE QC INSPECTION
- QC INSPECTORS WERE IN POSITIONS OF REVIEWING THEIR OWN WORK RECORDS
- 10 CFR 50.55(E) REPORTING SYSTEM DEFICIENCIES
- EXIT INTERVIEWS FOR DEPARTING EMPLOYEES WERE INADEQUATELY STRUCTURED AND INEFFECTIVE
- CORRECTIVE ACTION SYSTEM WAS POORLY STRUCTURED AND INEFFECTIVE

2. QC INSPECTION

- FUEL POOL LINER TRAVELER IRREGULARITIES:
  - PREENTERING "SAT" INSPECTION RESULTS
  - CHANGING INSPECTION DATES
  - QUESTIONABLE INSPECTOR SIGNATURES
  - CHANGED PROCEDURE NUMBER FOR ANOTHER INSPECTOR
  - CHANGED INSPECTION DATE FOR ANOTHER INSPECTOR
  - MISSING QC SIGNOFFS FOR STEP 1
  - MISSING SIGNATURES
- INADEQUATE DESCRIPTION OF RESOLUTION OF PIPE WHIP RESTRAINT WELD DEFECTS
- DEFICIENCIES IN LETTERS OF SEPT. 18 AND NOV. 29, 1984

3. T-SHIRT INCIDENT

4. INSPECTIONS OF AS-BUILT PIPE SUPPORTS & ELECTRICAL SUPPORTS

MECHANICAL

- FORTY-TWO PIPE SUPPORTS WERE INSPECTED BY TRT.
- FORTY-SIX DEFICIENCIES WERE IDENTIFIED ON TWENTY-SIX OF THE PIPE SUPPORTS.
- TYPES OF PIPE SUPPORT DEFICIENCIES INVOLVED:

  - PROCEDURE INADEQUACY
  - HARDWARE LOOSE OR MISSING
  - AS-BUILT DRAWING DID NOT MATCH INSTALLATION
  - COMPONENT IDENTIFICATION
  - WELDS
  - QC RECORDS
  - MATERIAL IDENTIFICATION

- SIX PIPE SUPPORT DEFICIENCIES HAD FREQUENT OCCURRENCE.

ELECTRICAL

- FIVE ELECTRICAL SUPPORTS WERE INSPECTED BY TRT.
- NINE DEFICIENCIES WERE IDENTIFIED ON THREE OF THE ELECTRICAL SUPPORTS.
- TYPES OF ELECTRICAL SUPPORT DEFICIENCIES INVOLVED:

  - HARDWARE
  - CONFIGURATION
  - WELDS

NOTE

ALL PIPE SUPPORTS AND ELECTRICAL RACEWAY SUPPORTS INSPECTED BY TRT HAD BEEN PREVIOUSLY ACCEPTED BY SITE QC.

Table 1

Pipe Supports – Unit 1

Supports Inspected by TRT As-Built group	* 42
Class 1	4
Class 2	14
Class 3	24
Hangers with nonconformances	26
Total deficiencies	46
Procedure adequacy	5
Hardware-related	16
As-Built	8
Component identification	2
Weld-related	10
QC record	1
Material IDENTIFICATION	4
Different types of deficiencies	25
Welds inspected without paint by TRT	305
Welds inspected with paint by TRT	89
Welds needing repair	10
Supports involving weld repair	6

* All 42 pipe supports inspected by TRT had been previously final QC accepted.

Table 1 (cont'd)

Pipe Supports – Unit 1

Bldg	System	Quantity Inspected
Containment	Safety Injection (SI)	1
Containment	Reactor Coolant (RC)	6
Containment	Residual Heat Removal (RHR)	2
Fuel Handling	Component Cooling (CC)	11
Safeguards	Residual Heat Removal (RHR)	1
Safeguards	Containment Spray (CT)	8
Safeguards	Demineralized Water (DD)	1
Safeguards	Auxilary Feedwater (AF)	8
Auxiliary	Chemical Volume & Control (CS)	1
Safeguards	Main Steam (MS)	2
Safeguards	Chilled Water (CH) (small bore)	1

Table 2
Pipe Supports Unit 1
Types of Deficiencies*

Deficiency	Hanger No.	# Deficiencies	Category
1 No locking device on threaded fasteners	RC-1-901-702-C82S CS-1-085-003-A42K	2	Hardware
2 Min. edge distance (on base plate) violated	CC-X-039-006-F43R	1	Hardware
3 Baseplate hole-location dimensions out of tolerance	CC-X-039-007-F43R CC-1-126-010-F33R CC-1-126-011-F33R CC-1-126-012-F33R	4	As-Built
4 Spherical bearing/washer gap excessive	CC-1-126-015-F43R RC-1-052-016-C41K RC-1-052-020-C41K MS-1-416-001-S33R	4	Hardware
5 Spherical bearing contamination	SI-1-090-006-C41K MS-1-416-002-S33R	2	Hardware
6 Snubber adapter plate-insufficient thread engagement	MS-1-416-002-S33R SI-1-090-006-C41K CT-1-013-012-S32K	3	Procedure
7 Insufficient threaded eng'mt, threaded rod (sight holes)	RC-1-901-702-C82S	1	Hardware

* All 42 pipe supports inspected by TRT had been previously final QC accepted.

Table 2 (cont'd)
Pipe Supports Unit 1
Categories of Problems*

Problem Category	Hanger #	# of Problems	Problem Type
8 Snubber/Strut load pin locking device broken or missing	AF-1-001-014-S33R	1	Hardware
9 Load side of pipe clamp halves not parallel	AF-1-001-001-S33R AF-1-001-014-S33R	2	Procedure
10 Pipe clearances w/support out of tolerance	CC-1-126-013-F33R AF-1-001-702-S33R	2	Hardware
11 Pipe clamp locknut loose	AF-1-035-011-S33R	1	Hardware
12 Snubber/sway strut misalignment	CC-1-126-014-F43R RC-1-052-020-C41R	2	Hardware
13 Snubber cold set dimension does not match drawing	CS-1-085-003-A42K	1	As-Built
14 Snubber orientation does not match drawing	CT-1-005-004-S22K CT-1-013-010-S22K	2	As-Built
15 Component type/model # installed does not match drawing	SI-1-090-006-C41K RC-1-052-020-C41R	2	Component ID
16 NO IDENTIFICATION FOR SUPPORT MATERIALS, PARTS, AND COMPONENTS	CT-1-013-014-S32R CC-1-126-012-F33R CC-X-039-005-F43R AF-1-035-011-S33R	4	Matl. ID

* All 42 pipe supports inspected by TRT had been previously final QC accepted.

Table 2 (cont'd)
Pipe Supports Unit 1
Types of Deficiencies*

	Deficiency	Hanger No.	# Deficiencies	Category
17	BRP column line dimension does not match BRHL dimension	Support not affected	1	As-Built
18	Weld porosity excessive	AF-1-001-001-S33R	1	Weld-related
19	Weld undercut excessive	AF-1-001-702-S33R	1	Weld-related
20	Weld length undersized	AF-1-001-001-S33R	1	Weld-related
21	Weld leg or effective throat undersized	AF-1-001-001-S33R RH-1-006-012-C42R CC-X-039-007-F43R	3	Weld-related
22	Weld called out on drawing does not exist in field	CC-1-126-013-F33R	1	Weld-related
23	Welds added in field are not reflected on drawing	AF-1-001-702-S33R numerous welds	1	Weld-related
24	Excessive grinding resulting in min. thickness violations (weld clean-up)	AF-1-037-002-S33R CT-1-013-014-S32R	2	Weld-related
25	No QC buy-off on weld data card	CC-1-126-013-F33R	1	QC Record
			46	Total Problems identified by TRT

* All 42 pipe supports inspected by TRT had been previously final QC accepted.

Table 3

Summary of Field Review of Pipe Support Welds

Total number of pipe supports inspected	* 42
Number of supports requiring weld repair	6
Percent of total inspected requiring repair	14%
Total welds inspected on 42 supports	394
Number of inspected welds which require repair	10
Number of welds repaired (as of Oct. '84) on the 6 defective supports	9
Welds requiring repair, percent of total welds inspected	2.5%

* All 42 pipe supports inspected by TRT had been previously final QC accepted

Table 4

Summary of Additional Support Inspections

Area: Room 77N, Elevation 810′-6″ Unit #1, Safeguards Building

Deficiency	No. of Supports Inspected	No. of Supports Deficient	% Deficient
Excessive Spherical Bearing Clearance	92	5	5.4%
Load Pin Locking Device Missing	92	14	15.2%
Pipe Clamp Halves Not Parallel	40	9	22.5%
Snubber Adapter Plate Bolts With Less Than Full Thread Engagement	19	* 13	To Be Determined

* Bolts had less than full thread engagement.

Table 5

Summary of Additional Support Inspections

Area: Cable Spread Room 133, Elevation 807'-0" Unit #1, Auxiliary Building

Deficiency	Bolts Inspected	# Deficient	% Deficient
Hilti Kwik Bolt Does Not Meet Minimum Embedment**	24	3	12.5%

** Taking into account the "allowed" slippage of the bolt for a distance of one nut thickness due to the torquing and the minimum specified embedment, the above Hilti bolts violated the "effective" embedment requirements. (Ref. "Installation of 'Hilti' Drilled-In Bolts" 35-1195-CEI-20, Rev. 3, Para. 3.1.4.1)

Table 6

Summary of Electrical Support Inspection – Unit #1

Support welds inspected	59
Supports inspected by TRT As-Built Group	5
Supports with problems (3/5 = 60%)	3
Supports accepted (2/5 = 40%)	2

Types of Deficiencies

Hardware-related, other than welding	6
Unauthorized configuration change	1
Weld-related types of problems (categories)	2
Welds requiring rework	41
Welds made in field but not recorded on drawing	80
Beam stiffeners added but not recorded on drawing	40

Building/Area	Supports
Cable Spread Room	CTH 12646 C 130-21-250-3 C 120-21-194-3
Auxiliary Building	CTH 6742
Containment	CTH 5824

Table 7

Summary of General Types of Deficiencies (pipe supports and/or electrical supports)

- Undersize welds
- Weld undercut and porosity
- Weld insufficient fill and surface
- Grinding of base metal material
- Excess welds not shown on drawing
- Absence of QC weld buy-offs
- Insufficient thread engagement
- Absence of locking devices
- Minimum edge distance violation
- Excessive gap in spherical bearing interfaces - strut and snubber
- Shock arrester model numbers do not match drawings

Table 7 (cont'd)

Summary of General Types of Deficiencies (pipe supports and/or electrical supports)

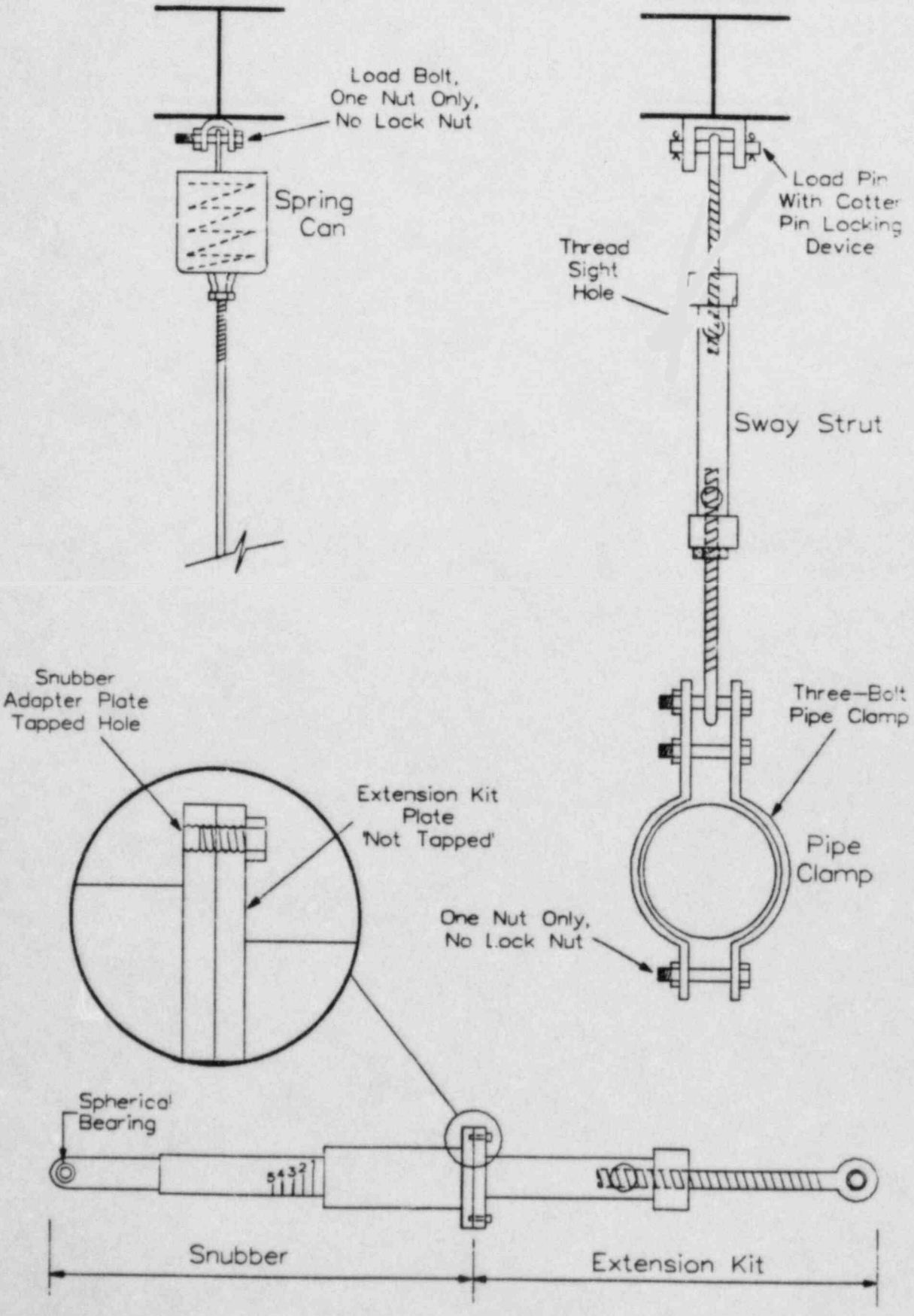
- Component support bolt holes out of location
- Spherical bearing contamination
- Thread engagement not verified
- Pipe clamp halves not parallel
- Pipe clearance with supports out of tolerance
- Loose pipe clamp locknuts
- Snubber/sway strut misalignment
- Snubber cold set out of tolerance
- Snubber orientation not on drawing
- Electrical hanger welds not on drawing
- Beam stiffeners not shown on drawing
- Material IDENTIFICATION LACKING

TABLE 8

TRT CONCLUSIONS ON AS-BUILT EFFORT

1) QC INSPECTIONS ARE INEFFECTIVE
2) CRAFT CONSTRUCTION IS FAULTY
3) HARDWARE IS NOT PER AS-BUILT DRAWINGS
4) HARDWARE POTENTIALLY NOT REPRESENTED CORRECTLY IN THE FINAL STRESS ANALYSIS

Figure 1. Hardware Examples



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5. DOCUMENT CONTROL

- POTENTIAL EXISTS FOR THE DCC SATELLITES TO ISSUE DEFICIENT DOCUMENT PACKAGES TO CRAFT PERSONNEL

- DRAWING CONTROL INADEQUATE PRIOR TO JULY 1984

  - RECURRING DEFICIENCIES IDENTIFIED BY INTERNAL AND EXTERNAL AUDITS BETWEEN SEPTEMBER 1981 TO AUGUST 1983

  - FIELD DISTRIBUTION CHANGED FROM FILE CUSTODIANS TO SATELLITES

  - RECURRING DEFICIENCIES CONTINUED FROM AUGUST 1983 TO APRIL 1984

  - TREND REVERSED WHEN TOP MANAGEMENT PARTICIPATED IN CORRECTIVE ACTION PROCESS

- PROCEDURES GOVERNING 10 CFR 50.55(E) DEFICIENCY REPORTING INADEQUATE

- CONSIDERATION OF REPORTING CYGNA AUDIT FINDINGS TO NRC

- DCC CONTROL COPY STAMPS NOT ADEQUATELY PROCEDURALIZED

6. TRAINING/QUALIFICATION

- TWENTY PERCENT OF THE TRAINING RECORDS REVIEWED CONTAINED NO VERIFICATION OF EDUCATION OR WORK EXPERIENCE
- RESULTS OF LEVEL I CERTIFICATION TESTS USED FOR SOME LEVEL II CERTIFICATIONS
- AFTER FAILING A CERTIFICATION TEST, A CANDIDATE COULD TAKE THE IDENTICAL TEST AGAIN.
- CERTIFICATIONS NOT ALWAYS SIGNED OR DATED
- WHITE-OUT USED ON CERTIFICATION TESTS
- SEVEN INSPECTORS HAD QUESTIONABLE QUALIFICATIONS
- NO LIMIT OR CONTROL ON THE NUMBER OF TIMES AN EXAMINATION COULD BE TAKEN
- NO GUIDELINES FOR THE USE OF WAIVERS FOR ON-THE-JOB TRAINING
- RECERTIFICATION WAS ACCOMPLISHED BY A SIMPLE "YES" FROM A SUPERVISOR
- NO FORMAL ORIENTATION TRAINING FOR DCC PERSONNEL PRIOR TO AUGUST 1983
- RESPONSIBILITY FOR ADMINISTRATION OF THE NON-ASME TRAINING PROGRAM NOT CLEARLY ASSIGNED TO A SINGLE INDIVIDUAL OR GROUP
- NON-ASME PERSONNEL CAPABILITIES LOOSELY DEFINED BY LEVELS (I, II, III)
- EXEMPTION PROVISION IN ANSI N45.2.6, WHICH ALLOWED SUBSTITUTION OF PREVIOUS EXPERIENCE OR DEMONSTRATED CAPABILITY, WAS THE <u>NORMAL</u> METHOD FOR QUALIFYING INSPECTION PERSONNEL RATHER THAN THE EXCEPTION
- ADDITIONAL PROBLEMS IN NON-ASME CERTIFICATION TESTING
  - NO REQUIREMENT FOR ADDITIONAL TRAINING BETWEEN A FAILED TEST AND THE RETEST
  - NO TIME LIMITATION BETWEEN A FAILED TEST AND A RETEST
  - TWO DIFFERENT SCORING METHODS TO GRADE TESTS
  - NO GUIDELINES ON HOW A TEST QUESTION SHOULD BE DISQUALIFIED
  - NO PROGRAM FOR PERIODICALLY ESTABLISHING NEW TESTS EXCEPT WHEN PROCEDURES CHANGE.
  - NO DETAILS ON HOW THE ADMINISTRATION OF TESTS SHOULD BE MONITORED

7. VALVE INSTALLATION

- THERE WAS A LACK OF CONTROL TO PREVENT THE LOSS, DAMAGE, AND INTERCHANGE OF PARTS WHEN VALVES WERE DISASSEMBLED PRIOR TO WELDING THE VALVE BODY IN THE LINE (PIPING INSTALLATION)

8. ON SITE FABRICATION (IRON FAB SHOP)

- SCRAP AND SALVAGE IN LAYDOWN YARD WAS NOT IDENTIFIED AND DID NOT HAVE RESTRICTED ACCESS
- INDETERMINATE BULK MATERIALS MINGLED WITH CONTROLLED SAFETY AND NON-SAFETY MATERIALS IN LAYDOWN YARD
- MATERIAL REQUISITIONS DID NOT COMPLY WITH THE APPLICABLE PROCEDURES
- SHOP FOREMEN NOT FAMILIAR WITH THE PROCEDURES THAT CONTROLLED THE WORK UNDER THEIR RESPONSIBILITIES
- FABRICATION AND INSTALLATION PROCEDURES DID NOT INCLUDE INFORMATION TO ENSURE THAT B & R FABRICATED THREADS CONFORMED TO DESIGN SPECFICIATIONS OR TO AN APPLICABLE STANDARD
- QC SITE SURVEILLANCES OF MATERIAL STORAGE NOT DOCUMENTED
- WORK IN FAB SHOP PERFORMED IN RESPONSE TO MEMOS AND SKETCHES INSTEAD OF HANGER PACKAGES, TRAVELERS AND CONTROLLED DRAWINGS

9. HOUSEKEEPING AND SYSTEM CLEANLINESS

- SWIPE TESTS ON REACTOR VESSEL
  - PROCEDURE FP-55-08 REQUIRES TWO SWIPE TESTS ON THE REACTOR VESSEL
  - THE TRT QUESTIONS THE ADEQUACY OF ONLY TWO TESTS TO ASSURE THE CLEANLINESS OF THE VESSEL
- PROTECTIVE COVERINGS
  - WELDING ACTIVITY ADJACENT TO SNUBBERS NOT COVERED WITH A PROTECTIVE DEVICE
  - POTENTIAL VIOLATION OF PROCEDURE CP-CPM-14.1

10. NONCONFORMANCE REPORTS (NCRs)

- USE OF APPROXIMATELY 40 DIFFERENT FORMS FOR RECORDING DEFICIENCIES
- INADEQUATE INSTRUCTIONS FOR HANDLING VOIDED NCRs
- USE OF NCRs AS A TRACKING DOCUMENT NOT DEFINED IN PROCEDURES
- INCONSISTENCY IN REPORTING OF NONCONFORMANCES
- CONTROL OF OBSOLETE NCR FORMS
- TWO TUGCO NCR FORMS IN USE BY CONSTRUCTION
- NO IDENTIFICATION OF CAUSE OF NONCONFORMANCE OR STEPS TO PREVENT RECURRENCE
- NO EVIDENCE OF QUALITY ASSURANCE MANAGEMENT INVOLVEMENT

11. MATERIALS

- PIPE SUPPORT MATERIAL TRACEABILITY FAILURE PRIOR TO OCTOBER 1981
- PROBLEM IDENTIFIED IN ASME CODE SURVEY
- FAILED TO REPORT QA BREAKDOWN AS PER 10 CFR 50.55(E)

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

January 8, 1985

Docket Nos. 50-445/446

Mr. M. D. Spence, President
Texas Utilities Generating Company
400 North Olive Street
Lock Box 81
Dallas, Texas 75201

Dear Mr. Spence:

Subject: Comanche Peak Review

On July 9, 1984, the Comanche Peak Technical Review Team (TRT) began an intensive onsite effort to complete a portion of the reviews necessary for the NRC staff to reach its decision regarding the licensing of Comanche Peak Unit 1. The onsite effort covered a number of areas, including the review of allegations of improper construction practices at the facility.

On September 18, 1984, the NRC met with you and other Texas Utilities Electric Company representatives to provide you with a request for additional information in the electrical and instrumentation, civil and structural, and test program areas having potential safety implications. On November 29, 1984, we reported to you on the status of our technical review in the protective coatings area and requested additional information in the mechanical, and miscellaneous areas. TRT reviews of construction QA/QC allegations and technical issues have progressed to the point where we can now provide you with the status of our efforts in the construction QA/QC area and a request for a program plan specifically addressing our concerns. Further background information regarding these allegations and technical issues will be published in Supplements to the Comanche Peak Safety Evaluation Report (SSER), which will document the TRT's detailed assessment of the significance of all issues examined.

The TRT effort constitutes one element in the process of the agency's review of the Comanche Peak license application. The QA review group on the TRT was comprised of about 20 individuals having a total of over 300 years experience in nuclear engineering, QA, and related fields. This group spent several months at the Comanche Peak site examining the construction QA program in depth.

The TRT findings are provided in the enclosure to this letter. We have not proposed specific TUEC corrective actions as we have in previous reports from the TRT. We request that you evaluate the TRT findings and consider the implications of these findings on construction quality at Comanche Peak. We request that you submit to the NRC, in writing, a program and schedule for completing a detailed and thorough assessment of the QA issues presented in the enclosure to this letter.

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Your programmatic plan and the plans for its implementation will be reviewed and evaluated by the staff before NRC considers the issuance of an operating license for Comanche Peak Unit 1. The TRT considers the construction QA/QC findings to be generic to both Units 1 and 2 and your program plan and schedule should address both units. This program plan shall: (1) address the root cause of each finding and its generic implications on safety-related systems, programs, or areas, (2) address the collective significance of these deficiencies, and (3) propose an action plan from TUEC that will ensure that such problems do not occur in the future. Your actions should consider the use of management personnel with a fresh perspective to evaluate the TRT's findings and implement your corrective actions. Finally, you should consider the use of an independent consultant to provide oversight to your program.

The findings of TRT with respect to QA/QC allegations, along with the TRT's assessments of your response to this letter, will be provided to the Senior Management Panel on Contention 5 established by the Executive Director on December 24, 1984. The Senior Management Panel will determine an overall NRC staff position on Contention 5 based on an integrated review of a number of sources of information concerning QA/QC at Comanche Peak in addition to the TRT findings, including information from the CAT team, the SRT team, OI, Region IV and the Hearing Board.

The TRT's overall evaluation of the technical issues and allegations is nearing completion. As we finalize information received in conversations with allegers, and further assess the implications of our findings we will inform you of additional concerns, as they arise. In the mean time, your examination of the potential safety implications of the TRT findings should include, but not be limited to the areas or activities selected by the TRT.

In order to fully discuss these concerns with you we are scheduling a meeting for January 17, 1985 which will be held in our office in Bethesda, Maryland. This meeting will provide an opportunity to ask questions regarding these concerns prior to formulating your program plan. Additional meetings will be held at NRC request as your program plan is formulated.

This request is submitted to you in keeping with the NRC practice of promptly notifying applicants of outstanding information needs that could potentially affect the safe operation of their plant. Future requests for information of this nature will be made, if necessary, as TRT technical reviews continue.

Sincerely,

Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation

Enclosure: As stated

cc w/enclosure:
See next page

COMANCHE PEAK

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Enclosure

Technical Review Team Findings Resulting From
Quality Assurance/Quality Control Allegations

In evaluating the QA/QC program at CPSES, the Technical Review Team (TRT) completed the following: (1) interviewed Texas Utilities Electric Company (TUEC) and Brown & Root (B&R) personnel and allegers, (2) reviewed quality assurance records, selected affidavits, transcripts and depositions, and NRC Regional and Office of Investigations reports, and (3) physically inspected hardware to evaluate the safety significance of quality assurance/quality control (QA/QC) allegations at Comanche Peak Steam Electric Station (CPSES).

1 QUALITY ASSURANCE PROGRAM

The TRT found that although the TUEC QA program documentation met NRC requirements, the weaknesses of its implementation in several areas demonstrate that TUEC lacked the commitment to aggressively implement an effective QA/QC program in several areas:

A. TUEC failed to periodically assess the overall effectiveness of the site QA program in that there have been no regular reviews of program adequacy by senior management. Further, TUEC did not assess the effectiveness of its QC inspection program.

B. During the peak site construction period of 1981-2, TUEC employed only four auditors, all of whom had questionable qualifications in technical disciplines. Although charged with overview of all site construction and associated vendors, these Dallas based auditors provided only limited QA surveillance of construction activities.

C. Repetitive NCRs were issued that identified the need to retrain construction personnel in the requirements and contents of QA procedures. One corrective action request (CAR) dealing with inadequate construction training and records remained open for one year. The identical problem was identified in a subsequent CAR, which still had not been closed at the time of the TRT's onsite review.

D. The TRT found many examples of incomplete and inadequate workmanship and ineffective QC inspection in TUEC's evaluation of the as-built program. (See Section 4 for a detailed discussion.)

E. Some craft workers newly assigned as QC inspectors were in a position to inspect their own work and records. Site management did not view this lack of separation between production and inspection roles as a potential conflict-of-interest.

F. There were potential weaknesses in the TUEC 10 CFR 50.55(e) deficiency-reporting system. Applicable procedures did not identify what types

of deficiencies constituted significant breakdowns in the QA program, nor how they should be evaluated for reportability to the NRC. Evaluation guidelines for reporting hardware deficiencies lacked clarity and definitive instructions and the threshold for reporting deficiencies was too high. Specific past and present construction deficiencies that were not reported by TUEC are listed in Sections 4, 5 and 11 of this enclosure.

G. The TUEC exit interview system for departing employees appeared to be neither well structured nor effective, as evidenced by the lack of employee confidence, limited implementation, failure to document explanations and rationale, and failure to complete corrective actions and to determine root causes.

H. The B&R corrective action system was generally ineffective and was bypassed by the B&R QA Manager, as exemplified in the following instances:

1. There were no definitive instructions to describe the types of problems that required corrective action. Minimal procedural instructions resulted in corrective action decisions frequently being left to the judgement of the QA Manager.

2. Since June 1983, B&R had issued no Corrective Action Requests (CARs), and was substituting memos and letters of concern for this function. This shortcut had become a regular method of operation and appeared to bypass the CAR system.

I. The TUEC corrective action system was poorly structured and ineffective in that:

1. Controlling procedures were brief and general.

2. There was no translation of FSAR requirements on trending and no details on how trend analyses were to be accomplished.

3. Quarterly reports were not issued in a timely manner.

4. The method of categorizing problems by building did not assure meaningful trend analysis.

5. A 1984 CAR report identified three items requiring action; however, none had been taken.

6. CAR 029 was used as a vehicle for a specific disposition rather than for generic action, as intended by the CAR system.

2 QUALITY CONTROL INSPECTION

The TRT evaluated the CPSES QC program to determine if it was functionally effective and if the QC system and organization effectively ensured consistent quality of design, procedures, processes and product at the plant. The results of this review showed the following problems.

A. Based on the TRT review of about 200 fuel pool travelers, TUEC was unable to maintain an effective and controlled QC program for fuel pool liner fabrication, installation, and inspection. Typical fuel pool traveler irregularities were:

1. There was apparently a routine practice during construction of the fuel pool that allowed craft personnel to complete a portion of the inspection report forms prior to the actual inspection. Craft personnel entered the word "SAT," dated the entry, and left blank only the space for the QC inspector's signature. It appeared that the craft personnel were judging the inspection results prior to inspections.

2. The date accompanying the signature for visual examination of an inside weld was changed to a date that appeared to precede the examination.

3. Entries by the same inspector for two different inspections did not appear to match in that one entry appeared to be written by another person.

4. The procedure number for a dye penetrant inspection was changed by an inspector different from the one who conducted the inspection.

5. The date for a dye penetrant inspection was changed by an inspector other than the one who performed the inspection.

6. Fuel pool travelers were found with missing QC signoffs for fitup and cleaniness. No proof could be found that some of the required weld fitup and cleanliness inspections were ever performed.

7. The TRT review disclosed the following irregularities with traveler entries in addition to those listed above:

   (a) Date changes after the fact
   (b) Signoffs for functions out of sequence
   (c) Corrections after the fact
   (d) Changes to first party inspector date signoffs
   (e) Missing signatures

B. There were examples of limited corrective action, including vendor-supplied pipe whip restraints that had received inadequate source inspections. Twelve NCRs were issued involving weld defects on these restraints. TUEC corrective action included paint removal from only a sample of the welds and 21 restraints were selected for reanalysis; however, the TRT found no basis or criteria for paint removal or how the worst case restraints were identified.

The reviews of allegations in the Civil and Structural, Coatings, Electrical, Test Programs, and Piping and Mechanical areas also indicate QC inspection deficiencies, as provided in our letters of September 18, and November 29, 1984.

3 T-SHIRT INCIDENT

The T-shirt incident has previously been explored in many forums, including hearings before the Atomic Safety and Licensing Board. The TRT has examined this matter, but will not now describe all of the associated issues. Importantly, however, the TRT believes that TUEC management failed to adequately investigate the incident to determine its root cause, but reacted as though the QC inspectors involved were guilty of disruptive behavior. Of particular concern to the TRT is the strong perception that TUEC QA management may have acquiesced to pressures and complaints from construction personnel and may have failed to adequately support their QC workforce.

4 INSPECTIONS OF AS-BUILT PIPE AND ELECTRICAL RACEWAY SUPPORTS

The TRT conducted a series of inspections encompassing as-built safety-related pipe support and electrical raceway support installations. These inspections were of completed systems or components that had been previously inspected and accepted by TUEC QC as meeting the respective construction and installation requirements.

A. Pipe Support Inspections

Tables 1 and 2 are indicative of the scope of the TRT pipe support as-built inspection effort. Of the 42 pipe supports inspected, 37 were randomly selected, while 5 originated from an alleger's list. Forty-six deficiencies were identified in the supports inspected. Following are examples of the deficiencies identified and the applicable criteria. TUEC's final QC inspections of this sample ranged from December 1982 to October 1984.

1. Component Support Welds:

(a) Applicable criteria

ASME Section III, NF Subsection and subarticles NF-4424 and NF-5360 set forth rules for examining welds.

B&R QI-QAP-11.1-28 Revision 25, Paragraph 3.5.5.1 delineates criteria for the examination of welds, including inspection parameters for acceptable weld sizes.

The TRT found supports exhibiting welds that did not appear to be in accordance with the above-referenced codes and procedures.

(b) Examples of deficient welds

(1) Support No. AF-1-001-001-S33R. Discrepancies included porosity; insufficient weld leg; incomplete welds and insufficient fill. This support was removed, scrapped, and completely rebuilt subsequent to the TRT inspection.

Table 1 Pipe supports in unit 1

Supports Inspected by TRT As-Built group	*42
Class 1 supports inspected	4
Class 2 supports inspected	14
Class 3 supports inspected	24
Hangers with problems	26
Total problems identified	46
Procedure adequacy problems	5
Hardware-related problems	16
As-built drawing related problems	8
Component identification problems	2
Weld-related problems	10
QC record problems	1
Material identification problems	4
Welds inspected without paint by TRT	305
Welds inspected with paint by TRT	89
Total welds inspected by TRT	394
Welds needing weld repair	10
% of welds inspected	2.5%
Supports needing welding repair	6
% of supports inspected	14%

Bldg	System	No. of Supports Inspected
Containment	Safety Injection (SI)	1
Containment	Reactor Coolant (RC)	6
Containment	Residual Heat Removal (RHR)	2
Fuel Handling	Component Cooling (CC)	11
Safeguards	Residual Heat Removal (RHR)	1
Safeguards	Containment Spray (CT)	8
Safeguards	Demineralized Water (DD)	1
Safeguards	Auxiliary Feedwater (AF)	8
Auxiliary	Chemical Volume & Control (CS)	1
Safeguards	Main Steam (MS)	2
Safeguards	Chilled Water (CH)	1

*All 42 pipe supports inspected by the TRT had been previously accepted by site QC.

Table 2 Pipe supports in unit 1*

Problem Category	Hanger No.	No. of Problems	Type
1. No locking device for threaded fasteners	RC-1-901-702-C82S CS-1-085-003-A42K	2	Hardware problem
2. Min. edge distance (on base plate) violated	CC-X-039-006-F43R	1	Hardware prob.
3. Baseplate hole-location dimensions out of tolerance	CC-X-039-007-F43R CC-1-126-010-F33R CC-1-126-011-F33R CC-1-126-012-F33R	4	As-Built prob.
4. Spherical bearing/washer gap excessive	CC-1-126-015-F43R RC-1-052-016-C41K RC-1-052-020-C41K MS-1-416-001-S33R	4	Hardware prob.
5. Spherical bearing contamination	SI-1-090-006-C41K MS-1-416-002-S33R	2	Hardware prob.
6. Snubber adapter plate-insufficient thread engagement	MS-1-416-002-S33R SI-1-090-006-C41K CT-1-013-012-S32K	3	Proced. prob.
7. Insufficient threaded eng'mt, threaded rod (sight holes)	RC-1-901-702-C82S	1	Hardware prob.
8. Snubber/Strut load pin locking device broken or missing	AF-1-001-014-S33R	1	Hardware prob.
9. Load side of pipe clamp halves not parallel	AF-1-001-001-S33R AF-1-001-014-S33R	2	Proced. prob.
10. Pipe clearances w/support out of tolerance	CC-1-126-013-F33R AF-1-001-702-S33R	2	Hardware prob.
11. Pipe clamp locknut loose	AF-1-035-011-S33R	1	Hardware prob.

*All 42 pipe supports inspected by TRT had been previously accepted by site QC.

Table 2 (Continued) Pipe supports in unit 1*

Problem Category	Hanger No.	No. of Problems	Type
12. Snubber/Sway strut misalignment	CC-1-126-014-F43R RC-1-052-020-C41R	2	Hardware problem
13. Snubber cold set dimension does not match drawing	CS-1-085-003-A42k	1	As-Built prob.
14. Snubber orientation does not match drawing	CT-1-005-004-S22K CT-1-013-010-S22K	2	As-Built prob.
15. Component type/model no. installed does not match drawing	SI-1-090-006-C41K RC-1-052-020-C41R	2	Compon. ID prob.
16. No identification for support materials, parts, and components	CT-1-013-014-S32R CC-1-126-012-F33R CC-X-039-005-F43R AF-1-035-011-S33R	4	Matl. identific. prob.
17. BRP column line dimension does not match BRHL Dimension	Support not affected	1	As-Built prob.
18. Weld porosity excessive	AF-1-001-001-S33R	1	Weld-related prob.
19. Weld undercut excessive	AF-1-001-702-S33R	1	Weld-related prob.
20. Weld length undersized	AF-1-001-001-S33R	1	Weld-related prob.
21. Weld leg or effective throat undersized	AF-1-001-001-S33R RH-1-006-012-C42R CC-X-039-007-F43R	3	Weld-related prob.
22. Weld called out on drawing does not exist in field	CC-1-126-013-F33R	1	Weld-related prob.
23. Welds added in field are not reflected on drawing	AF-1-001-702-S33R numerous welds	1	Weld-related prob.
24. Excessive grinding resulting in min. thickness violations (weld clean-up)	AF-1-037-002-S33R CT-1-013-014-S32R	2	Weld-related prob.
25. No QC Buy-off on weld data card	CC-1-126-013-F33R	1	QC record problem
		46	Total problems identified by TRT

*All 42 pipe supports inspected by TRT had been previously accepted by site QC.

(2) Support No. AF-1-001-702-S33R. Exhibited extraneous welding that was not documented on the as-built drawing. One of the required welds was undercut beyond the limits of acceptance (this weld was subsequently repaired).

(3) Support No. CC-1-126-013-F33R. Support drawing required a 1/4" fillet weld to connect item 5 to item 6. This weld was omitted in the field.

(4) Support No. CC-X-039-007-F43R. A required 5/16" all-around fillet weld had an approximately 1/16" undersize weld leg for the length across the top flat of the tube steel.

(5) Support No. RH-1-006-012-C42R. An all-around 1/4" fillet weld connecting item 5 to item 7 was undersized by 1/32" to 1/16" across the top.

(6) Support No. AF-1-037-002-S33R. This support exhibited a 1/16" to 3/32" reduction in plate thickness and weld size due to excessive grinding of the weld at the base plate. Base material thickness of the support plate was reduced beyond the limits of acceptance in three locations.

(7) Support No. CT-1-013-014-S32R. Excessive overgrinding of welds resulted in notching of the sway strut rear brackets. This condition was repaired subsequent to the TRT inspection.

2. Locking Device for Threaded Fasteners:

(a) Applicable criteria

Subarticle NF-4725 states in part that all threaded fasteners, except high-strength bolts, shall be provided with locking devices to prevent loosening during service.

ASME Sect. III, Div. 1, Interpretation No. III-1-83-49R provides that the user should satisfy himself that any other device than those described in NF-4725 is capable of acting as a locking device under all service conditions.

Brown & Root Procedure QI-QAP-11.1-28, Attachment 2, Operation 7, Inspection Attribute h., requires that all exposed threads be free of extraneous material.

CPSES/FSAR, Paragraph 17.1.2 states that the design verification procedure assure that drawings, specifications, procedures, and instructions meet stipulations of related codes and standards.

10 CFR 50.55(e)(1) directs that the holder of the construction permit shall notify the NRC regarding each deficiency found in design and construction which, if not corrected, could adversely affect the safety of operations at any time throughout the expected lifetime of the plant.

There appeared to be a difference in locking devices on threaded fasteners for similar pipe support hardware made by two separate vendors. Whereas in some cases Nuclear Power Service Incorporated (NPSI) specified only one nut and no locking device, ITT-Grinnell required two nuts in those same applications. If the design of NPSI models indeed should be found to need the locknuts or their equivalent, there could be hundreds of pipe supports installed without adequate locking devices.

The TRT found examples in Unit 1 where deficiencies existed so that TUEC was in potential violation of the codes, procedures, guidelines, and commitments concerning locking devices for threaded fasteners. In spite of the requirements pursuant to 10 CFR 50.55(e)(1), TUEC did not report to the NRC the omission of thread-locking devices in the Unit 1 nuclear safety systems and did not attempt corrective action until May 1984, when TUEC tested previously applied paint for thread-lock capability. That test was inconclusive, since it did not establish that the paint, an epoxy process, would reliably perform as an effective locking device under all service conditions and throughout the expected lifetime of the plant. Further, TUEC could not identify to the TRT which paint was the subject of testing.

TUEC had a potentially inadequate quality assurance specification No. 2323-AS-31, which did not cover inspection of painted threaded fasteners. The paint was applied to ASME code-controlled, NF hardware per specification 2323-AS-30 (non-Q) which required no inspection. This issue appears to be generic for Unit 1.

The TRT notes that TUEC did not initiate an NCR identifying the widespread problem of missing locknuts; only a Request for Information was generated, which TUEC could not locate for the TRT. An NCR, required by procedure, would have brought the problem and its ramifications to management attention and would have provided a vehicle for controlled, organized, and approved engineering disposition.

(b) Examples of deficient locking devices.

Pipe support RC-1-901-702-C82S had a load bolt at a beam attachment which did not exhibit an approved locking device. (The bolt material type was SA-307 grade A.) Additionally, pipe support CS-1-085-003-A42K had no approved locking device on the "special clamp" bolts, even though the design drawing for this clamp showed each bolt with a nut and a locknut.

3. Minimum Edge Distance for Bolts:

(a) Applicable criteria

- QI-QAP 11.1-28 Revision 19, Paragraph 6.1 required that bolt holes in structural members shall not be closer than 1-1/2 times the bolt diameter from the edge of the member to the center of the bolt hole.

ASME Sect. III Div. 1, Subsection NA, Appendix XVII, Table XVII-2462-1(b)-1, gives specifically allowed minimum edge distances for bolt holes (reamed, punched or drilled) at sheared or rolled edges of plates, shapes, or bars.

(b) Example of minimum edge distance violation

- The baseplate for pipe support CC-X-039-006-F43R, located in the component cooling system, Room 249A, Fuel Handling Building, violated minimum edge distance criteria for bolt holes.

4. Base Plate Hole-Location Dimensions:

(a) Applicable criterion

QI-QAP-11.1-28, Revision 19, Attachment 4, Paragraph 2, under fabrication tolerances, limits a "hole centerline location to ±1/4" or as shown on the design drawing."

(b) Examples of hole-location dimension problems

The TRT found the horizontal member of Support CC-1-126-010-F33R was 3 inches lower at its centerline relative to the upper bolt-hole centerline than shown on the vendor-certified drawing. The as-built drawing had not been revised to reflect the actual installed condition in the plant. This support was located in the component cooling system, Room 247A, in the Fuel Handling Building. Other supports with similar hole-location violations found in the inspections were: CC-X-039-007-F43R, CC-1-126-011-F33R, and CC-1-126-012-F33R.

5. Spherical Bearing Gap:

(a) Applicable criterion

Brown & Root Procedure, QI-QAP 11.1-28, Revision 25 paragraph 3.7.3.1 states that "a sufficient number of spacers shall be used to prevent the spherical bearings from becoming dislodged," and "in no case shall the resulting gap be more than the thickness of one vendor-supplied spacer."

(b) Examples of spherical bearing gap deficiencies

An excessive free gap existed between spherical bearing and washers on the sway strut assembly of support CC-1-126-015-F43R. Other supports with similar bearing gap anomalies found in TRT's inspections were: RC-1-052-016-C41K, RC-1-052-020-C41K, and MS-1-416-001-S33R. The frequency of this type of procedure violation in the TRT's limited inspection suggests that this problem is generic for Unit 1.

6. Spherical Bearing Contamination:

(a) Applicable criterion

QI-QAP-11.1-28 Revision 22, Paragraph 6.3.1 Note 2 states in part that "bearing internal and external surfaces shall be free of rust and foreign material, and bearing shall move freely within the housing."

(b) Examples of spherical bearing contamination

The TRT found paint contamination in the bearings of both snubber assemblies on component support SI-1-090-006-C41K that severely obstructed the bearing cavities and limited their movement. This Class 1 component support is located in the Containment Building of the Unit 1 safety injection system. A similar condition exists on support MS-1-416-002-S33R.

7. Snubber Adapter Plate Bolting - Lack of Full Thread Engagement:

(a) Applicable criteria

QI-QAP-11.1-28, Revision 22, Paragraph 6.1, states that "all bolts, studs, or threaded rods shall have full thread engagement in the nut."

ASME Sect. III, Div. 1, Subsection NF, Subarticle NF 4711 states that "the threads of all bolts or studs shall be engaged for the full length of thread in the nut."

QI-QAP-11.1-28, Revision 25, Attachment 29 permits less than full thread engagement in threaded plates. This allowance for less than full thread engagement is a potential violation of the ASME Code Sect. III, NF-4711; no code case was invoked to set aside this procedure. The requirement of NF-4711 that "the threads of all bolts or studs shall be engaged for the full length of thread in the nut" also implies that there be a full length of a threaded hole in plates, shapes, or bars where the required threaded hole length is the same as the bolt diameter. Further, there is no evidence that partial thread engagement at the snubber adapter plate connection has been given consideration in the design procedures for linear-type supports, nor does it appear that sufficient design margins have been introduced to allow for less than full-threaded connection. The TRT did not check "as-built" analyses to determine whether any such variations from the design norm had been considered in the "as-built" stress calculations.

What is in question is whether any calculations had been made to address this particular thread engagement condition for each size snubber being used in the plant.

(b) Examples of lack of full thread engagement

Snubber (shock arrester) adapter-plate bolt threads were insufficiently engaged in all four threaded holes of component support MS-1-416-002-S33R. The worst condition was 0.095" short, or more than 25% less than full thread engagement. Similar lack of full thread engagement deficiencies was found on NF supports SI-1-090-006-C41K and CT-1-013-012-S32K.

8. Threaded Rod Thread Engagement:

(a) Applicable criterion

QI-QAP-11.1-28, Revision 21, Paragraph 6.3.2.a. directs that "QC shall verify thread engagement if site [sight] holes are present in the strut body."

(b) Example of rod thread engagement deficiency

Sight holes were present in the strut body to verify threaded rod engagement. The rod was not visible through the sight hole for support RC-1-901-702-C82S.

9. Snubber/Sway Strut Load Pin Locking Device:

(a) Applicable criterion

QI-QAP-11.1-28, Revision 22, Paragraph 6.3.1.1.b states that "the size of the cotter pins, when used, should be the maximum size the hole will accommodate and shall be fully opened."

(b) Example of locking device deficiency

Sway strut No. AF-1-001-014-S33R had a broken cotter pin.

10. Load Side of Pipe Clamp Halves Not Parallel:

(a) Applicable criterion

QI-QAP-11.1-28, Rev. 25, Sec. 3.7.3.1 states that "pipe clamp halves, in relation to attaching eyerod end, shall be parallel."

(b) Examples of halves not parallel

Clamp halves for pipe supports AF-1-001-001-S33R and AF-1-001-014-S33R were not parallel.

11. Pipe Clearances Outside of Allowable Tolerance:

(a) Applicable criterion

QI-QAP-11.1-28, Revision 19, Attachment 4, item 3.b states "where the design shows 0" on one side and 1/16" on the other, 0" must be maintained while 1/16" ± 1/32" is required on the other side."

(b) Examples of pipe clearance violations

Pipe support CC-1-126-013-F33R exhibited no clearance on top or bottom, while the hanger drawing called out 0" on the bottom and 1/16" on top. A similar problem existed for pipe support AF-1-001-702-S33R.

12. Pipe Clamp Locknut Loose:

(a) Applicable criterion

QI-QAP-11.1-28 Revision 21, Sect. 6.1 states that "unless otherwise shown on the drawing, fasteners will be tightened securely."

(b) Example of loose locknut

A pipe clamp locknut for pipe support AF-1-035-011-S33R was found loose (less than finger-tight).

13. Snubber/Sway Strut Misalignment:

(a) Applicable criterion

QI-QAP-11.1-28, Revision 18, Sect. 6.3.1.d states that "maximum sway strut misalignment shall not exceed 5° for ITT-Grinell and NPSI from the centerline of the sway strut."

(b) Examples of misalignment

Pipe support CC-1-126-014-F43R exhibited angularity that exceeded this requirement. A similar problem existed with pipe support RC-1-052-020-C41R.

14. Snubber Cold Set (AC) Dimension Did Not Match Drawing:

(a) Applicable criterion

QI-QAP-11.1-28, Revision 24, Sec. 3.8.3.5.b states that "deviation of more than ± 1/8" from the specified cold setting (AC dimension shown on the design drawing) is not permitted, unless authorized by a design change."

(b) Example of incorrect AC dimension

Pipe support CS-1-085-003-A42K deviated by approximately 1" from the cold set dimension shown on the design drawing.

15. Support Configuration Did Not Match Drawing:

(a) Applicable criterion

QI-QAP-11.1-28, Revision 24, Attachment 2, Operation 3 lists the following inspection attribute: "support configuration complies with the design drawing."

(b) Examples of configuration problems

Pipe support snubber CT-1-005-004-S22K was installed end-to-end opposite from the orientation shown on the drawing. A similar problem existed with pipe support CT-1-013-010-S22K, where dimensional discrepancies existed on the support drawing that detailed the orientation of the snubber.

16. Component Type/Model No. Installed Did Not Match Drawing:

(a) Applicable criterion

QI-QAP-11.1-28, Revision 24, Sect. 3.2.1.1 states that "vendor-supplied NPT stamped component supports shall bear marking (i.e., name plate) traceable to the design drawing."

(b) Examples of component identification problems.

Model numbers of installed snubbers for pipe support SI-1-090-006-C41K did not match the model number on the design drawing. A similar problem existed with pipe support RC-1-052-020-C41R.

17. Weld Data Card Missing QC Initials For Welds:

(a) Applicable criterion

QI-QAP-11.1-28, Rev. 25, Paragraph 3.5.3 Welder and Welding Material Verification states that "The QCI shall verify that the welder is qualified to make the weld utilizing the welder qualification matrix (attachment 16, typical), that the use of the WPS (Attachment 17, typical), and the type of filler material listed on the WFML [weld filler material log] are the same as those listed on the weld data card (WDC), and the welder's symbol has been recorded on the WFML."

(b) Example of deficient weld data card

Support number CC-1-126-013-F33R had some welds performed with no QC inspector initials or signature on the corresponding blocks of the weld data card for that support inspection package.

18. Identification of Materials and Parts:

(a) Applicable criteria

10 CFR 50 Appendix B, Criterion VIII states that "measures shall assure that identification of the item is maintained by heat number, part number, serial number or other appropriate means either on item or on records traceable to the item, as required throughout fabrication, erection, installation and use of the item."

QI-QAP-11.1-28, Revision 19, Sect. 3.1.2 states that "at installation inspection, the QC inspector shall verify the hanger number, the material type, grade and heat number ... using the information provided on the Material Identification Log."

(b) Examples of material identification deficiencies

A replacement part (sway strut eyerod) for pipe support CT-1-013-014-S32R had no apparent material identification either on the hardware or in the documentation package for the support. The Material Identification Log (MIL) did not list any identification traceable to the origin of the replacement part. A similar problem existed with pipe supports CC-1-126-012-F33R, CC-X-039-005-F43R, and AF-1-035-011-S33R.

B. Deficiencies with High Rate of Occurrence

The following pipe support inspections by the TRT were in addition to those already listed in the previous examples. Results of these ancillary inspections are summarized in Table 3.

The TRT identified six specific deficient items which need further evaluation to assess their generic implications. The TRT concern is that these items may have a high rate of occurrence throughout plant safety-related systems. The specific "frequently occurring" items and relevant inspection criteria were as follows:

(1) Strut and snubber load pin spherical bearing clearance with washers was excessive (Ref. QI-QAP-11.1-28, Sec. 3.7.3.1 Rev. 25).

(2) Strut and snubber load pin locking devices (cotter pins or snap lock rings) were damaged or missing (Ref. QI-QAP-11.1-28 Rev. 25, which did not specifically address load pin locking devices).

(3) Pipe clamp halves on load side were not parallel (Ref. QI-QAP-11.1-28, Sec. 3.7.3.1 Rev. 25).

(4) Bolts threaded into tapped holes of snubber adapter plates had less than full thread engagement (a "frequently occurring" deficiency; see related discussions on pipe supports, example 7 "Snubber Adapter Plate Bolting - Lack of Full Thread Engagement" within Part A of this section on as-built inspection).

(5) "Hilti Kwik" bolts (concrete expansion anchors) as installed did not meet minimum effective embedment criteria (Ref QI-QP-11.2-1, Sec. 3.5.1 Rev. 16).

(6) Locking devices for threaded fasteners were missing or of a non-approved type (see item 2 "Locking devices for threaded fasteners" on pipe support deficiencies within Part A of this section on as-built inspection).

Table 3 Summary of additional TRT inspections

Area: Room 77N, El 810'-6"
Unit 1, Safeguards Bldg

	Deficiency	No. of Supports Inspected	No. of Supports Deficient	% Deficient
Item 1.	Excessive Spherical Bearing Clearance	92	5	5.4%
Item 2.	Load Pin Locking Device Missing	92	14	15.2%
Item 3.	Pipe Clamp Halves Not Parallel	40	9	22.5%
Item 4.	Snubber Adapter Plate Bolts With Less Than Full Thread Engagement	19	*13	to be determined

Area: Cable Spread Room 133, El 807'-0"
Unit 1, Auxiliary Bldg

	Deficiency	Bolts Inspected	Number Deficient	% Deficient
Item 5.	Hilti Kwik Bolt Does Not Meet Minimum Embedment**	24	3	12.5%

*Bolts had less than full thread engagement.

**Taking into account the "allowed" slippage of the bolt for a distance of one nut thickness due to torquing (Ref. "Installation of 'Hilti' Drilled-In Bolts" 35-1195-CEI-20, Rev. 3, Para. 3.1.4.1) and the minimum specified embedment, the above Hilti bolts violated the "effective" embedment requirements.

The TRT undertook additional hardware inspections to ascertain the regularity with which these specific items may exist. All accessible pipe supports in Room 77N, at the 810-foot, 6-inch elevation of the Unit 1 Safeguards Building, were inspected for "frequently occurring" deficiencies 1, 2, 3 and 4 listed above. To assess the level of occurrence of "frequently occurring" deficiency 5, electrical support 'Hilti' baseplates located in the Cable Spread Room 133, at the 807-foot elevation of the Unit I Auxiliary Building, were inspected. For details on "frequently occurring" deficiency 6, see item A.2, "Locking Device for Threaded Fasteners," of the pipe support deficiencies, described above.

C. Electrical Raceway Support Inspections

The TRT inspected electrical conduit supports and cable tray hangers to the requirements of QI-QP-11.10-1, Inspection of Seismic Electrical Support and Restraint Systems; QI-QP-11.21-1, Requirements of Visual Weld Inspection; and other applicable instructions for conduit support and cable tray hanger inspections. All electrical raceway supports included in TRT inspections had been previously QC accepted. Table 4 summarizes the results of the TRT inspections not previously provided as part of our letter of September 18, 1984.

The TRT found the following discrepancies during its inspection of selected electrical conduit supports and cable tray hangers in Unit 1:

1. Undersize Welds:

(a) Applicable criterion

DCA 3464, Rev. 23, page 3 of 32, note 3 states in part that "welding requirements as shown on various details should be read as the minimum requirement."

(b) Examples of undersize welds

Three of four welds on conduit support C120-21-194-3 (cable spread room) were undersized. The required weld size was 1/4" at all weld joints, while the measured weld size was 7/32" to 5/32" for the full lengths of three out of the four welds.

Similarly, cable tray hanger CTH 5824 (Containment Building) had 12 undersize welds. The all-around welds on the six horizontal beams should be 1/4" in size, according to details L_1 and L_2 on Drawing FSE-00159, sheet 5824, 1 of 2. The measured size of these welds was 3/16" to 5/32" at each connection. Also, support IN-SP-7b exhibited undersize welds measuring 7/32" to 5/32" instead of the required 1/4".

Table 4 Summary of electrical raceway support inspection by the TRT - unit 1

Support welds inspected	59
Supports inspected	5*
Supports with problems	3 (60%)
Types of problems	
Hardware-related, other than welding	6
Unauthorized configuration change	1
Weld-related types of problems (categories)	2
Welds requiring rework	41
Welds made in field but not recorded on drawing	80**
Beam stiffeners added but not recorded on drawing	40
Building/Area	**Supports**
Cable Spread Room	CTH 12646 C 130-21-250-3 C 120-21-194-3
Auxiliary Building	CTH 6742
Containment	CTH 5824

*All electrical supports inspected by the TRT had been previously inspected and accepted by QC.

**Full visual inspection was not performed by the TRT on these extra welds.

2. Misplaced Welds:

(a) Applicable criterion

QI-QP-11.10-1, Revision 29, Paragraph 3.5.2, Assembly Inspection, includes the requirement to inspect a support for configuration. Paragraph 3.6.2 of the same procedure requires that support welds receive visual inspection and that nonconforming welds be reported.

(b) Examples of misplaced welds

During inspection of Hanger CTH-6742, the TRT found that two structural welds were made in the wrong direction. The 3/16" shop welds which join MK-10 and MK-11 were made horizontally instead of vertically, as shown on drawing FSE-00159, sheet 6742. QC Inspection Report ME-I-0024909, dated February 16, 1984, accepted all inspectable attributes as satisfactory prior to the TRT inspection.

3. Unauthorized Configuration Changes:

(a) Applicable criterion

QI-QP-11.10-1, Inspection of Seismic Electrical Support and Restraint Systems, paragraph 3.5.2 includes the requirement for inspection of a support for configuration compliance.

(b) Examples of configuration change

The TRT found that cable tray hanger CTH 5824 (Containment Building) had been fabricated to include 40 more stiffeners and 80 more welds than required or shown on drawing FSE-00159, sheet 5824, 2 of 2, Detail L_2. Inspection Report ME-1-0006155 verified final QC inspection and acceptance on January 3, 1984.

Further, cable tray hanger CTH-6742 (Auxiliary Building), Clip, MK-12, should be 6" x 6" x 3/4" angle stock in accordance with FSE-00159, sheet 6742. The actual flange thickness of MK-12 was 3/8".

4. Hilti Anchor Bolt Installation Deficiencies:

(a) Applicable criterion

QI-QP-11.2-1, Concrete Anchor Bolt Installation, provided requirements for proper installation and inspection of Hilti anchor bolts.

(b) Examples of Hilti bolt deficiencies

CTH-6742 (Auxiliary Building) anchor bolt torque was not verified (paragraph 3.5 of the procedure). Hilti bolts were not marked in accordance with attachment 1 of the procedure, nor was the length of these bolts verifiable (paragraph 3.2).

CTH-5824 (Containment Building) base plate bolt holes had violated minimum edge distance--edge distance cannot be less than 1 7/8" (Attachment 2 of the procedure). Actual distance was 1 5/8" to 1 3/8" from the nearest plate edge. This condition affected five of the eight Hilti anchor bolt holes in the base plates for this hanger.

One Hilti bolt was skewed to more than 15 degrees. Maximum allowable skew was 6 degrees without corrective bevel washers (paragraph 3.1.2).

The Hilti bolt torque on this hanger CTH 6741 (Auxiliary Building) was not documented as being verified by QC (paragraph 3.5).

5. Undersize Nuts:

There was inconsistency in the application of nuts for SA-325 bolts in that both standard and heavy hex nuts were used. No stipulation was found which would permit the use of standard (non-heavy) hex nuts. This condition is a potential violation of the Material Specification ASTM A325 (ASTM, Part 4-1974) paragraph 1.5, which provides that "heavy hex structural bolts and heavy hex nuts shall be furnished unless other dimensional requirements are stipulated...." B&R Drawing No. FSE-000159, sheet 5824, 2 of 2, required the use of ASTM A325 bolts for cable tray hanger number CTH-5824.

D. Summary of Pipe Support and Electrical Raceway Support Inspections

The as-built verification effort conducted by the TRT provides evidence of faulty construction by craft personnel, installed hardware that does not match as-built drawings, and ineffective QA and QC inspections. Despite the small size of the TRT's sample, there appears to be a large number of deficiencies. The potential also exists that these deficiencies are not represented correctly in the final stress analysis.

5 DOCUMENT CONTROL

The TRT evaluated the CPSES document control system to determine if it was effective and if it ensured consistent quality of documents for construction practices and records. The results of this review showed the following problems.

A. The TRT found that there was a potential for document control center (DCC) field distribution centers (satellites) to issue deficient document packages to craft personnel. Typical problems identified were: packages were not thoroughly examined; procedures and guidelines were not specific or were not followed; and documents controlling operation of the centers existed in the form of guidelines and charts rather than as controlled procedures.

B. The TRT found that many problems indicative of inadequate drawing control existed at CPSES from September 1981 to April 1984. These problems had been identified prior to the TRT's evaluation by both TUEC and NRC Region IV audits and reviews.

Prior to placing the satellites in operation (a phased effort between February and August 1983), DCC distributed drawings, component modification cards (CMCs), and design change authorizations (DCAs) to file custodians, welding engineering, the pipe fabrication shop, QC, and the hanger task force. Document control through this system proved to be ineffective.

In an attempt to correct identified problems, DCC satellites were created to distribute drawings to field personnel, rather than use the file custodians. However, between August 1983 and April 1984, recurring problems with document control were identified. Examples of the types of document control problems that existed between August 1983 and April 1984 were as follows:

1. Drawings released to the field were not current.
2. Drawing and specification changes were not current.
3. Design documentation packages were incomplete.
4. DCC did not provide the satellites with up-to-date drawings, CMCs, DCAs and document revisions.
5. Drawings hanging from an open rack, which had no checkout control, were available to craft and QC personnel.
6. Design change logs were inaccurate.
7. Design documents were not always properly accounted for in DCC.
8. Current and superseded copies of design documents were filed together.
9. Satellite distribution lists were inaccurate.
10. There were discrepancies between drawings contained in the satellites and those in DCC.

11. Some drawings were missing from the satellite files.

12. Telephone requests for design documents resulted in the issuance of documents that bypassed the controlled distribution system.

In April 1984, top management took a direct interest in recurring document control problems. Their efforts appear to have been successful. For instance, in April 1984 satellites 306 and 307 had error rates of 30% and 10%, respectively; but by July 1984, these error rates had fallen to less than 1% for both satellites. The TRT has found that TUEC document control after July 1984 was adequate; however, the effects of document control inadequacies prior to July 1984 have yet to be fully analyzed by TUEC.

C. Deficiency reporting procedure CP-EP-16.3 appeared to relate only to craft and engineering personnel and was not directed to noncraft and nonengineering personnel who may have had knowledge of reportable items. Procedure CP-EP-16.3 indicated that the applicable manager was responsible for documenting and reporting Deficiency and Disposition Reports (DDRs); but there were no checks or balances to ensure that a manager or a designated substitute would process a DDR.

D. TUEC did not consider the CYGNA audit findings regarding the DCC as appropriate for formal reporting to the NRC pursuant to 10 CFR 50.55(e), as required by procedure CP-EP-16.3, "Control of Reportable Deficiencies."

E. The TRT found that the DCC issued a controlled copy stamp to the QC department to expedite the flow of hanger packages to the Authorized Nuclear Inspector. Methods for this kind of issuance and control of such stamps were not described in TUEC's procedures.

6 TRAINING/QUALIFICATION

The TRT identified numerous weaknesses during its review of the ASME and non-ASME training, certification, and qualification of QC and DCC personnel. TUEC's training and certification program lacked the programmatic controls to ensure that the requirements in 10 CFR 50, Appendix B were achieved and maintained. The items identified by the TRT include those listed below, in addition to the items previously provided in our letter of September 18, 1984.

A. Twenty percent of the training records reviewed contained no verification of education or work experience.

B. The results of Level I certification tests were used for some Level II certifications rather than the results of a Level II test.

C. After failing a certification test, a candidate could take the identical test again.

D. Certifications were not always signed or dated.

E. White-out was used on certification tests.

F. Seven inspectors had questionable qualifications.

G. There was no limit or control on the number of times an examination could be retaken.

H. No guidelines were provided for the use of waivers for on-the-job training.

I. In some cases recertification was accomplished by a simple "yes" from a supervisor.

J. There was no formal orientation training for DCC personnel prior to August 1983.

K. The responsibility for administration of the non-ASME training program was not clearly assigned to a single individual or group.

L. Non-ASME personnel capabilities were loosely defined by levels (I, II, III).

M. There were numerous additional problems in non-ASME certification testing, such as: no requirement for additional training between a failed test and the retest; no time limitation between a failed test and a retest; two different scoring methods to grade a test and a retest; no guidelines on how a test question should be disqualified; no program for periodically establishing new tests except when procedures changed; and no details on how the administration of tests should be monitored.

N. The exemption provision in ANSI N45.2.6, which allowed substitution of previous experience or demonstrated capability, was the normal method for qualifying inspection personnel rather than the exceptional method.

7 VALVE INSTALLATION

The TRT found that installation of certain butt-welded valves in three systems required removal of the valve bonnets and internals prior to welding to protect temperature-sensitive parts. The three systems involved were the spent fuel cooling and cleaning system, the boron recycle system, and the chemical and volume control system. This installation process was poorly controlled in that disassembled parts were piled in uncontrolled areas, resulting in lost, damaged, or interchanged parts. This practice created the potential for interchanging valve bonnets and internal parts having different pressure and temperature ratings.

8 ONSITE FABRICATION

The TRT findings regarding onsite fabrication shop activities indicated that:

A. The scrap and salvage pile in the fabrication (fab) shop laydown yard was not identified and did not have restricted access.

B. Material requisitions prepared in the fab shop did not comply with the applicable procedure.

C. The fab shop foremen were not familiar with procedures that controlled the work under their responsibility.

D. Fabrication and installation procedures did not include information to ensure that B&R-fabricated threads conformed to design specifications or to an applicable standard.

E. Indeterminate bulk materials that accumulated as a result of site cleanup operations were mingled with controlled safety and nonsafety material in the fab shop laydown yard.

F. Site surveillance of material storage was not documented.

G. Work in the fab shop was performed in response to memos and sketches instead of hanger packages, travelers, and controlled drawings.

9 HOUSEKEEPING AND SYSTEM CLEANLINESS

TRT inspections at CPSES indicated that the facility was well maintained. However, two issues were identified that indicate housekeeping and system cleanliness deficiencies.

A. The TRT reviewed the August 6, 1984, draft of flush procedure FP-55-08. The purpose of this procedure was to verify the cleanliness of Unit 1 reactor coolant loops, including the reactor vessel, by means of hand-wiping, visual inspection, and swipe testing. Tests to determine surface chloride and fluoride contamination were performed by TUEC systems test engineers and Westinghouse representatives. The TRT notes, however, that FP-55-08 required only two swipe tests of the reactor vessel—one on the side and one on the bottom. This limited number of swipe tests may not provide adequate assurance that the vessel had been properly cleaned.

B. In rooms 67, 72, and 74 of the Unit 2 Safeguards Building, the TRT observed that not all snubbers were wrapped with protective covering when welding was being done in close proximity to them. This practice was a violation of B&R procedure CP-CPM-14.1, which required protection of installed equipment during welding. This condition was immediately corrected when the TRT reported it to TUEC QA management, and an inspection was performed by TUEC to correct similar conditions in other areas as well.

10 NONCONFORMANCE REPORTS (NCRs)

There were several weaknesses in the NCR and deficiency identification reporting systems. The TRT found that:

A. The TUEC procedure for preparation and processing of NCRs did not contain explicit instructions for handling voided NCRs.

B. NCRs were used as a tracking document to record removal of a part from equipment on a permanent equipment transfer rather than for reporting a nonconforming condition; such usage of the NCR was not defined in procedures.

C. There was an inconsistency between paragraphs 2.1 and 3.2.1 in procedure CP-QP-16.0. Paragraph 2.1 required all site employees to report nonconformances to their supervisor or to the site QA supervisor, while paragraph 3.2.1 required persons other than QA or QC personnel to submit a draft NCR to the Paper Flow Group.

D. The NCR form had no form number or revision date to indicate that the form was being adequately controlled.

E. There were two versions of the TUEC NCR form, one with and one without a space for the Authorized Nuclear Inspection (ANI) review.

F. The NCR form had no space to identify the cause of the nonconformance and the steps taken to prevent its recurrence.

G. The NCR form had no provision for quality assurance review.

H. The TRT found approximately 40 different forms (other than NCRs) for recording deficiencies. Many of these forms and reports were not considered in trending nonconforming conditions.

11 MATERIALS

The as-built review effort by the TRT included a material traceability check on 33 of the same pipe supports that the TRT had field inspected. The material traceability was adequate for those 33 pipe supports, with the exception of four material identification discrepancies, as noted in section 4 on as-built inspections.

In another case, TUEC failed to maintain material traceability for safety-related material and numerous hardware components. This QA breakdown was identified in an ASME Code survey in October 1981 yet was not reported to the NRC in accordance with the requirements of 10 CFR 50.55(e).