ORIGINAL

UNITED STATES
NUCLEAR REGULATORY COMMISSION

IN THE MATTER OF:

DOCKET NO: STN 50-498-OL
STN 50-499-OL

HOUSTON LIGHTING AND POWER COMPANY,
et al.

(SOUTH TEXAS PROJECT, Units 1 and 2)

EVIDENTIARY HEARING

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:	:	DOCKET NO.
HOUSTON LIGHTING AND POWER	:	STN-50-498-OL
COMPANY, ET AL.,	:	STN-50-499-OL
(South Texas Project Units 1 & 2	:	

University of Houston
Teaching Unit II, #215
Houston, Texas

Wednesday, 31 July 1985

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

JUDGE CHARLES BECHHOEFER, Chairman,
Atomic Safety and Licensing Board.
JUDGE JAMES C. LAMB, Member,
Atomic Safety and Licensing Board.

JUDGE FREDERICK J. SHON, Member,
Atomic Safety and Licensing Board.

APPEARANCES:

On behalf of the Applicants:

MAURICE AXELRAD, Esq.,
ALVIN GUTTERMAN, Esq.,
DONALD J. SILVERMAN, Esq.,
STEVEN P. FRANTZ, Esq.,
Newman & Holtzinger,
Washington, D.C.

On behalf of the Nuclear Regulatory Commission Staff:

ORESTE RUSS PIRFO, Esq.,
Office of the Executive Legal Director

On behalf of the Intervenor:

LANNY ALAN SINKIN,
3022 Porter St. N.W., #304
Washington, D.C. 20008
Representative for Citizens Concerned About
Nuclear Power.

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PROCEEDINGS

JUDGE BECHHOEFER: Good morning, ladies and gentlemen. Before we resume with the Bechtel panel, are there preliminary matters?

MR. AXELRAD: We have one preliminary matter, Mr. Chairman. On Monday, a question was raised with respect to audits of soils conditions at the STP in 1985. What we've decided to do is, in order to eliminate any question of any kind, is that we're in the process of compiling all of the audits with respect to soils that have been performed at the South Texas Project by either HL&P or Ebasco or Bechtel since the 1984 audit report which was the initial document involved in this contention, so we're compiling those audit reports and the responses to those audit reports and we will make copies available of those to the parties and to the Board after lunch today.

JUDGE BECHHOEFER: That sounds fine. Are we going to have adjourn to read them all.

MR. AXELRAD: Well, the soils panel is not going to be on until tomorrow.

MR. SINKIN: Oh, I see go home tonight to read them.

JUDGE BECHHOEFER: I mean are they very extensive, or are they --

MR. AXELRAD: I don't honestly remember, but I would suspect it's about a half inch of material. We are not -- none of those materials will be exhibits in this proceeding for us but we're making it available to the parties. If the parties see anything in there that they wish to tender as exhibits or question on then our witnesses will be able to answer those.

The one thing that we will be providing, which will an exhibit is the revised version of the response to the notice of violation. That will be substituted as the exhibit that we previously indicated, the original version of the response of notice of violation, that would be a substitute exhibit.

MR. PIRFO: With regard to soils, I represented to the Board a couple of days ago that Mr. Tapia would be here as of this morning. It doesn't matter for purposes of the hearing, but he actually will not arrive until late this afternoon. But since I had represented to the Board he would be here this morning, I wanted you to know he won't be here until late this afternoon.

MR. SINKIN: Mr. Chairman, I guess we'll reserve comment about these new documents until we have a chance to look at them. I hope we'll have time to prepare on these documents before the witnesses appear.

There is another matter that I wanted to bring

up this morning and to put on the record. I received a call two days ago from a reporter in Austin that there was going to be a meeting in Arlington, Texas between HL&P and the NRC to discuss how the NRC would be going through the documents released from under the gag order.

And I made arrangements with with one someone in Dallas to contact the NRC office and request to appear as our representative at that meeting. And she was told that the meeting was closed; we would not be allowed to attend.

I then contacted -- last night I found that out and I spent a good bit of the evening trying to do something about this.

We contacted Region IV and asked that the meeting be transcribed in case their decision that the meeting should be closed turned out to be in error, that if we could show that, later we would get the transcript.

We were told last night late that they were not going transcribe the meeting either. We are pursuing this this morning still; and I would just like it on the record that we object to the NRC staff scheduling significant meetings when we are in licensing hearings, when CCANP's primary representative, myself, cannot be present at those meetings, even were they open.

We object to the NRC staff and HL&P holding

secret meetings. We think they should be open and we certainly object to them refusing to even produce a transcript to protect the possibility that they've closed the meeting improperly. And we just wanted to put that on the record this morning.

JUDGE BECHHOEFER: Mr. Pirfo, I have in my files right in front of me a notice of a meeting dated July 23. Is this the meeting that Mr. Sinkin is referring to? Do you know the notice I'm talking about. It was circulated to the parties.

MR. PIFRO: If I can approach and just take a quick look, I think I've seen that, unless you have notes on it or something.

JUDGE BECHHOEFER: No, I don't.

MR. PIRFO: Let me just take a look at it to save time.

JUDGE BECHHOEFER: This just came in the distribution list and it says the service list is on there.

MR. PIRFO: This is the meeting. And this is -- I wanted to respond to Mr. Sinkin a little bit more fully.

JUDGE BECHHOEFER: Show it to Mr. Sinkin.

MR. SINKIN: I'm sure it was sent to my home in Washington and I'm in Houston.

MR. SINKIN: We all have one address and you sent a motion to our oiffice on Friday which I never received.

MR. SINKIN: I am not objecting to the notice, I found out about the meeting -- a reporter called me because he got a notice too.

JUDGE BECHHOEFER: Did Mr. Goldstein get a notice or --

MR. SINKIN: I didn't call the Mr. Goldstein even. The reporter called me and I said, "I'll get somebody to go."

JUDGE BECHHOEFER: He could see it if he wants to.

MR. PIRFO: He doesn't care to.

The first point I'd like to respond to is the scheduling of the meeting. The fact that we're in hearing is certainly a disadvantage for Mr. Sinkin personally. But the NRC cannot be expected to conduct its business around the schedule of one individual. So it's unfortunate that it happened in this week. But we -- from the looks of the hearing time that we've spent so far, we're going to be in hearing for a good deal of the fall. And to order the NRC's business around Mr. Sinkin's personal schedule is a little bit wishful thinking on Mr. Sinkin's part to think that can be done.

Secondly with regard do the meeting being secret, I have hearsay upon hearsay upon hearsay presented by Mr. Sinkin that the meeting was secret, and as Judge Bechhoefer just showed the parties, there was a notice about the meeting. I don't understand where the secrecy involved in this meeting came in.

Now Mr. Sinkin had someone call from Dallas; I don't know -- we don't know who that was; they called someone else who we don't know who that person was. Maybe one of these two people were misinformed or some breakdown of communication reached Mr. Sinkin.

That's unfortunate but it's not the plight -- it's not the problem of the NRC to make sure the communication lines to Mr. Sinkin are clear. I don't understand where he got the idea that these meetings were secret, and we rest on that.

MR. SINKIN: Let me just clarify something.

JUDGE BECHHOEFER: Receipt me ask one question. It's my experience that these meetings are also not closed to intervenors.

MR. SINKIN: Normaly we are allowed.

JUDGE BECHHOEFER: At least in other cases that I have been in.

MR. PIRFO: They are not closed.

JUDBE BECHHOEFER: That have not be closed.

MR. PIRFO: That's my impression and I assume that's the case that obtains in this particular instance as well.

JUDGE BECHHOEFER: To the extent proprietary data is discussed, they are closed. But those are usually segments of meetings where those types of materials are discussed.

MR. SINKIN: I was probably not as clear as I should have been. Let me start at the beginning. I got a call about the meeting; I called someone in Dallas and asked them to contacted the regional office and say they were coming as our representative.

They called me back and said they said I can't come. I called the duty officer in Arlington got a recording; called the duty officer in Washington last night; talked to the duty officer in Washington told him my problem, asked him to have Mr. Martin call me. The duty officer in Arlington called me. I told him the problem. Made the suggestion about we aren't asking that we have to come, we're just ask that you take a transcript so if it turns out you shouldn't have closed the meeting we will have the transcript available to us.

He said, "I'll check on it."

At 11:30 last night, the duty officer called me back and said he had talked with some people, didn't say

who, and that the meeting was closed and there would be no transcript. And we checked again this morning with the regional office and we haven't received a return phone call by the time I left to come to these hearings.

MR. PIRFO: My impression is simply that Mr. Sinkin was misinformed and didn't follow up with the correct people. As far as having a transcript, I mean, we can't be expected to order a transcript for the convenience of Mr. Sinkin. So I see that as a total --

MR. SINKIN: Not for my convenience, for the party that's not allowed to be present.

MR. PIRFO: Well, the party that's not there or for whomever.

JUDBE BECHHOEFER: It's contrary to my own experience that parties are kept out. Now, I don't know -- except for proprietary data.

MR. SINKIN: I understand that.

JUDGE BECHHOEFER: Or classified, if that's the case, are discussed.

MR. PIRFO: Mr. Sinkin has stated his position for the record here for whatever purposes that serves and the staff has responded and I don't think it's appropriate to continue this discussion at this point. But I'm more than happy to if the Board deams it proper.

JUDGE BECHHOEFER: Do you have anyone who is in

Arlington who wishes to -- could attend? It starts at 9:30.

MR. SINKIN: We have been making calls to the Arlington office, the person in Dallas, the in Dallas was making calls and ready to attend and has not gotten return phone calls. The last message I got at 8:30 this morning they were not returning her phone call.

JUDGE BECHHOEFER: I was just wondering if they walked into the room whether they had they would be kept out.

MR. SINKIN: I did not want to have her do that.

MR. PIRFP: I have no idea. I don't see it as a --

JUDGE BECHHOEFER: This notice does not state anything to the effect that it's a closed meeting. And usually the notices when they're sent out to the parties and probably made available to the press as well, but I'm not sure how this is handled.

MR. SINKIN: That's the normal experience we have, Mr. Chairman. I mean even if the notice is a little late, I get a call and they say, "We mailed the notice but you're not going to get in it time, we're going to have this meeting in Bethesda and if you would like to come, let me know."

MR. PIRFO: This notice is dated July 23rd.

MR. SINKIN: The notice is not at issue. It went out obviously.

MR. PIRFO: If the notice is not at issue, I don't understand what is in --

MR. SINKIN: We are in Houston.

MR. PIRFO: Unfortunately, we are yet to develop a system where a person can be in two places at one time.

MR. SINKIN: I have somebody in Dallas who's waiting to go to the meeting who's be told they cannot go.

MR. PIRFO: I cannot address that. I don't dispute the fact that she's been told she cannot go. All I'm saying is perhaps she was misinformed.

MR. SINKIN: By the counsel for the region she was informed.

MR. PIRFO: She was informed by Mr. Brown --

MR. SINKIN: Brown.

MR. PIRFO: -- that she could not to go that meeting?

MR. SINKIN: That she could not go.

MR. PIRFO: I'll reserve any statement on that until I've spoken with Mr. Brown and gotten the full story firsthand.

JUDGE BECHHOEFER: The notice says that Mr. Constable should be contacted if you want to go.

MR. SINKIN: We tried the first and didn't reach him. And so we called the region directly, we tried to call the regional administrator and the call back was from Mr. Brown saying the meeting was closed.

MR. PIRFO: Can I have a name of the person that called so I can talk to Mr. Brown and jog his memory.

MR. SINKIN: Juanita Ellis.

MR. PIRFO: I can remember that.

MR. SINKIN: I thought you probably would.

MR. PIRFO: If I may make one other observation and this doesn't go to Mr. Sinkin's credibility, but take it for what it is worth. First he tells us it's the duty officer and then tells me the in the last 30 seconds is the regional administor or --

MR. SINKIN: No, No, the regional counsel talked to Ms. Ellis.

MR. PIRFO: When did that take place?

MR. SINKIN: I called Ms. Ellis and said, Ther's a meeting, can you go?"

She says, "Fine."

She calls the the region, she calls for Mr. Martin; she gets a call back from Mr. Brown who says the

meeting's closed; she calls me, tells me the meeting's closed; I try and call Mr. Martin last night at 7:30, the regional office is closed; I get a recording; I call up the duty officer in Washington, ask him to have Mr. Martin call me; he calls the duty officer in Arlington; the duty Arlington in calls me says I'll talk to people an get back to me; he gets back to me late liast night and says no attendance, no transcript.

MR. AXELRAD: Mr. Chairman, in any event, it seems to me that whatever point Mr. Sinkin wants to make he has made on the record. I don't believe it has any relevance to what this Board is here today to do. If Mr. Sinkin subsequently has a problem with respect to what transpired at the meeting, and believes he has something he should bring to the Board's attention, he will have plenty of opportunity to do so. We have witnesses waiting to testify, and I would suggest that we proceed with the hearing.

MR. PIRFO: The staff has nothing further to add, just simply wanted to respond to Mr. Sinkin's position.

JUDGE BECHHOEFER: Mr. Pirfo, why don't you have Mr. Taylor call one of the people who were supposed to be attending that meeting or might know something about the meeting just to find out if it is closed,

because if it is not, then Mr. Sinkin can call his representative. She would not be able to to go the whole meeting probably but she'd presumably could sit in most of it.

MR. PIRFO: That was my initial reaction, I could have Mr. Taylor do that. But in retrospect, I'd rather make that call myself and talk to Mr. Brown and/or Mr. Reis.

JUDGE BECHHOEFER: We were thinking so we wouldn't delay. Could you do it in five minutes?

MR. PIRFO: I don't see why not. The meeting starts at 9:30 so I have to do it in five minutes. I understand my charge here is to simply find out whether the mission --

MR. SINKIN: Whether the mission should be scrubbed?

MR. PIRFO: -- whether the meeting is closed, not to direct the holders of the meeting to open it.

JUDGE BECHHOEFER: No, no.

MR. PIRFO: Just simply ascertain the facts.

MR. SINKIN: If you could ascertain two things: If the meeting is closed; if it is closed, are they going to transcribe it.

MR. PIRFO: I'm sure they're not going to transcribe it, there's no need to ask that question.

JUDBE BECHHOEFER: There are bundreds of these meetings and they're never transcribed.

MR. SINKIN: I beg to differ. On Comanche Peak, they're all being transcribed.

MR. AXELRAD: Mr. Chairman, this is a meeting. All I can was look at that notice, I'm not -- there hasn't even been being established that that meeting relates to the matters before this Board or anything. I can appreciate the concern, he's raised it before the Board I think it's unfortunate we're going to take time for even telephone call to the made. But if it is the Board's wishes, let's take the --

MR. PIRFO: Whatever the Board orders me to do within reason; you order me to go make that phone call.

JUDGE BECHHOEFER: As I say, either you or Mr. Taylor can do it.

MR. PIRFO: I'll make the call.

JUDGE BECHHOEFER: Recess briefly.

(Recess.)

JUDBE BECHHOEFER: Back on the record.

MR. PIRFO: I made the call that the Board requested and spoke with William Brown, regional counsel. I was told that Ms. Ellis informed last night that the meeting was closed. However, that policy changed this morning, Ms. Ellis was told over an hour ago that the

meeting would be open and she would send a representative. The meeting has yet to start and I don't know whether Ms. or Mrs. Ellis is there or representative is there yet. But at any rate the meeting has yet to start, the meeting is open.

MR. SINKIN: Thank you, very much.

JUDGE BECHHOEFER: Thank you.

MR. PIRFO: You are welcome.

JUDGE BECHHOEFER: Anything further before we proceed with the witnesses panel?

MR. SINKIN: No, Mr. Chairman.

JUDBE BECHHOEFER: Would you like to take care of those minor corrections.

MR. FRANTZ: Yes, Mr. Chairman.

Whereupon,

SIDNEY A. BERNSEN AND FRANK LOPEZ, JR.,

testified further upon their oath as follows:

DIRECT EXAMINATION CONTINUED

By Mr. Frantz:

Q I'd like Dr. Bernsen or Mr. Lopez to refer to two minor corrections to their testimony. First one on page 11, line 14, yesterday you inserted the words "to some of" between the words "except" and "those." Do you

wish to make any change to that insertion?

A (By Mr. Lopez) Yes, to be grammatically correct, it should say except some of those actually reported.

Q Thank you. I would also like to refer your attention to page 26, line 13.

A (By Mr. Lopez) Yes.

Q Would you like to make any changes in that line?

A Yes, in reviewing it, it appears that there is one too many -- the word "as." The first "as" in the sentence should be deleted so that it would read "but not be performed as efficiently or consistently."

JUDGE SHON: While we're on this kind of little thing, on page 24, line 3, the thing says the "two sentences quoted by Quadrex," I think should be "quoted from Quadrex" or "from the Quadrex report."

MR. BERNSEN: Quoted from the Quadrex report.

MR. FRANTZ: I think that may be "quoted by CCANP."

JUDGE SHON: Or "quoted by CCANP," either one.

MR. AXELRAD: I believe if we insert the word "CCANP" for the word Quadrex, that would be correct. Is that correct, Mr. Lopez?

MR. LOPEZ: Yes.

JUDGE BECHHOEFER: Mr. Sinkin, you have, you said, voir dire?

MR. SINKIN: Yes, I have some preliminary question, Mr. Chairman.

As I understand where we stand, is you've moved to admit the testimony.

MR. FRANTZ: That's correct.

MR. SINKIN: And I have objected.

VOIR DIRE EXAMINATION

By Mr. Sinkin:

Q I'll ask this of you, Mr. Bernsen, is the purpose of this testimony to provide your evaluation of whether the findings you identify in your testimony were potentially reportable or May 8th, 1981?

A (By Dr. Bernsen) The purpose of the testimony is to provide my or our position or judgment on whether the statements in the Quadrex report were reportable. And particularly as stated in the testimony, addressing the question of whether these are representative of a significant quality assurance program breakdown.

Q So then the answer to my question is no. Let me state my question again. Listen very closely, please. Is the purpose of your testimony to provide your evaluation of whether the findings you identify in your

testimony were potentially reportable on May 8th, 1981?

A As I understand the common usage of "potentially reportable," yes, our testimony does embrace that concept as well.

Q And does it embrace that concept as it would apply to May 8th, 1981?

A In the sense that I'm not aware of any change in the regulatory guide answer, the I&E guidance with regard to that subject or the project practices, yes, that's true.

Q And just to be clear, on page ten of your testimony, line 12 through 16, sentence beginning "finally."

A Yes.

Q Should that sentence read "finally in a few cases, we are aware of information which Quadrex may not have possessed when it performed its review which would indicate that Quadrex findings were not potentially reportable under 10 CFR 50.55(e)1(i) on May 8th, 1918"?

A I believe you could read that into the statement as well.

Q When you say as well, you are including something else in the statement?

A As well as the statement that's contained in the testimony. In other words, let me explain. We

relied on underlying information which was available to the project at the time the Quadrex review was performed that didn't appear in all cases in the Quadrex documentation.

Q What effort did you make in preparing your testimony to ensure that the only information reviewed by the task force, by the panel, excuse me, was information available at the project as of May and April, 1981, when Quadrex was performing its review? That's when the information was available, they went and wrote their review at the end of April and delivered it in May.

MR. FRANTZ: I'm not sure now what Sinkin's question is.

MR. SINKIN: The Chairman appeared to have a question.

JUDBE BECHHOEFER: I have a question why May wasn't included because May is what affects reportability.

MR. SINKIN: Okay, well include May.

A (By Dr. Bernsen) In preparing the testimony as we've indicated, we tried to rely primarily on the Quadrex report. In some cases, as we've indicated, we relied on underlying information. We have made a rather thorough review of the testimony and conclude that with very few exceptions, if any, the material that we relied

on pre dated the Quadrex investigation.

Q What effort did you make in preparing your testimony to determine what Mr. Goldberg Dr. Sumpter and Mr. Robertson knew on May the 8th, 1981?

A I did not make a specific effort to determine what Mr. Goldberg, Sumpter, Robertson knew on May '81 in preparing the testimony.

A (By Mr. Lopez) I may add a comment that we did have available to us copies of the review sheets that were prepared, I understand, by Brown & Root and were a part of the information that at least Dr. Sumpter and Mr. Robertson had available to them in their reviews on I believe the evening of May 7th, and I also understand was utilized in their meetings on May 8th, as information that they had available to them.

MR. FRANTZ: For the record Mr. Lopez, is that Applicants' Exhibit 62 you were referring to?

MR. LOPEZ: Yes, it is.

Q (By Mr. Sinkin) Did you have available to you any records that Mr. Goldberg, Dr. Sumpter, or Mr. Robertson kept of their deliberations?

A (By Mr. Lopez) I did notes.

A (By Dr. Bernsen) No.

A (By Mr. Lopez) I should make one other clarification. Clearly in the intervening years, there

have been numerous instances where information came available to us that we were aware of preexisted May '81. In some instances, you know, when we were trying to investigate and did not find what we felt was enough information in the Quadrex report to make a complete determination, went back and checked the availability of some of those documents.

I make specific reference to information that was either made available -- made available to us have via the transition process that occurred in early '82 two, and other documents which indicated that either HL&P or Brown & Root was aware of certainly the status of certain design activities, which may or may not have been identified in the Quadrex report. And often -- and in a few instances, we went back and investigated those. We did not get that information from these briefing sheets.

(No Hiatus.)

Q But you did not make an effort to determine whether the HL&P review team -- let me use that as a generic term. The HL&P review team will be the three people so I don't have to name them all the time.

A Right. Right. Right.

Q You did not make an effort to determine whether the review team had that same information on May the 8th, 1981?

A No, other than if we found something that, at least I did, took a new look at the review sheets to see whether or not there might be some reference to it. I didn't make any effort in terms of trying to, you know, expand on information I had as to what they had available to me other than that.

Q Other than the review sheets?

A Other than the review sheets themselves.

Q Did you at any time visit with Mr. Stanley about the Quadrex report?

A I have had -- since these hearings began, I have had --

Q I should say in preparation for your testimony.

A In preparation for the testimony, no, no.

Q Let me carry on for just a minute. In your testimony at page 32, line 23, the sentence beginning

"with." To accurately reflect what you're testifying to, should that sentence read "With the exception of the deficiencies which were reported to the NRC on May 8th, 1981, no design errors with potential adverse safety implications were identified by Quadrex?"

MR. FRANTZ: Mr. Chairman, I don't see why this is an appropriate question for voir dire.

MR. PIRFO: I have the same problem. I've been having it since we started. It seems like just typical cross-examination. I don't understand how we're in voir dire here.

MR. SINKIN: I'm trying to get at -- the way the testimony is worded, I think the testimony does not address contention 9. It seems that maybe it does. I'm trying to get that nailed down that it indeed does address contention 9. Contention 9 is very specific, 50.55(e)(ii), 24 hours. It is not about whether the finding was reportable, which their testimony says over and over and over again.

MR. FRANTZ: Mr. Chairman, the contention clearly states the Applicants' failure to notify the NRC of the Quadrex report and the many findings belonging to those who actually report it within 24 hours at the time HL&P became aware of the findings violates 10CFR 50.55(e). Well, we have to determine whether or not,

first of all, whether any of the findings were, in fact, reportable. If none of the findings were reportable, then there was no violation.

MR. SINKIN: Well, you're missing my distinction. When I see them testify that the purpose of our testimony is to say whether this item was reportable, that could well mean after three interim reports a final report's been issued and he decides it's not reportable. That's not the contention.

MR. FRANTZ: Mr. Sinkin, as we had discussed yesterday, it is clearly relevant whether or not a finding is reportable whether that evaluation takes 24 hours, thirty days or three months. If it is determined that the finding is not reportable, I think that information is clearly relevant to the character and competence of HL&P, one; and, two, whether or not there was any failure to report. And, in fact, if you look at the very language of 50.55(e)(ii), that language talks in terms of, quote, reportable deficiency, end quote.

Q (By Mr. Sinkin) Mr. Bernsen, you're familiar --

MR. PIRFO: If I may be heard -- if the Staff may be heard. The problem I have is I don't see where we're going with this voir dire. What is it geared toward? Is this a renewed motion to strike the

testimony? Is he challenging the qualifications of the witnesses or are we just in cross-examination? That's the problem I'm having.

The objections you would make as to relevancy are a little bit different when you're in voir dire as opposed to when you're in cross and I don't know where he's going with is voir dire. Unless I missed something.

MR. SINKIN: No, no. I mean, I didn't say why I was doing it. Why I was doing it was to determine whether to renew the motion to strike after looking at the stated purpose of the testimony and then looking at the various lines in the testimony where this issue was addressed.

MR. PIRFO: I at least know where we're going.

JUDGE BECHHOEFER: Mr. Sinkin, how do you construe the word reportable in 50.55(e)(ii)?.

MR. SINKIN: Mr. Chairman, I'm construing it in light of, which was going to be my next question, in light of the I&E guidance where the term potentially reportable was introduced as a different concept than reportable.

MR. FRANTZ: Mr. --

MR. SINKIN: What I was trying to get clear

with the witness is whether they have in their mind that within the 24 hours you make a determination of something that's potentially reportable, then you decide if it's, in fact, reportable or are they testifying to whether the finding in the Quadrex report was ultimately reportable?

JUDGE BECHHOEFER: Well, the way I construe this it could be either one. If they knew it was reportable within 24 hours, they don't have to call it potentially reportable.

MR. SINKIN: I understand that. But it's not certainly limited within 24 hours to only things you know for a fact are reportable. There's a group called potentially reportable.

JUDGE BECHHOEFER: But given this use of the language, isn't their testimony at least in the terms of which it's phrased, at least attempting to meet this? Because in order to make this appropriate for voir dire, you'd have to show that either the entire testimony or very large segments of it have no bearing on the contention and --

MR. SINKIN: Well, that's precisely what I was doing. That's why I said it was voir dire. If they gave the wrong answers in my view, I was going to move to strike. But I'm not -- I think they've given answers

that indicate they do have in their mind looking at May the 8th, 1981, 24 hours reporting potentially or notifying potentially reportable items, that that is in their mind.

JUDGE BECHHOEFER: But the point is shouldn't further questioning of this be reserved for regular cross-examination, which it's certainly an appropriate subject for cross-examination?

MR. SINKIN: That's fine.

JUDGE BECHHOEFER: So, I think that would be better.

MR. SINKIN: There is one other item about this testimony that we find objectionable, Mr. Chairman.

Beginning at page 92, question 106, and continuing to page 107, answer 141, Mr. Lopez and Mr. Bernsen are testifying about precisely the same findings Mr. Goldberg testified to. This testimony is both duplicative and cumulative. Mr. Goldberg has told his story. There is no need for a parade of witnesses to come forward to say they agree with Mr. Goldberg. I think about the witnesses that CCANP has been denied and none of them were to be called to testify precisely on the points another witness had already testified to.

So, we would move to strike the testimony from

question 106 on page 92 through answer 141 on page 107.

MR. FRANTZ: Mr. Chairman, I am at a loss to understand this objection. If Mr. Sinkin is conceding everything that Mr. Goldberg said regarding the reportability of these findings, I guess we can almost go home right now. I assume Mr. Sinkin does not concede that.

This testimony is introduced to present the expert opinion of our witnesses regarding whether or not these findings are reportable. It certainly is relevant and material. I think it's important that the Board have this type of expert opinion so that the Board has additional information on which to judge whether or not results reached by HL&P on May 8th were correct or improper.

JUDGE BECHHOEFER: The Board thinks this testimony should stay in, so we will overrule the objection.

MR. SINKIN: Other than those items, Mr. Chairman, we're more than happy to have this testimony come in.

MR. PIRFO: The Staff has no questions on voir dire, if that's the point we're at.

JUDGE BECHHOEFER: Yes, we are.

MR. PIRFO: Well, we just passed it then.

JUDGE BECHHOEFER: And you have no objection to the testimony --

MR. PIRFO: No, sir.

JUDGE BECHHOEFER: -- being admitted?

MR. PIRFO: No, sir.

JUDGE BECHHOEFER: The testimony will be admitted with the exception of the few lines that we struck.

MR. FRANTZ: Thank you, Mr. Chairman.

JUDGE BECHHOEFER: And it will be bound in the record at this point as if read.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
HOUSTON LIGHTING & POWER COMPANY, ET AL.	)	Docket Nos. STN 50-498 OL STN 50-499 OL
	)	
(South Texas Project, Units 1 and 2)	)	

TESTIMONY ON BEHALF OF HOUSTON LIGHTING & POWER COMPANY, ET AL., OF SIDNEY A. BERNSEN AND FRANK LOPEZ, JR.*

Q.1 Dr. Bernsen, please state your name.

A.1 My name is Sidney A. Bernsen.

Q.2 Mr. Lopez, please state your name.

A.2 My name is Frank Lopez, Jr.

Q.3 Dr. Bernsen, please identify your present employment.

A.3 I am employed by Bechtel Power Corporation as the Corporate Manager of Quality Assurance.

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*/ Dr. Bernsen is sponsoring the answers in A.1, A.3, A.5, A.8, A.10, and A.11. Mr. Lopez is sponsoring the answers in A.2, A.4, A.6, A.9, A.12, and A.13. Both Dr. Bernsen and Mr. Lopez are sponsoring all of the remaining answers.

Q.4 Mr. Lopez, please identify your present employment.

A.4 I am employed by Bechtel Energy Corporation (Bechtel) as an Assistant Project Engineer assigned to the South Texas Project (STP).

Q.5 Dr. Bernsen, please describe your professional qualifications.

A.5 My professional qualifications are described in the Statement of Professional Qualifications of Sidney A. Bernsen, which is attached hereto and incorporated by reference.

Q.6 Mr. Lopez, please describe your professional qualifications.

A.6 My professional qualifications are described in the Statement of Professional Qualifications of Frank Lopez, Jr., which is attached hereto and incorporated by reference.

Q.7 What is the purpose of your testimony?

A.7 The purpose of our testimony is to address Citizens Concerned About Nuclear Power (CCANP) Contention 9, as set forth at page 24 of the Licensing Board's Memorandum and Order of February 26, 1985, which states:

> The Applicants' failure to notify the NRC (Region IV) of the Quadrex Report, and of many findings beyond those actually reported, within 24 hours from the time HL&P became aware of the findings or prospective findings of the Report (including drafts), violates 10 C.F.R. § 50.55(e)(2) and reflects adversely on

the character and competence of the Applicants and on their ability to manage the construction and operation of a nuclear power plant.

More specifically, our testimony discusses whether the findings in the "Design Review of Brown and Root Engineering Work for the South Texas Project" (Quadrex Report) (May 1981), as identified by the Licensing Board in its Memorandum and Order of February 26, 1985, its Sixth Prehearing Conference Order of May 17, 1985, and its Memorandum and Order of May 24, 1985, represent a significant breakdown in any portion of the quality assurance (QA) program within the meaning of 10 CFR § 50.55(e)(1)(i).

Q.8 Dr. Bernsen, please describe any experience you may have in applying or interpreting 10 CFR § 50.55(e) and in applying or interpreting 10 CFR Part 50 Appendix B.

A.8 As Manager of Nuclear Standards and Quality Assurance for the Power Industrial Division of Bechtel Corporation during 1969-72 and Manager of Quality Assurance for the Thermal Power Organizaiton of Bechtel Power Corporation, I coordinated the corporate review of proposed 10 CFR § 50.55(e) and developed Bechtel Power Corporation's initial procedures for implementing 10 CFR § 50.55(e). Subsequently, I provided guidance to various divisions of Bechtel Power Corporation and their projects on specific reportability questions. Furthermore, as the

Project Licensing Manager and Assistant Project Manager-Systems for STP during 1982-83, I served as the Bechtel project management representative for determining the reportability of a number of Bechtel-identified design deficiencies.

I have also served for more than 14 of the last 16 years as Chairman or a member of the Nuclear Quality Assurance Standards Committees that produced various ANSI QA standards adopted in the NRC regulatory guides. Furthermore, I was responsible for developing Bechtel Power Corporation division and corporate QA programs which implement NRC requirements. Additional relevant QA experience is described in my statement of professional qualifications.

Q.9 Mr. Lopez, please describe any experience you may have in applying or interpreting 10 CFR § 50.55(e) and in applying or interpreting 10 CFR Part 50, Appendix B.

A.9 For the past eleven years, I have worked in various assignments on nuclear power plant projects. These include three domestic nuclear projects and two foreign projects. All of these projects were committed to the application of these U.S. federal regulations to the conduct of activities with which I was involved (although the foreign projects had no formal requirement to report deficiencies to the NRC). As a member or supervisor of the Nuclear Engineering discipline on

these projects, I was trained in the process of identifying, evaluating and dispositioning reportable deficiencies in accordance with 10 CFR § 50.55(e). In addition, each of these projects worked under the procedures established in its quality assurance program to meet the requirements of 10 CFR Part 50, Appendix B, and I was often called upon to assist in the determination of acceptable compliance with this regulation. In particular, on the South Texas Project, my duties have included supervision of the Quality Engineering discipline which is responsible for the development, monitoring and maintenance of all Engineering Department procedures related to meeting the project's QA commitments. This supervisory responsibility also included acting as the primary representative of the Bechtel Project Engineering Manager (PEM) in interfacing with other departments relative to quality matters, including the Bechtel and HL&P Quality Assurance Departments. With respect to reportability determinations under 10 CFR § 50.55(e), the Bechtel PEM designated me to act as his primary representative in reviewing, evaluating and dispositioning all Deficiency Evaluation Reports generated by the Project in order to assure complete and consistent application of the Project's procedures on

reportability. I held this responsibility from the beginning of the Bechtel involvement on the Project until approximately one year ago.

Q.10 Dr. Bernsen, in addition to the work you have done to prepare this testimony, have you conducted any reviews of the findings in the Quadrex Report?

A.10 Yes. In 1982, the Bechtel Power Corporation Task Force conducted an assessment of the findings in the Quadrex Report in order to recommend management and design actions to resolve the findings in a timely manner. The results of this assessment were presented in "An Assessment of the Findings in the Quadrex Corporation Report" (March 1982) (Applicants' Exhibit 63). Among other things, this report identified the discipline findings in the Quadrex Report which the Bechtel Power Corporation Task Force thought may be potentially reportable under 10 CFR § 50.55(e). I participated in a Bechtel Power Corporation management review of the draft report prepared by the Bechtel Power Corporation Task Force to confirm the accuracy and reasonableness of the conclusions presented in the draft. I also served as a member of the Bechtel STP Project management team with overview responsibility for EN-619, the "Review of the Quadrex Report" (Applicants' Exhibit 64).

Q.11 Dr. Bernsen, was the Bechtel Power Corporation Task Force report (Applicants' Exhibit 63) true and correct to the best of your knowledge, information and belief when the report was issued?

A.11 Yes. It may be noted that Bechtel has learned of additional information since the issuance of the Bechtel Power Corporation Task Force Report which has led Bechtel to a different conclusion with respect to findings 4.3.2.1(a) and 4.8.2.1(a) than is stated in the Report, as we discuss below.

Q.12 Mr. Lopez, in addition to the work you have done to prepare this testimony, have you conducted any reviews of the findings in the Quadrex Report?

A.12 Yes. In 1982, I was employed by Bechtel as the Nuclear Engineering Group Supervisor at STP. My responsibilities in this position included direction and supervision of preparation of various work packages associated with the transition from Brown & Root (B&R) as architect-engineer/constructor to Bechtel as architect-engineer/construction manager and Ebasco as constructor. Among those work packages was EN-619, entitled "Review of the Quadrex Report" (Applicants' Exhibit 64).

The purpose of EN-619 was to establish a program for the evaluation and disposition of the findings in the Quadrex Report. The primary purpose of EN-619 was not

to review the Quadrex findings to determine their reportability. However, Bechtel, in its overall design review, was alert to identify any reportable deficiency arising from the Quadrex Report (and in fact, EN-619 identifies relevant Deficiency Evaluation Reports). EN-619 did not focus upon Quadrex's comments on the practices, policies, and procedures of B&R because they were not applicable or germane to Bechtel's activities.

In some cases, the practices identified in the Quadrex Report were adopted by Bechtel. However, in other cases, EN-619 shows that Bechtel has not adopted the types of design practices apparently suggested by Quadrex but instead utilizes reasonable alternatives. Thus, EN-619 helps to indicate that a number of the findings in the Quadrex Report essentially state Quadrex's opinion as to good practice in accomplishing an efficient engineering process but do not identify practices which are required under Appendix B to 10 CFR Part 50.

Q.13 Mr. Lopez, was EN-619 (Applicants' Exhibit 64) true and correct to the best of your knowledge, information and belief when it was issued?

A.13 Yes. However, it should be noted that, among other things, EN-619 describes substantive activities to be undertaken by Bechtel to correct, prevent or address the

matters identified in the Quadrex Report. In a few cases, as the design has evolved, Bechtel's design activities and technical resolutions addressing matters raised in the Quadrex Report have been different than those projected in EN-619. None of these differences has any significance with respect to the reportability of the findings in the Quadrex Report.

Q.14 Please identify the Quadrex Report findings as to which you will be testifying.

A.14 The Quadrex Report findings on which we will be testifying may be divided into two groups. The first group consists of certain generic findings which the Licensing Board accepted for litigation at pages 12-13 of its Memorandum and Order of February 26, 1985, page 10 of its Sixth Prehearing Conference Order of May 17, 1985, and pages 1-2 of its Memorandum and Order of May 24, 1985. These findings are numbered 3.1(a) through 3.1(j). The second group consists of certain discipline findings identified in the Quadrex Report as "most serious" which the Licensing Board accepted for litigation at pages 13 and 16 of its Memorandum and Order of February 26, 1985, page 12 of the Sixth Prehearing Conference Order of May 17, 1985, and pages 1 and 2 of its Memorandum and Order of May 24, 1985. These findings are numbered 4.1.2.1(b), 4.3.2.1(a),

4.3.2.1(d), 4.3.2.1(n), 4.5.2.1(b), 4.6.2.1(n), 4.7.3.1(a), 4.7.3.1(b), 4.7.3.1(k), and 4.8.2.1(a) through 4.8.2.1(g).

Q.15 In performing your review for reportability under 10 CFR § 50.55(e), what information did you rely upon?

A.15 In a number of cases, we were able to determine that the findings, on their face, were not reportable under 10 CFR §50.55(e)(1)(i). In some cases, we also took into account the material in the Quadrex Report in determining whether the findings were reportable under 10 CFR § 50.55(e)(1)(i). Finally, in a few cases, we are aware of information, which Quadrex may not have possessed when it performed its review, which would indicate that Quadrex's findings were not reportable under 10 CFR § 50.55(e)(1)(i).

Q.16 What criteria did you utilize to determine whether the findings identified by the Licensing Board were reportable under 10 CFR § 50.55(e)(1)(i)?

A.16 A matter is reportable under 10 CFR § 50.55(e)(1)(i) only if it satisfies each of the following three criteria:

(1) a deficiency in design or construction must be identified;

(2) the deficiency must have the potential, if left uncorrected, to affect adversely the safety of plant operations; and

(3) the deficiency must represent a significant breakdown in any portion of the quality assurance program conducted in accordance with the requirements of Appendix B to 10 CFR Part 50.

In response to the Licensing Board's request to determine whether the findings identified by the Board identify a significant breakdown in any portion of the QA program for STP, we have focused primarily upon the third criterion listed above and have determined that none of the findings (except those actually reported to the NRC) identified by the Board satisfies this criterion. Consequently, we have concluded that no additional findings would be reportable under 10 CFR § 50.55(e)(1)(i). Finally, it may be noted that there may be reasons in addition to those discussed in this testimony why a particular finding is not reportable under 10 CFR § 50.55(e)(1)(i).

In determining whether a finding indicates the existence of a significant breakdown in any portion of the QA program for STP which may be reportable under 10 CFR § 50.55(e)(1)(i), it is important to keep the following consideration in mind. Appendix B to 10 CFR Part 50 sets forth general criteria governing quality

assurance for design, construction, and operation of structures, systems, and components which perform safety-related functions. Thus, while Appendix B identifies measures which must be established and implemented, it allows a licensee to exercise discretion in deciding which specific practices are most appropriate for its project. Accordingly, as long as a licensee has acceptable controls in place, the fact that a licensee does not utilize a particular procedure, document, or other specific method for controlling design activities does not indicate a significant breakdown in the quality assurance program.

It is also noted that the determination of whether a significant breakdown exists in any portion of the quality assurance program that could lead to a report to the Commission under 10 CFR ¶ 50.55(e)(1)(i) is not a straight-forward process, since there are no firm criteria available for making this determination. It is particularly difficult to make this determination with respect to deficiencies related to design, because of the iterative nature of the design process, the need to rely on preliminary assumptions or judgment that occasionally may be found nonconservative, the changing standards of performance, and the evolution of analytical techniques and documentation that have occurred over the past decade or more. If conditions are found where an explicit requirement of 10 CFR Part

50, Appendix B or an applicant's quality assurance program are clearly and significantly not implemented, or where required verification or checking processes are repeatedly ignored, the determination can be rather obvious. In other areas, such as questions regarding the adequacy of preliminary assumptions, the level of detail in criteria, the timeliness or degree of sophistication in analysis, or the relative effectiveness of organizational relationships, the determination is much more complex. We would recommend reporting questionable cases involving any deficiencies in the process of design that could adversely affect the safety of operations as measured by sound engineering judgment, whether or not the design had been released for construction. We believe this has been and continues to be the general philosophy applied on the South Texas Project and has formed the basis for our testimony.

Q.17 Please describe the format you will use in addressing each generic finding.

A.17 First, we will identify the primary concerns contained in the finding. Next, we will discuss whether these concerns indicate the existence of a significant breakdown in the QA program for STP. Finally, we will address the statements of CCANP with respect to the finding.

Q.18 What concerns are expressed in finding 3.1(a)?

A.18 Finding 3.1(a) primarily expresses two concerns of Quadrex. First, Quadrex was concerned that an effective systems integration and overview function and systems engineering function may not exist at the STP. Second, Quadrex was concerned about the absence of multidisciplinary design guidance at STP for separation and the single failure criterion and that each discipline was providing its own interpretation and acceptance criteria.

Q.19 What are a systems integration and overview function and a systems engineering function?

A.19 A systems integration and overview function generally refers to the responsibility for assuring that factors such as system interactions, the impacts which one system may have upon another system, and the compatibility of one system with an interfacing system are accounted for. For example, one systems integration function which nuclear projects address by one method or another is an analysis of the potential interactions which might exist between non-safety related systems and safety-related-systems. In such an analysis, one might evaluate the safety impact of the failure of non-seismically supported components as a result of postulated earthquakes. In order to perform this evaluation, the analyst would need to become familiar

with the design and relative locations of both safety-related and non-safety-related systems and components. Such an evaluation necessarily goes beyond the level of understanding needed to design an individual system or component.

Another example of a systems integration function which is common in power plant design is the interdisciplinary coordination which is needed to identify, design and verify the relationship between primary process systems and their support systems, such as HVAC, lighting, power supply and other services. In the initial phases of design activity, the required support services are identified and, in normal practice, assumptions are made about interface requirements such as heat loads, service conditions, and power requirements. As design of both the primary and support systems progresses, the need increases to confirm the validity of the assumptions made in the preliminary stages of design. That need is fulfilled by some method of interdisciplinary coordination, often referred to as a systems integration or systems engineering function.

Common between these two examples are the multi-disciplinary aspects of the design activity, and the iterative nature of the approach which involves some set of preliminary interfacing assumptions coupled with activities in the latter stages of design or construction to confirm the validity of the assumptions.

A systems engineering function generally refers to the responsibility for determining multidisciplinary design requirements applicable to a particular system. For example, individuals performing a systems engineering function would have responsibility for ensuring specification of the functional requirements applicable to a system, such as the operating temperatures, head requirements, and instrumentation requirements for a fluid system.

Q.20 Did B&R have a systems integration and overview function?

A.20 Yes. Among other things, we understand that B&R established a Systems Design Assurance Group at STP in February of 1980 to provide a systems integration and overview function. As indicated by Quadrex to the Bechtel Power Corporation Task Force, the Quadrex Report did not include a review of the activities of this group. The activities performed by the group may not have been evident to Quadrex because we understand that most of the reviews performed by the group had not yet been factored into revisions of the design documents being reviewed by Quadrex.

Q.21 Does the fact that B&R did not establish the Systems Design Assurance Group until 1980 indicate a significant breakdown in any portion of the QA program for STP?

A.21 No. Such a group is not a necessary element of a design control process. Other measures to assure adequate systems integration are often used. The need for a systems integration and overview function becomes more important as the design of a plant progresses. During the early stages of design, systems interactions are not well-defined due to the preliminary nature of the design. Consequently, at this stage of design, systems integration does not play a significant role, and the measures that we understand were employed by B&R (e.g., use of System Design Description (SDDs), Technical Reference Documents (TRDs), and multidisciplinary review and comment) provide appropriate methods of integration controls. As the design evolves and systems interactions can be determined with greater precision, the need for controls for systems integration becomes more acute since this function plays a greater role in design. B&R recognized this, and its approach to handling this need was the establishment of the Systems Design Assurance Group in 1980. The fact that this group was not established before that time does not indicate a significant breakdown in any portion of the QA program for STP, but simply reflects the iterative nature of the design process.

Q.22 Did B&R have a systems engineering function?

A.22 Yes. We understand that B&R did have a systems engineering function at STP. This consisted of such measures as designating engineers within various disciplines to coordinate the development of system descriptions, including System Design Descriptions (SDDs), Piping and Instrumentation Diagrams (P&IDs), and other documents which specified multidisciplinary requirements applicable to a system. These documents provide evidence of the existence of that function. Furthermore, B&R enhanced the systems engineering function through multidisciplinary review of and comment on design documents. These measures are typical of those used by the industry at that time.

In recent years, some architect-engineering companies have begun to establish systems engineering groups to significantly augment the systems engineering function. The Systems Design Assurance Group established by B&R in 1980 was in accord with this movement. However, Quadrex did not review the activities of this group.

Q.23 Does the Quadrex Report identify significant deficiencies in design related to B&R's systems integration and overview function and systems engineering function?

A.23 Yes, but the deficiencies were limited those reported to the NRC. We have reviewed the information in the Quadrex Report to determine whether Quadrex identified any other deficiencies in design related to systems integration and systems engineering. Quadrex did not identify any significant deficiencies in design with the exception of those which were reported to the NRC. Consequently, we conclude that the Quadrex Report does not identify a significant breakdown in B&R's systems integration and systems engineering beyond the deficiencies which were reported.

Q.24 In general, did B&R have multidisciplinary design guidance for STP?

A.24 Yes. We understand that, in general, B&R did have a program to provide multidisciplinary design guidance. In addition to its System Design Descriptions (SDDs), which pertained to individual systems, B&R also utilized Technical Reference Documents (TRDs), most of which applied across systems and disciplines. Additionally, B&R procedure STP-SD-005-B required the Systems Design Assurance Group to perform reviews encompassing several systems and disciplines in order to assure the compatibility of the design work performed by the various disciplines.

Q.25 Please explain whether Quadrex's concern about the absence of multidisciplinary design guidance for separation and single failure criterion indicates a significant breakdown in any portion of the QA program for STP.

A.25 Criterion III of Appendix B requires that measures "be established to assure that applicable regulatory requirements and the design basis... are correctly translated into specifications, drawings, procedures, and instructions." There are many acceptable methods of satisfying this requirement, including the use of multidisciplinary design guidance or the use of guidance applicable to a specific discipline. However, Appendix B does not require the use of multidisciplinary design guidance, nor does it require that each discipline utilize the same design criteria for its work as are being used by other disciplines on their work. As long as the criteria being utilized by each discipline are appropriately conservative for the work it is doing, and as long as the final designs of the systems are compatible, as confirmed during verification activities, the lack of multidisciplinary design guidance would not be indicative of a significant breakdown in any portion of the QA program.

We have reviewed the information in the Quadrex Report to determine whether Quadrex identified any deficiencies in design related to separation or the

single failure criterion. Quadrex did not identify any concerns in this regard with the exception of questioning the design of the common instrument air line in the Fuel Handling Building (FHB) HVAC system. Similarly, the Bechtel review of the B&R design during the transition period did not identify any significant problems related to separation or the single failure criterion. Consequently, we conclude that there was no significant breakdown concerning the design guidance provided by B&R related to separation or the single failure criterion.

Q.26 "Citizens Concerned About Nuclear Power Motion To File Additional Contentions Based On New Information And To Establish A Discovery And Hearing Schedule With Respect To New Contentions" (November 21, 1981) (CCANP's Motion), pp. 16 and 41, quotes three sentences from finding 3.1(a) as identifying a violation of Criterion III of Appendix B to 10 C.F.R. Part 50. These sentences are as follows:

> "There is no indication that an effective systems integration and overview function exists within the B&R design process."
>
> "HL&P has indicated that their organizational structure is closely aligned with that of B&R, and that no systems engineering function exists within the utility either."
>
> "A working interface relationship among the disciplines is not routine particularly regarding follow-through at the discipline input-output interface."

In particular, CCANP states that these sentences identify a violation of the requirement in Criterion III, which states that "[m]easures shall be established for the identification and control of design interfaces and for coordination among participating design organizations." See CCANP's Motion, p. 16. Did B&R have measures for controlling design interfaces?

A.26 Yes. For example, B&R had several procedures intended to control the interfaces that exist between various organizations. These included STP-SD-004, Engineering Procedure for Design Reviews, STP-SD-005, System Design Assurance Reviews, and STP-DC-014, Document Review Comment Procedure. In combination, these procedures established formal requirements for conducting interfacing activities, including a review and comment process for design and vendor documents and a process for conducting design review meetings. A separate process for performing design assurance reviews designed to assure that system design requirements and interfaces were properly identified and implemented was a part of this interface control. Each of these processes included requirements for documentation of the activities undertaken.

Q.27 Please explain whether the first two sentences quoted by CCANP indicate a significant breakdown in the interface controls for STP?

A.27 Criterion III of Appendix B to 10 CFR Part 50 requires that design interfaces be controlled. However, with the exception of requiring "procedures among participating design organizations for the review, approval, release, distribution, and revision of documents involving design interfaces," Criterion III does not specify how design interfaces shall be controlled. Thus, the means by which design interfaces are controlled is left to the discretion of the licensee and its contractors.

Design interfaces may be controlled by various methods, such as assigning discrete responsibilities to various individuals and organizations, establishing lines of communication which identify responsibilities for decision-making and resolution of problems, and establishing procedures to control the flow and review of design information. Thus, a systems integration function and a systems engineering function in the form of discrete functional groups are not necessary means of controlling design interfaces.

As we have discussed above, B&R did have appropriate procedures to control design interfaces. Furthermore, B&R did have a systems integration function and a systems engineering function, and it had taken action to strengthen these functions by establishing the Systems Design Assurance Group (the activities of which Quadrex did not review). With the exception of the reported deficiencies, Quadrex did not identify any significant

deficiencies in design attributable to B&R's process for design interface control. Consequently, the two sentences quoted by Quadrex do not indicate a significant breakdown in the control of design interfaces for STP beyond the deficiencies actually reported.

Q.28 What is the basis for the sentence which states that "[a] working interface relationship among the disciplines is not routine particularly regarding follow-through at the discipline input-output interface"?

A.28 This sentence is part of a paragraph which pertains to systems engineering. It appears that Quadrex was seeking greater informal communication among disciplines designing a system so that each discipline knew what the other disciplines were doing. In particular, Quadrex observed that a discipline supplying data to another discipline was not checking to see that the data were being properly used.

Q.29 Does this indicate a significant breakdown in the design interface controls for STP?

A.29 No. As we discussed previously, B&R had appropriate procedures to control interfaces and had a systems engineering function, including the Systems Design Assurance Group which Quadrex did not review. There are

benefits in terms of efficiency in routine informal communication among disciplines. However, the QA program contained appropriate measures (such as design review meetings, document review and comment, reviews provided by the Systems Design Assurance Group, and design verification) designed to provide assurance that the multidisciplinary aspects of a system were properly accounted for and coordinated. In particular, it is not normal practice for a discipline supplying input data to ensure that the recipient of the data uses it correctly, although the discipline which supplies data may review the other disciplines' design output documents as part of the coordination process.

Q.30 CCANP's Motion, p. 42, quotes the following sentence from finding 3.1(a) as identifying a violation of Criterion VI of Appendix B to 10 C.F.R. Part 50:

> "A major concern is with the achievement of internal consistency among various design documents and the maintenance of that consistency over time with personnel turnover."

CCANP states that this sentence demonstrates a failure "to adequately control the issuance of documents, such as instructions, procedures, and drawings, including changes thereto." Id. What was the nature of the concern expressed in this sentence?

A.30 As is apparent from the context in which it arises, this sentence relates to system integration. Additionally, this sentence appears to relate to Quadrex's concern that there was not a single set of multidisciplinary design criteria applicable to all disciplines, and that each discipline was establishing design criteria applicable to the work it was doing.

Q.31 Do these concerns indicate the existence of a significant breakdown in any portion of the QA program for STP?

A.31 No. It appears to have been Quadrex's concern that future design activities might not be as performed as efficiently or as consistently as they might be with a more effective systems integration and overview function. As we discussed previously, Quadrex's concern in this area did not indicate a significant breakdown in any portion of the QA program for STP.

Similarly, as we explained previously, use of multidisciplinary design guidance is not required by Appendix B. Furthermore, Criterion VI of Appendix B is not relevant to this concern, since Criterion VI only applies to the control of issuance and distribution of documents which prescribe activities affecting quality. Criterion VI does not require the issuance of a

particular type of design criteria, nor does it require that each design discipline use the same design criteria.

Q.32 CCANP's Motion p. 40, quotes the following sentences from finding 3.1(a) as identifying a violation of Criteria II and XVII of Appendix B to 10 C.F.R. Part 50:

> "There is no indication that an effective systems integration and overview function exists within the B&R design process . . . . A major concern is with the achievement of internal consistency among various design documents and the maintenance of that consistency over time with personnel turnover."

CCANP states that these sentences demonstrate a failure "to assure adequate documentation in an identifiable and retrievable manner of the safety-related design and engineering work" at STP. Id. What relevance, if any, do these sentences have to Criterion XVII?

A.32 These sentences do not relate to the maintenance of quality assurance records, which is the subject of Criterion XVII. In particular, these sentences do not indicate that B&R failed to maintain records for activities affecting quality. Consequently, these sentences do not establish that any violation of Criterion XVII occurred.

Q.33 Do these sentences indicate a significant breakdown in any portion of the quality assurance program for STP under Criterion II of Appendix B?

A.33 No. B&R had various procedures designed to provide a system integration function, including its newly established System Design Assurance Group. However, most of the activities of this group had not yet been factored into the design documents reviewed by Quadrex. As we discussed previously, this fact does not identify a significant breakdown in any portion of the quality assurance program for STP but only indicates that B&R had not yet completed this activity.

Similarly, when read in context, the statement regarding consistency among design documents also reflects a concern about the lack of multidisciplinary design guidance. As we discussed previously, none of the criteria of Appendix B (including Criterion II) specifically requires the use of multidisciplinary design guidance, provided that other appropriate measures exist to ensure that applicable requirements and design bases are correctly translated into specifications, procedures, and instructions.

Q.34 Does finding 3.1(a) identify a significant breakdown in any portion of the QA program for STP?

A.34 No. As we have discussed previously, finding 3.1(a) does not identify a significant breakdown in any portion of the QA program for STP.

Q.35 What concerns are expressed in finding 3.1(b)?

A.35 Finding 3.1(b) primarily expresses four concerns. First, Quadrex was concerned that calculations containing errors were being verified as correct with a higher frequency than should be encountered. Second, Quadrex was concerned that design input was not being consistently reviewed for reasonableness by the recipient and that the use of design output was not being consistently checked by the group providing it. Third, Quadrex was concerned that B&R was not providing adequate guidance to vendors relative to acceptable analysis and testing methods, required data, and report format. Finally, Quadrex was concerned that B&R was not verifying work performed by subcontractors and vendors, was not reviewing and approving the analysis methods used by subcontractors and vendors, and did not have documented criteria governing the evaluation process for vendor reports.

Q.36 Please explain whether Quadrex's finding that calculations containing errors were being verified as correct with a higher frequency than should be encountered indicates a significant breakdown in any portion of the QA program for STP.

A.36 In order to determine the extent of this Quadrex concern, we have reviewed the information cited by Quadrex as support for its statement that calculations containing errors were being verified as correct with a higher frequency than should be encountered. The Quadrex Report cites Questions C-16, H-15, N-1, and N-17:

- Quadrex's assessment in C-16 states that B&R's design verification procedures "appeared to be adequate or above industry standards on paper." Nevertheless, Quadrex noted that it was "unable to evaluate the effectiveness of their procedure" and that there was "evidence" that a "significant number of mistakes" passed through the verification process.
- Quadrex's assessment in H-15 states that the reactor cavity cooling system pressure drop calculation "does not take into account the effects of restrictions to air flow within the reactor cavity."

- Quadrex's assessment in N-1 is critical of B&R for accepting an analysis of a main steam line break (MSLB) which it knew had a large conservative error. With this exception, Quadrex found that the "verification sheets showed proper verification procedures."
- Quadrex's assessment in N-17 states that "[t]here appears to be either an error in the calculation of ECP [essential cooling pond] initial temperature or an inconsistency with Heavy Civil calculations."

H-15 identifies only one error; however, this error had been identified prior to the Quadrex review and in fact was in part the subject of an earlier 50.55(e) report (see letter from G.W. Oprea to Karl Seyfrit (November 11, 1980)). N-1 also identifies only one error, but it was previously identified and was accepted because it was conservative. Quadrex was not able to determine in N-17 whether any error existed in a calculation (in fact, N-17 did not involve an error but only the use of different but conservative assumptions by different disciplines). C-16 does state that there was evidence of a "significant number" of mistakes, but Quadrex does not identify these mistakes, their number or the number of verified calculations it reviewed, nor does it describe the nature or significance of the mistakes it discovered. Furthermore, in C-16, Quadrex states that

it was unable to evaluate the effectiveness of B&R's verification procedure. Thus, the information provided by Quadrex in the C-16, H-15, N-1, and N-17 is not sufficient to support an independent determination that a significant breakdown occurred in verification of design at STP.

In this regard, it should be noted that, during the course of design and construction of any project as extensive and complex as a nuclear power plant, some calculational errors will inevitably occur. Quality assurance programs are designed to catch, minimize, and control calculational errors in design through such measures as checking, verification, inspections, tests, and audits. However, it is unreasonable to expect a QA program to preclude all calculational errors. Consequently, the fact that a few calculational errors are identified does not necessarily establish that there was a significant breakdown in any portion of the quality assurance program.

Furthermore, we have reviewed the Quadrex Report to identify whether other information in the report might indicate a significant breakdown in the process of performing or verifying calculations at STP. With the exception of the deficiencies which were reported to the NRC, no design errors with adverse safety implications were identified by Quadrex.

Finally, with respect to calculations in the civil area addressed in Question C-16, the civil/structural aspects of design and construction were the most advanced at the time of the transition from B&R to Bechtel. As a result, Bechtel civil/structural engineering personnel reviewed the existing B&R calculations to determine their technical adequacy to support the design of structures. These personnel generally observed that, although the analytical methods utilized by B&R were not the same as normal Bechtel practice, the relatively high degree of conservatism used in the B&R analyses produced an end product in the design which was technically acceptable without redesign or reanalysis.

Q.37 Does Quadrex's concern that a recipient does not consistently review the reasonableness of input data provided to it or that the provider of output data does not consistently check the use of that data indicate a significant breakdown in any portion of the QA program for STP?

A.37 No. The adequacy of data provided across design interfaces is assured through such measures as interdisciplinary document reviews and through design verification. As we discussed previously, B&R did have appropriate procedures for conducting these activities,

and Quadrex did not identify any significant deficiencies related to interfaces controls which were not reported to the NRC.

It is not normal industry practice to require a supplier of data to perform a formal review of the use of that data by the recipient, although the discipline which supplies data may review the other disciplines' design output documents as part of the coordination process. Although it is good practice to have the recipient of data perform an informal review of the reasonableness of input data, in many cases the recipient does not have either the knowledge or experience necessary to conduct such reviews. Accordingly, such reviews of input data are generally not part of a licensee's QA program.

Q.38 Does the absence of guidance to vendors relative to acceptable analysis and testing methods, required data, and report format indicate a significant breakdown in any portion of the QA program for STP?

A.38 No. Criterion IV of Appendix B requires that procurement documents include or reference "applicable regulatory requirements, design bases, and other requirements which are necessary to assure adequate quality." In general, the "other requirements" may include reference to specific drawings, specifications, codes, or test, inspection, and acceptance requirements.

Detailed guidance on "analysis and testing methods, required data, and report format," may be, but are not required under Criterion IV to be, included in procurement documents. Such details may be left to the discretion of the vendors since the vendors are often in the best position to know which types of methods or reports best satisfy the quality requirements of the purchaser. In other words, procurement documents generally specify the criteria which a product must meet, and the vendor usually has discretion to determine how to satisfy those criteria.

Specifically, B&R procedure STP-DC-005, Preparation and Control of Specifications, provided guidance to personnel responsible for developing the design documents which are issued for the purpose of identifying the technical requirements to be met by vendors and subcontractors. This procedure describes the types of information requirements which B&R engineers should provide to the vendor/subcontractor and the types of documents which are to be required from the vendor/subcontractor. The procedure provides the following the specific guidance with respect to special or unusual interface requirements or conditions for subcontracted engineering services: "Unless the requirement is essential to the performance of that task, the requirement <u>should not be</u> included." (Emphasis in Original) In our experience, the type of practice

embodied in this procedure has proven a generally satisfactory means of obtaining appropriate products in a cost-effective manner.

It may be noted that, in addition to the requirements specified in the procurement documents, for some types of procurements purchasers often provide guidance to vendors identifying one or more acceptable means by which the requirements in the procurement documents may be satisfied. Although such guidance is not required, it helps avoid a situation in which a vendor may satisfy all of the quality requirements in the procurement documents and yet not provide a product or service in a form that is useful to the purchaser.

Q.39 Does Quadrex's concern that B&R was not verifying work performed by subcontractors and vendors, was not reviewing and approving the analysis methods used by subcontractors and vendors, and did not have documented criteria governing the evaluation process for vendor reports indicate a significant breakdown in the QA program for STP?

A.39 No. It appears that Quadrex was concerned with the extent to which B&R was performing these functions rather than their total absence. Review of work performed by vendors and contractors is encompassed within the scope of Criterion VII of Appendix B. Criterion VII requires that measures be established to

assure that purchased services conform to procurement documents. Other than stating that "[t]hese measures shall include provisions, as appropriate, for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor, inspection at the contractor or subcontractor source, and examination of products upon delivery," Criterion VII does not identify which measures must be used to assure that purchased services conform to procurement documents, but instead allows the purchaser to select the measures it deems appropriate.

Typically, purchasers confirm the adequacy of the activities of their suppliers by conducting reviews of selected procedures, audits, surveillances, and reviews at vendor shops and inspections of products upon delivery. Suppliers of safety-related services are required to provide an approved quality assurance program to the extent necessary for their activities which affect quality. In general, review and monitoring of a supplier's QA program provides confidence in the quality of the work of the supplier.

Criterion VII does not require a purchaser to verify (in the sense of a detailed check or design review) work performed by subcontractors and vendors. Verification by the purchaser could be used as one means of satisfying Criterion VII. However, in many cases, it would not be possible for a purchaser to verify the work

performed by a subcontractor or vendor. Subcontractors or vendors often possess specialized knowledge and abilities which are necessary for verification but are lacked by the purchaser (which may be the very reason why the purchaser did not perform the design activities itself). In such cases, the subcontractor or vendor typically would verify its own work in accordance with its own QA program, and the purchaser would rely upon other measures to assure that the work satisfies the requirements in the procurement documents. In short, a purchaser is only required to assure that purchased services conform to procurement documents; the purchaser is not required to perform design verification of the work performed by subcontractors and vendors and in most cases it would be impracticable to do so.

Similarly, neither Criterion VII nor Appendix B in general requires that a purchaser review and approve the analysis methods used by subcontractors and vendors. As explained previously, purchasers are not required to specify analysis methods in procurement documents, and in many cases purchasers (including B&R) do not do so. Furthermore, although a purchaser may rely upon a review of a supplier's analysis methods as a means of assuring that purchased services conform with procurement documents, there are other acceptable alternatives for providing this assurance. These measures include the use of audits and surveillances and review of objective

evidence of conformance with the procurement document requirements, such as certificiations by appropriate registered engineers.

Finally, it may be noted that B&R did have documented procedures governing the reviews of vendor reports. B&R procedure STP-DC-004 required that vendor reports be reviewed in accordance with procedure STP-DC-014. Additionally, among other things, STP-DC-004 required that such reviews include a determination of whether the vendor has met the requirements of the procurement documents. This procedure is sufficient to satisfy the requirements of Appendix B. Also, it may be noted that the Quadrex Report did not identify significant safety deficiencies in the work performed by subcontractors and vendors. However, we would agree with Quadrex that it is good practice to provide additional guidance for the review of vendor reports.

Q.40 CCANP's Motion, p. 39, quotes the following sentence from finding 3.1(b) as identifying a violation of Criteria I and XVIII of Appendix B to 10 C.F.R. Part 50:

> "Input data to a technical group does not appear to be consistently reviewed by that group for its reasonableness prior to use."

CCANP states that this sentence demonstrates a failure "to adequately verify safety-related design and engineering work" at STP. Id. What relevance, if any, does this sentence, or design verification in general, have to Criteria I and XVIII?

A.40 This sentence, and design verification in general, are not relevant to Criteria I and XVIII. Criterion I requires the responsibilities of organizations performing activities affecting quality to be established in writing, and it sets forth certain requirements with respect to those responsibilities. Criterion I does not specify which organization shall verify or review design input. Similarly, Criterion XVIII requires that a comprehensive system of planned and periodic audits be carried out to verify compliance with and the effectiveness of the quality assurance program. Criterion XVIII does not impose any requirements with respect to verification or review of design input. To the extent any question about verification of design can be inferred from this sentence quoted by CCANP, it would be encompassed generally within Criterion III, not Criterion I or XVIII.

As is discussed above, the sentence quoted by CCANP does not indicate a significant breakdown in any portion of the QA program for STP. While Criterion

III requires that measures shall be established for verifying or checking the adequacy of design; it does not prescribe who shall perform the verification or check. Thus, under Criterion III, the organization which provides the design input may, and often does, verify the adequacy of the input without additional verification by the recipient organization.

Q.41 CCANP's Motion, p. 41, quotes the following sentence from finding 3.1(b) as identifying a violation of Criterion IV of Appendix B to 10 C.F.R. Part 50:

> "Brown and Root does not provide adequate guidance to vendors stipulating acceptable analysis and testing methods, required data, and report format."

CCANP states that this sentence demonstrates a failure "to assure that applicable regulatory requirements, design bases, and other requirements for design and engineering of the South Texas Project were included or referenced" in procurement documents. Id. Does the sentence quoted by CCANP indicate that B&R failed to specify applicable regulatory requirements, design bases, and other requirements in the procurement documents?

A.41 No. The sentence quoted by CCANP only provides Quadrex's view regarding guidance given to vendors. As we discussed previously, this sentence does not

identify any failure to specify applicable regulatory requirements, design bases, and other requirements in procurement documents.

Q.42 CCANP's Motion, p. 43, quotes the following sentences from finding 3.1(b) as identifying a violation of Criterion X of Appendix B to 10 C.F.R. Part 50:

> "No documented criteria exists governing the evaluation process for vendor reports."
>
> "Brown and Root continues to pursue a policy that work performed by major subcontractors or suppliers, such as EDS Nuclear and Westinghouse, is design verified by these firms and can therefore be assumed to be correct."

CCANP states that these sentences demonstrate a failure "to establish and execute effectively a program for inspection of safety-related design and engineering work." Id. Please explain whether these sentences indicate a significant breakdown in inspection of design work under Criterion X.

A.42 Inspection refers to examinations, observations, measurements, or tests to determine whether the physical characteristics of a material, structure, component, system, or process comply with applicable requirements. Consequently, Criterion X is generally understood to identify requirements pertaining to inspections of fabrication and construction activities and not to design activities.

The criteria of Appendix B which are most applicable to the statement by CCANP are Criteria III and VII. The conformance of a design with applicable criteria is determined by means of verification under Criterion III and review of vendor-furnished information under Criterion VII. As we previously explained, the sentences quoted by CCANP do not identify a significant breakdown in the QA program for STP under Criterion III and VII.

Q.43 Does finding 3.1(b) identify a significant breakdown in any portion of the QA program for STP?

A.43 No. As we have discussed previously, finding 3.1(b) does not identify a significant breakdown in any portion of the quality assurance program for STP.

Q.44 What concerns are expressed in finding 3.1(c)?

A.44 Finding 3.1(c) primarily expresses three concerns of Quadrex. First Quadrex was concerned about the lack of consistent treatment of plant operating modes and environmental conditions and noted the absence of written design bases to guide designers in what combination of events and plant modes must be considered. Second, Quadrex was concerned that the design criteria for STP appeared to reflect industry issues in the 1973-75 time frame but not more recent

issues. Finally, Quadrex was concerned that analyses of certain systems did not reflect appropriate plant operating modes and environmental conditions.

Q.45 What is the source of Quadrex's first concern?

A.45 Although the Quadrex Report does not specify the source of this concern, it appears to be predicated upon finding 4.3.2.1(i), which states that "there is no project-wide documented basis for [plant operating and environmental] conditions and their use."

Q.46 Would the absence of a project-wide documented basis for plant operating and environmental conditions violate the requirements of Appendix B?

A.46 No. There is no requirement in Appendix B that plant operating and environmental conditions be specified in a project-wide document. At STP, the design bases were provided for individual systems or disciplines by System Design Descriptions (SDDs) and Technical Reference Documents (TRDs). In fact, B&R procedure STP-SD-002-B required SDDs to address off-normal and post-accident operating conditions and to list the casualty events considered in the design of systems. This practice is sufficient to satisfy the requirements of Appendix B. In this regard, it should be noted that B&R had established the Systems Design Assurance Group to assure, among other things, that

plant operating modes and environmental conditions were being properly accounted for from system to system.

Q.47 Does Quadrex's concern that the design criteria for STP appeared to reflect industry issues in the 1973-75 time frame but not more recent issues identify a significant breakdown in any portion of the QA program for STP?

A.47 No. Based upon our review of the Quadrex Report and Bechtel's review of B&R design work during the transition period, we have determined that B&R was reviewing regulatory and industry developments since 1975, but that in some cases B&R had not yet performed the work necessary to revise its design criteria. Thus, Quadrex's observation that the design criteria did not account for more recent developments does not indicate that the controls provided by the QA program were not being properly implemented but instead indicated that B&R had not yet updated its design criteria -- which at most could be considered a productivity and scheduling concern. This is particularly true since Quadrex did not identify significant deficiencies in design output traceable to out-of-date criteria.

Q.48 What is the basis for Quadrex's concern that the analyses of certain systems did not reflect appropriate plant operating modes and environmental conditions?

A.48 Quadrex relied upon three examples in support of its conclusion. First, Quadrex pointed to deficiencies in the design basis for the HVAC system. These deficiencies were reported to the NRC pursuant to 10 CFR § 50.55(e). The other examples involved a purported failure to consider the worst case conditions (i.e., simultaneous shutdown of two units) in the assumptions used in the design of the Essential Cooling Pond (ECP) and the absence of postulated line cracks and breaks outside of containment. However, the design of the ECP did in fact consider two units shutdown as reflected in FSAR Section 9.2.5., and we understand that B&R had not yet begun design activities associated with line cracks and breaks outside of containment.

Q.49 With the exception of the HVAC system design deficiency which was reported to the NRC, do these examples indicate a significant breakdown in the QA program for STP?

A.49 No. The questions about the ECP and the pipe break analysis were of a different nature than the deficiency in the HVAC system and do not suggest any

systematic deficiency in the controls provided by the QA program or in the implementation of those controls. Thus, these examples do not indicate the existence of a significant breakdown in any portion of the QA program for STP.

Q.50 CCANP's Motion, p. 42, quotes the following sentences from finding 3.1(c) as identifying a violation of Criterion V of Appendix B to 10 C.F.R. Part 50:

> "No written design bases are provided to guide the designer in what combinations of events and plant modes must be considered."
>
> "Consideration of degraded equipment performance was also not evident."

CCANP states that these sentences demonstrate a failure "to adequately prescribe by documented instructions, procedures, or drawings the safety-related design and engineering activities at the South Texas Project." Id. Please explain whether these sentences quoted by CCANP identify a significant breakdown in any portion of the QA program for STP.

A.50 Procedure STP-SD-002-B required that SDDs provide design bases for off-normal and post-accident conditions and list casualty events to be considered in the design of systems. As explained previously, Quadrex was apparently seeking a project-wide document which provided design bases for plant operating modes and environmental conditions. Neither Criterion III

nor Criterion V requires that a project-wide document specify the design basis for all systems or disciplines; both criteria permit the design basis to be identified on a system or discipline level. Additionally, the degraded equipment performance identified by Quadrex refers to matters that had not yet been the subject of design activities at STP. Thus, the sentences quoted by Quadrex do not identify a significant breakdown in any portion of the QA program for STP.

Q.51 CCANP's Motion, p. 42, quotes the following sentence from finding 3.1(c) as identifying a violation of Criterion VI of Appendix B to 10 C.F.R. Part 50:

> "Design criteria provided in issued [System] Design Descriptions (SDDs) and Technical Reference Documents (TRDs) . . . do not adequately address more recent developments," particularly developments in the post-1975 period.

CCANP states that this sentence demonstrates a failure "to adequately control the issuance of documents, such as instructions, procedures, and drawings, and changes thereto, which prescribed safety-related design and engineering." Id. Does the sentence quoted by CCANP identify a violation of Criterion VI?

A.51 No. Criterion VI pertains to document issuance to assure that when design documents and any revisions are updated, the revision process be appropriately

controlled by assuring that the revisions "are reviewed for adequacy and approved for release by authorized personnel and are distributed to and used at the location where the prescribed activity is performed." The sentence quoted by CCANP relates to the engineering design process of updating design documents relative to changing regulatory requirements, not the control process of issuing documents. Quadrex was expressing its view of the efficiency of B&R's design process in implementing new requirements.

Q.52 Does finding 3.1(c) identify a significant breakdown in any portion of the QA program for STP?

A.52 No. As we have discussed previously, finding 3.1(c) does not identify a significant breakdown in any portion of the quality assurance program for STP.

Q.53 What concerns are expressed in finding 3.1(d)?

A.53 Finding 3.1(d) primarily questions whether some design activities that were classified as non-safety-related should have been classified as safety-related, and it identifies seven examples in support of this conclusion.

Q.54 What were the seven examples identified in finding 3.1(d)?

A.54 The first example was stated as being "a lack of awareness of high energy piping in the MAB [Mechanical Auxiliary Building] (see Questions M-3, N-3, N-15, and R-5)." A review of the cited questions indicates that Quadrex was concerned that B&R had not analyzed postulated breaks in high energy lines in the MAB. This example does not involve an improper classification of a safety-related system but rather an activity which had not yet been performed by B&R.

The second example referred to shielding calculations that were not classified as safety-related. The NRC was notified that this was a potentially reportable deficiency under 10 CFR § 50.55(e). However, HL&P later determined that this was not reportable because the shielding calculations were not generally classified as safety-related in the industry and, more importantly, the shielding calculations were internally processed by B&R in the same manner as a safety-related calculation with respect to checking and verification of adequacy.

The third example involved "HVAC system requirements for off-normal conditions." Quadrex was concerned that B&R had not provided safety-related HVAC systems to account for off-normal conditions. This was reported to the NRC pursuant to 10 CFR § 50.55(e).

The fourth example involved "[c]omputer code CPVR status." Quadrex was concerned that users of computer codes could not determine whether the codes were safety-related or non-safety-related because some computer program verification reports (CPVR) were not in place. This was also reported to the NRC pursuant to 10 CFR § 50.55(e).

The fifth example involved "support systems (see Questions E-3, E-15, H-4, H-13, M-5, M-25, N-10, N-17, and R-6)." A review of the cited questions does not indicate any problem with safety-related classifications (with the exception of the HVAC problem mentioned previously), but instead generally indicates that Quadrex was concerned about various types of analyses which had not yet been completed or with analyses which Quadrex believed may have contained errors.

The sixth example involved "[o]perations performed at remote panels (see Questions E-13 and R-10)." A review of the cited questions does not indicate any problem with safety-related classifications of operations at remote panels but only a concern that environmental conditions (temperature, humidity, and radiation) at the remote panels may not have been properly accounted for. This example is related to

the reported deficiency in the HVAC systems, and pertained to activities which we understand had not yet been completed by B&R.

The final example involved "[s]ystems interaction (see Questions H-18, H-23, M-3, M-10, M-50, P-20, and R-12)." A review of the cited questions indicates that, with one exception (H-23), the questions do not involve improper safety-related classifications but instead analyses which we understand had not yet been completed or concerns by Quadrex regarding the adequacy of certain analyses. In Question H-23, Quadrex was questioning whether the leak detection instrumentation and sump pumps in the essential cooling water pump rooms should be classified as safety-related. Bechtel's review of this question revealed that level instrumentation was not the sole means of identifying leakage in the ECW system and as such did not have to be classified as safety-related. Furthermore, the operation of the sump pumps is not relied upon to mitigate against the consequences of postulated ECW system line breaks in such a way as to require their classification as a safety-related component.

Q.55 Do these seven examples indicate a significant breakdown in the safety-related classification system for STP?

A.55 No. Of the seven examples, only the one related to the HVAC system clearly involved a safety-related design activity that was improperly classified as non-safety-related. The other examples included analyses which we understand had not yet been completed and concerns about the adequacy of certain analyses. The isolated example involving the classification of portions of the HVAC system does not indicate a significant breakdown in the safety-related classification system for STP, and this example was in fact reported to the NRC pursuant to 10 CFR § 50.55(e).

Q.56 CCANP's Motion, pp. 39 and 41, quotes the following two passages from finding 3.1(d) as a basis for its contention that finding 3.1(d) violates Criteria I and II:

> "It was observed on many occasions that B&R uses a very sharp distinction between S/R and non-S/R categorizations for both equipment and calculations. A non-S/R designation results in the design outputs not being subjected to design verification. In several instances, design activities that affected plant safety were designated as non-S/R."
>
> "It was frequently stated during the design review that only NRC requirements must be met whether or not those requirements are accurate, reasonable, or even meet the intent of the regulations." (Emphasis as in the Quadrex Report).

CCANP states that these passages demonstrate a failure "to establish and effectively execute an acceptable quality assurance program" and a failure "to properly identify safety-related versus non-safety-related aspects of the design." Id. Do you have any comments regarding this contention?

A.56 Yes. Initially, it should be noted that drawing a sharp distinction between safety-related and non-safety-related classifications and failing to verify non-safety-related designs do not indicate any violation of Appendix B because Appendix B only applies to activities affecting the safety-related functions of structures, systems, and components. Furthermore, Criterion I of Appendix B is inapplicable to the quoted passages, since Criterion I only sets forth quality-related requirements for the organizations of a licensee and its contractors and does not specify any requirements regarding safety-related classifications. The criterion most directly applicable to the quoted passages is Criterion II, which requires among other things, that the "applicant shall identify the structures, systems and components to be covered by the quality assurance program. . . ."

Q.57 Do the passages cited by CCANP indicate a significant breakdown in quality assurance under Criterion II?

A.57 No. As previously explained, since Quadrex identified only one example of an improper designation of safety-related activities which was in fact reported to the NRC under 10 CFR § 50.55(e), there was no reasonable basis for notifying the NRC of a significant breakdown in any portion of the quality assurance program for STP.

Q.58 Does finding 3.1(d) identify a significant breakdown in any portion of the QA program for STP beyond the reported deficiency in the HVAC system?

A.58 No. As we have discussed previously, finding 3.1(d) does not indicate a significant breakdown in any portion of the quality assurance program for STP beyond the reported deficiency in the HVAC system.

Q.59 What concerns are expressed in finding 3.1(e)?

A.59 Finding 3.1(e) primarily expresses Quadrex's concern that written guidelines do not exist for the conduct of failure mode and effect analysis (FMEA) and that there is no documented evidence of satisfaction of the single failure criterion. Additionally, finding 3.1(e) identifies one case, involving the common instrument air line, which Quadrex indicated as a violation of the single failure criterion.

Q.60 Does this finding indicate a significant breakdown in any portion of the quality assurance program for STP?

A.60 No. First, it should be noted that, as we understand it, B&R had not begun to perform FMEAs for key systems (except for preparation of tables on single failures in the FSAR). Consequently, documented guidance for performance of FMEAs was not yet necessary, and therefore the absence of such guidance would not indicate a significant breakdown in any portion of the quality assurance program for STP.

It appears to have been Quadrex's opinion that a project-wide document should exist to provide guidance for the conduct of failure mode and effect analyses. See finding 4.3.2.1(i). As we explained previously with respect to finding 3.1(c), a project-wide document is not necessary as long as each discipline or group uses appropriate guidance for its specific type of work. Similarly, it is not necessary to have documented evidence solely for the purpose of demonstrating satisfaction of the single failure criterion provided that satisfaction can be determined from other documentation.

Finally, with respect to the single failure criterion violation reported by Quadrex in the common instrument air line, nothing in the Quadrex Report indicated that the situation involving the common instrument air line was attributable or related to a

significant breakdown in any portion of the QA program for STP. This matter is also the subject of findings 4.3.2.1(a) and 4.8.2.1(a), which are discussed below.

Q.61 CCANP's Motion, p. 42, quotes the following sentence as the basis for its contention that finding 3.1(e) identifies a violation of Criterion V of Appendix B to 10 C.F.R. Part 50:

> "No guidelines exist on what types of failures should be considered for various types of equipment."

CCANP states that this sentence demonstrates a failure "to adequately prescribe by documented instructions, procedures, or drawings the safety-related design and engineering activities at the South Texas Project." Id. Does the sentence quoted by CCANP identify a significant breakdown in any portion of the QA program under Criterion V?

A.61 No. As explained previously, Quadrex apparently was seeking a project-wide document which provided guidance for conducting FMEAs. Such a project-wide document is not required under Criterion V or under Criterion III. In any case, B&R had not yet begun to perform FMEAs for key systems. Consequently, guidance for this effort was not yet required to be in place.

Q.62 Does finding 3.1(e) identify a significant breakdown in any portion of the QA program for STP?

A.62 No. As we have discussed previously, finding 3.1(e) does not identify a significant breakdown in any portion of the quality assurance program for STP.

Q.63 What concerns are expressed in finding 3.1(f)?

A.63 Finding 3.1(f) primarily expresses three concerns by Quadrex. First, Quadrex was concerned that there was no documented evidence for assuring that commitments in the Final Safety Analysis Report (FSAR) were being systematically implemented. Second, Quadrex was concerned that there were inconsistencies between the FSAR and design documents. Finally, Quadrex was concerned that there did not appear to be any method to assure the timely updating of the FSAR.

Q.64 Did B&R have a method designed to assure that FSAR commitments were implemented?

A.64 Yes. We understand that coordination of implementation of the FSAR commitments was the responsibility of the B&R Licensing Group (the activities of which Quadrex did not review), and implementation of the commitments was the responsibility of the individual design disciplines. Additionally, we understand that the B&R Design Assurance Group had responsibility for reviewing the

design to assure that FSAR commitments were met. This is a reasonable method for assuring implementation of FSAR commitments.

B&R had two measures designed to assure that FSAR commitments were implemented. First, in accordance with the review and comment process described earlier, B&R issued design documents such as SDDs that reflected those regulatory and code requirements which the design organizations were to meet. Secondly, B&R committed to a formal design assurance process in accordance with procedure STP-SD-005 which, among other things, was intended to assure that regulatory/licensing commitments were fully implemented as reflected in the FSAR upon design completion.

In addition, B&R procedure STP-DC-015 required design verifiers to confirm that the designs being verified conformed with FSAR requirements and to initiate FSAR change notices for designs which did not conform. This procedure provided an additional method for assuring that the design conformed with the FSAR.

Q.65 What was the basis for Quadrex's concern that B&R did not have a method for assuring that FSAR commitments were systematically implemented?

A.65 Quadrex's concern in finding 3.1(f) is essentially the same as the concern in finding 4.3.2.1.(g), which states that a "systematic method to assure that FSAR commitments are implemented in the design does not appear to exist...." In turn, finding 4.3.2.1(g) cites four questions, none of which provides adequate information to support the conclusion that there was no documented method for assuring that FSAR commitments were being systematically implemented.

Q.66 Please explain whether Quadrex's concern that there were inconsistencies between the design and the FSAR indicates a significant breakdown in any portion of the QA program for STP.

A.66 In many projects, such as STP, the FSAR is not used to control design activities but instead is used to summarize pertinent information in the design documents which do govern the design activities. During construction, the design of a project evolves, as reflected by revisions to the controlled design documents, and the FSAR is often amended to incorporate these revisions. Since there is inevitably some delay between the time that the design is changed and the FSAR is amended to reflect that change, it is not unusual for some inconsistencies between the design and the FSAR to exist. As long as the differences between the FSAR and the design are

identified and controlled, and as long as design activities are being controlled by the appropriate design documents, inconsistencies with the FSAR do not pose a significant quality problem.

In the case of STP, B&R did have a procedure (STP-DC-012) for controlling changes to designs which necessitated amendments to the FSAR. Among other things, this procedure required that any changes in design which differed from the FSAR be documented on a change notice describing the change and identifying affected pages of the FSAR, and it required that a control log be maintained for these change notices. This is an appropriate procedure to control inconsistencies between the FSAR and design documents.

Q.67 Please explain whether Quadrex's concern that there was no method to assure the timely updating of the FSAR indicates a significant breakdown in any portion of the QA program for STP.

A.67 Failure to update the FSAR in a timely manner may result in some temporary inconsistencies between the FSAR and the design documents governing the design activities. As we explained in response to the previous question, such inconsistencies do not pose a significant quality problem as long as the entire process is controlled. However, timely updating of the FSAR is important in order to provide the NRC

Staff with proper information for the conduct of its functions. In this regard, B&R had a procedure (STP-DC-012) for control and processing of changes to the FSAR.

Q.68 Is there any other reason why Quadrex's concerns regarding inconsistencies between the FSAR and various design documents and regarding the need to update the FSAR would not be reportable under 10 CFR § 50.55(e)?

A.68 Yes. We have reviewed the Quadrex Report to identify examples related to Quadrex's concerns. The examples we identified generally involved a design or design practice which was technically adequate but which was either inconsistent with the FSAR or not reflected in the FSAR. In fact, in many cases, the Quadrex Report states that the design or design practice in question was acceptable or consistent with industry practice and NRC guidance. Consequently, Quadrex's concern also would not be reportable because it does not identify a condition which, if left uncorrected, could have adversely affected the safety of operations.

Q.69 CCANP's Motion, pp. 42-43, quotes the following sentences from finding 3.1(f) as a basis for its contention that finding 3.1(f) identifies a violation of Criterion VI:

"There [were] many inconsistencies noted between the FSAR and other design and procurement documents."

"There did not appear to be any method to assure that timely updating of the FSAR was being accomplished."

"In a number of areas, the FSAR is now out-of-date."

CCANP states that these sentences demonstrate a failure "to adequately control the issuance of documents, such as instructions, procedures, and drawings, including changes thereto, which prescribed safety-related design and engineering." Id. Do these sentences identify a violation of Criterion VI of Appendix B to 10 C.F.R. Part 50?

A.69 No. As previously explained, Criterion VI requires that, if a document is issued or revised, it be accomplished in a controlled manner. Criterion VI does not require that any particular document, including the FSAR, be updated, nor does it prohibit inconsistencies between the FSAR and other types of documents as long as those inconsistencies are controlled. Furthermore, as we explained previously, the matters raised in these sentences do not indicate a significant breakdown in any portion of the QA program for STP.

Q.70 CCANP's Motion, p. 43, quotes the following sentence from finding 3.1(f) as a basis for its contention that finding 3.1(f) identifies a violation of Criterion X of Appendix B to 10 CFR Part 50:

> "These were numerous differences between EDS practices and FSAR promises."

CCANP states that this sentence demonstrates a failure "to establish and execute effectively a program for inspection of safety-related design and engineering work." Id. Please explain whether this sentence quoted by CCANP indicates a significant breakdown in inspection of design work under Criterion X.

A.70 As we explain previously, Criterion X is generally understood to apply to inspection of fabrication and construction activities rather than design or engineering work. Thus, the sentences quoted by CCANP would not indicate a significant breakdown in the QA program for STP under Criterion X.

Furthermore, as part of its subcontract responsibilities, EDS was directed by B&R to conform its design activities to the same Technical Reference Documents which were being used by B&R personnel in the performance of their duties with regard to piping stress analysis and pipe support design. These TRD's represent the primary method used by B&R to implement licensing commitments with respect to analytical methods.

Finally, it may be noted that while Quadrex identified differences between some of EDS's design activities and the then-current revision of the FSAR, Quadrex confirmed that these activities were technically adequate. See Quadrex's assessment of EDS's responses to Questions P-7, P-9, and P-24. Thus, the existence of these difference would not have adversely affected the safety of operations.

Q.71 Does finding 3.1(f) identify a significant breakdown in any portion of the QA program for STP?

A.71 No. As we have previously discussed, finding 3.1(f) does not identify a significant breakdown in any portion of the QA program for STP.

Q.72 What concerns are expressed in finding 3.1(g)?

A.72 Finding 3.1(g) primarily expresses Quadrex's concern that there was very little evidence of a well-thought-out and consistent basis for design, that much of the plant design basis was solely rooted in engineering judgment, and that the rationale for this judgment was not documented in a retrievable manner. Quadrex provided several observations in support of its concern. Some of these observations were also the subject of findings we have discussed previously. Others included observations that much of the design was based upon unverified preliminary data; that a

number of key front-end criteria documents had not yet been prepared; that work performed by one contractor was not being reviewed by other contractors; that B&R did not have a consistent requirement for design margins and allowed individual engineers to make this determination; and that B&R did not require the use of either design manuals that provide guidance on acceptable practices or individual engineer log-books.

Q.73 Please discuss whether the concern expressed by Quadrex in finding 3.1(g) identifies a significant breakdown in any portion of the QA program for STP.

A.76 When read in context, it appears to have been Quadrex's concern that each discipline was establishing its own design basis, that much of the design bases were rooted solely in engineering judgment, and that because the rationale for this judgment was not documented, new project personnel were not familiar with the reasons why their predecessors had selected certain design bases. However, as we explained previously with respect to findings 3.1(a), 3.1(b) and 3.1(c), it is acceptable for each discipline to develop its own design basis rather than relying upon a project-wide document or multidisciplinary guidance. Furthermore, use of engineering judgment in development of the design basis is appropriate, and the rationale for that

judgment need not be documented as long as the design basis itself is documented. Although we agree that it would have been beneficial if new project personnel were familiar with the rationale for the design basis established by their predecessors, the absence of such familiarity does not present a problem as long as the design basis is documented. In any case, Bechtel's own review of B&R's design basis indicated that the design basis was primarily rooted in the Safety Analysis Reports, regulatory guides, industry codes, and other standard sources for design bases. Consequently, Quadrex's concern does not indicate a significant breakdown in any portion of the QA program for STP.

The examples provided by Quadrex in finding 3.1(g) also do not identify a significant breakdown in any portion of the QA program for STP. Basing the design upon unverified preliminary data is generally necessary at the start of design and does not identify any quality assurance problems. Quadrex's concern in this area generally pertained to the over-conservatism incorporated in this data. Similarly, while it may have been desirable for B&R to have produced the key front-end criteria documents mentioned by Quadrex, many of these documents were not yet needed at that time given the status of design. More generally, many plants have been successfully completed without using

these types of documents in the design process. Additionally, as we have explained previously, Appendix B does not require that design assumptions (including the design margins) be consistent from discipline to discipline, nor does it require that one contractor review the work of other contractors, provided there is review to assure conformance with the procurement documents and compatibility at interfaces. Finally, there is no requirement that design manuals be prepared to provide uniform guidance to disciplines or designers or that designers use "individual engineer log-books," provided that other acceptable means of identifying the design input and assumptions are used in preparing a design. It may be noted that B&R in fact treated its collection of SDDs and TRDs as a design manual and had a procedure (STP-SD-001) to this effect.

Q.74 CCANP's Motion, pp. 39-40 quotes the following two sentences from finding 3.1(g) as identifying a violation of Criteria I and XVIII of Appendix B to 10 CFR Part 50:

> "Significant quality variations were also observed in the design review comments provided for internal documents prior to their initial issue or their subsequent revision."
>
> The current design includes design details "obtained from other PWR plants and used without confirming their" appropriateness for this application.

CCANP states that these sentences demonstrate a failure "to adequately verify safety-related design and engineering work at the South Texas Nuclear Project." Id. What relevance, if any, do these sentences, or design verification in general, have to Criteria I and XVIII?

A.74 These sentences, and design verification in general, are not relevant to Criteria I and XVIII. Criterion I requires that the responsibilities of organizations performing activities affecting quality be established in writing, and it sets forth certain requirements with respect to those responsibilities. Criterion I does not specify any requirements for reviewing, verifying, or commenting upon design documents or design details. Similarly, Criterion XVIII requires that a comprehensive system of planned and periodic audits be carried out to verify compliance with and the effectiveness of the quality assurance program. Criterion XVIII does not impose any requirements with respect to comments on or verification or review of design. Design verification is encompassed within Criterion III, not Criteria I or XVIII.

Q.75 Does the first sentence quoted by CCANP identify a violation of the verification requirements of Criterion III?

A.75 No. Providing comments on internal documents prior to their issuance is not encompassed within design verification as that term is used in Criterion III. Moreover, finding 3.1(g) only states that "quality variations" were observed in the comments. We assume this means that some comments were not as thoughtful as others and that the finding was not intended to identify a deficiency in the comments or in any quality assurance control measures required by Appendix B.

Q.76 What is the basis for the second sentence quoted by CCANP?

A.76 The statement that design details from other plants were used without confirming their applicability at STP appears to be based upon Quadrex's assessment of B&R response to Questions P-2 and M-28. Quadrex's assessment in P-2 explicitly states that reliance upon information provided by Westinghouse is "probably satisfactory" but that B&R "should be more involved in understanding similar plant operating experiences" to assure that components have adequate duty cycle life. Similarly, in its assessment of B&R's response to Question M-28, Quadrex observed that B&R had directly used Westinghouse plant design events without review for plant availability or economic considerations.

Q.77 Did these Questions indicate a significant breakdown in the verification process for STP?

A.77 No. Quadrex's concern in this area does not appear to be safety-related but instead related to matters of plant availability.

Q.78 CCANP's Motion, p. 40, quotes the following two passages from finding 3.1(g) as identifying a violation of Criteria II and XVII of Appendix B to 10 C.F.R. Part 50:

> "Much of the plant design basis is rooted solely in engineering judgment and the rationale for this judgment, has not been documented in a retrievable manner."
>
> "B&R does not require use of . . . individual engineer log-books to record key bases, assumptions or decisions. . . . Consequently, fundamental background information regarding the STP design is difficult to retrieve since many current B&R engineers are not sufficiently familiar with the STP design or its bases."

CCANP states that these passages demonstrate a failure "to assure adequate documentation in an identifiable and retrievable manner of the safety-related design and engineering work at the South Texas Nuclear Project." Id. Is Criterion II relevant to these passages?

A.78 No. Criterion II requires that licensees establish and implement a written quality assurance program. Criterion II does not identify any specific requirements applicable to the maintenance of records or documents.

Q.79 Do these passages identify a violation of Criterion XVII?

A.79 No. Criterion XVII establishes requirements for the preparation and maintenance of records that "furnish evidence of activities affecting quality." Criterion XVII also identifies various types of records which must be maintained. Engineer log-books and documentation of the rationale for engineering judgment are not explicitly identified as types of records which must be maintained under Criterion XVII. Furthermore, lack of documentation of the rationale for judgment in the selection of the design basis (as distinct from documentation of the design basis itself) is not inconsistent with the provisions of Criterion XVII. Finally, although engineer log-books may be one method by which the requirements of Criterion XVII can be satisfied, there are acceptable alternatives to the use of engineer log-books for recording design bases, assumptions and decisions, such as preparing a separate document for each calculation or design activity. For example, B&R

issued SDDs and TRDs and documented calculations on separate documents. Consequently, the absence of engineer log-books does not identify a violation of Criterion XVII.

Q.80 CCANP's Motion, pp. 41-42, quotes the following sentences from finding 3.1(g) as identifying a violation of Criterion V of Appendix B to 10 C.F.R. Part 50:

> "There was little evidence of a well-thought-out and consistent basis for design."
>
> "A number of key front-end criteria documents are missing [for] STP."
>
> "A plan to identify and develop these TRDs on the project was not evident."

CCANP states that these sentences demonstrate a failure "to adequately prescribe by documented instructions, procedures, or drawings the safety-related design and engineering activities at the South Texas Nuclear Project." Id. Please explain whether these sentences quoted by CCANP identify a significant breakdown in any portion of the QA program for STP.

A.80 As we explained previously, the first sentence quoted by CCANP does not indicate a significant breakdown in any portion of the QA program for STP. Furthermore, with respect to the other sentences quoted by CCANP, we have previously explained that Appendix B does not require the type of project-wide document sought by

Quadrex. Although such documents may be used to provide guidance to designers, there are other acceptable methods of communicating such guidance. Thus, for the reasons previously discussed, these sentences quoted by Quadrex do not indicate a violation of either Criterion V or Criterion III.

Q.81 CCANP's Motion, p. 43, quotes the following sentence from finding 3.1(g) as identifying a violation of Criterion VII:

> "It was noted that the Materials Group does not review subcontractor material selection[s]."

CCANP states that this sentence demonstrates a failure "to adequately establish measures to assure that purchased safety-related engineering and design services conformed to procurement documents." Id. What is the nature of the concern expressed by Quadrex by this sentence?

A.81 This sentence in finding 3.1.(g) appears to be based upon Quadrex's assessment of B&R's response to Question C-39, which states that "Brown & Root Materials Group does not review material selections by [design] contractors prior to vendor release for manufacture." In other words, B&R would hire a subcontractor, such as EDS, to perform design work and to select the material type, and the vendor would be

authorized to commence manufacture of the item using that material type without any provision for prior review by the B&R Materials Group.

Q.82 Does such a practice identify a violation of Criterion VII?

A.82 No. Criterion VII requires that measures "be established to assure that purchased material, equipment, and services, whether purchased directly or through contractors and subcontractors, conform to the procurement documents." A review by B&R of the material selections of its subcontractors was not the only acceptable means to assure that the subcontractors' design work satisfies the procurement documents between B&R and the subcontractors.

It should be noted that the absence of a review of the materials selections of its subcontractors by the B&R Materials Group does not mean that the materials selections were going unreviewed. Criterion III requires that these selections be reviewed and verified. Review and verification by the subcontractors satisfies the requirements of Appendix B and assures that the materials selection is appropriate. Our discussion with respect to finding 3.1(b) provides additional information regarding the controls for assuring conformance with procurement documents.

In fact, the procedures for reviewing pipe support subcontractor documents did not require review by the Materials Group. It is our understanding that material selections (even those made by B&R disciplines) were not, as a normal practice, required to be reviewed by the Materials Group. This group was utilized by B&R as a specialized technical support staff whose primary function was to assist the design disciplines in establishing general material requirements and in resolving specific material problems. The group did not function as a reviewer of all material selections, but rather only of those material questions directed to it.

Q.83 Does finding 3.1(g) identify a significant breakdown in any portion of the QA program for STP?

A.83 No. As we have discussed previously, finding 3.1(g) does not identify a significant breakdown in any portion of the QA program for STP.

Q.84 What concerns are expressed in finding 3.1(h)?

A.84 Finding 3.1(h) primarily expresses Quadrex's concern that reliability requirements had not been established for equipment.

Q.85 Does this concern indicate a quality assurance problem?

A.85 No. There is no explicit requirement in Appendix B to 10 CFR Part 50 that the procurement documents for equipment include specific reliability requirements. Furthermore, it is not general industry practice for procurement documents to include specific reliability requirements for all equipment. B&R's program for obtaining satisfactory performance of most equipment consisted of such measures as specification of a quality level consistent with the intended function of the equipment, reliance on historical data and experience, and qualification tests or analysis. This is consistent with industry practice. Additionally, for certain components, such as the ESF sequencer, requirements for performance of reliability analyses or demonstration tests may also be specified (which is what B&R had done for the ESF sequencer).

Q.86 CCANP's Motion, pp. 15-16, 39, and 40-41, quotes the following sentence as identifying a violation of Criteria I and II:

> "The absence of specific reliability requirements in both mechanical and electrical equipment specifications, and the inability to produce a standard checklist of postulated failures to be considered casts doubt on the rigor of the safety-related evaluation process."

CCANP states that this sentence demonstrates a failure "to establish and effectively execute an acceptable quality assurance program" and a failure "to properly

identify safety-related versus non-safety-related aspects of the design." Id. Does this sentence identify a violation of Criteria I or II?

A.86 No. Criteria I and II are obviously inapplicable since they only set forth quality-related requirements for the establishment of a QA program and for the organizations of the licensee and its contractors. Neither specifies reliability requirements or requirements for the use of standard checklists of postulated failures. Furthermore, as we have explained previously, it is not necessary that reliability requirements be explicitly specified. Although a standard checklist of postulated failures can be useful in the safety-related evaluation process, this process can be successfully completed without such a checklist.

Q.87 Does finding 3.1(h) identify a significant breakdown in any portion of the QA program for STP?

A.87 No. As we have discussed previously, finding 3.1(h) does not identify a significant breakdown in any portion of the QA program for STP.

Q.88 What concerns are expressed in finding 3.1(i)?

A.88 Finding 3.1(i) (which mistakenly is designated as 3.1(j) in the Quadrex Report) primarily expresses two concerns by Quadrex. First, Quadrex was concerned

about the fact that certain nuclear-related analyses had not yet been completed, about the technical adequacy of the nuclear-related analysis methods and assumptions, and about the high error rate in these calculations. Second, Quadrex was concerned that a large amount of nuclear-related analysis was subcontracted and that the technical guidance provided to the subcontractors and the review of the subcontracted analyses by B&R did not appear to be adequate.

Q.89 Does the first concern indicate a significant breakdown in any portion of the quality assurance program for STP?

A.89 No. The thrust of Quadrex's concern regarding analyses which had not yet been completed was to indicate a productivity or scheduling problem and not a significant breakdown in any portion of the QA program.

The concerns raised by Quadrex regarding inadequate analysis methods or high error rates could relate to quality assurance matters. We have reviewed the discipline findings cited by Quadrex as support for its finding that B&R nuclear-related analysis methods were inadequate and contained a high error rate. The discipline findings do not identify a large number of inadequate calculations and, with the

exception of the deficiencies which were reported to the NRC, the findings do not identify any safety-significant deficiencies. Consequently, Quadrex's finding does not support a conclusion that there was a significant breakdown in any portion of the QA program for STP.

Some of the "errors" related to calculations which were not inadequate, but needed to be updated. For example, Quadrex cited as an inadequacy in the methods used by B&R's Nuclear Analysis Group the use of a computer code, RELAP3, which at the time of the Quadrex review was being replaced in general usage by the NRC and the industry with later, more realistic (i.e., less conservative) modelling methods. Quadrex indicated that B&R and its subcontractor, NUS, were using these modern methods, but cited as an inadequacy the use of RELAP3 in older calculations.

In general, Quadrex's concerns regarding Nuclear Analysis calculations appear to be largely based, not on specific errors, but on the impression that Nuclear Analysis personnel were not as knowledgeable of certain design assumptions or factors as Quadrex believed they should have been. In fact, Quadrex assessments of the B&R responses in the Nuclear Analysis area often explicitly pointed out that no errors had been found, although they did indicate a concern about the relative lack of understanding by

some B&R personnel of the factors affecting these analyses. Where specific errors or inconsistencies in calculations were noted by Quadrex, a complete reading of the Quadrex assessment and an understanding of the related circumstances reveals that Quadrex was mostly concerned with the timeliness of certain analyses the changing regulatory acceptance of certain analytical methods or the overconservatisms to be found in some older calculations.

The disciplines mentioned in this finding other than Nuclear Analysis were HVAC, Piping and Supports and Special Stress. The significant deficiencies in the HVAC area were covered by HL&P's 50.55(e) report.

In the pipe support analysis area, Quadrex appears to have been primarily concerned about what they believed were inappropriate methods. For the most part, the "inappropriate methods" consisted of differences between methods used by B&R and its subcontractors, differences between the methods being used and those described in the FSAR, and differences between the methods being used and those currently being recommended by the NRC Staff. In general, the "inappropriate methods" did not involve actual errors in calculations. In the area of pipe rupture analysis, Quadrex expressed similar concerns regarding the analytical methods being used and identified analyses which had not yet been completed, but in

general it did not identify actual errors in calculations. In fact as to the Piping and Supports and Special Stress areas, Quadrex found that the EDS design analysis appeared to be "technically adequate," that a "limited amount of actual STP piping design and analysis work" had been accomplished by B&R, and that "[m]any of the design practices and analytical methods examined were . . . consistent with industry practice." See Quadrex Report (Applicants' Exhibit 60), pp. 4-74 and 4-77. Since the few errors identified by Quadrex were either of limited scope (i.e. HVAC) or did not represent safety significant design errors, this concern does not represent a significant breakdown in any portion of the quality assurance program for STP.

Q.90 Please explain whether the second concern indicates a significant breakdown in any portion of the quality assurance program for STP?

A.90 Initially, it should be noted that Appendix B to 10 CFR Part 50 does not prohibit a licensee from contracting or subcontracting for design work. In fact, Criterion I of Appendix B explicitly authorizes the delegation of the work of establishing and excuting the QA program as long as the licensee retains responsibility. Thus, Quadrex's finding that

B&R had subcontracted a large amount of nuclear-related analysis does not identify a significant breakdown in any portion of the QA program for STP.

We have already addressed Quadrex's concern about the technical guidance provided by B&R to subcontractors and vendors and the review of their analyses by B&R with respect to finding 3.1(b). For the reasons which we previously stated, this concern does not identify a significant breakdown in any portion of the QA program for STP.

Q.91 CCANP's Motion, p. 39, quotes the following sentence from finding 3.1(i) as identifying a violation of Criteria I and II of Appendix B to 10 CFR Part 50:

> An "abnormally high error rate was observed" in Brown & Root calculations for the nuclear, as opposed to the conventional, aspects of the engineering work.

CCANP states that this sentence demonstrates a failure "to establish and effectively execute an acceptable quality assurance program." Id. Does this sentence identify a significant breakdown in any portion of the QA program for STP?

A.91 No. As we have previously discussed, the calculational errors or inconsistencies identified by Quadrex do not represent a significant breakdown in any portion of the QA program for STP.

Q.92 CCANP's Motion, p. 43, quotes the following passage from finding 3.1(i) as identifying a violation of Criterion VII of Appendix B to 10 CFR Part 50:

> "The amount of nuclear-related analysis that is subcontracted by B&R is higher than a typical A/Es practice. The technical guidance provided by some of these Groups for subcontracted consultants, such as EDS and NUS, does not appear to be adequate."

CCANP states that this passage demonstrates a failure "to adequately establish measures to assure that purchased safety-related engineering and design services conformed to the procurement documents." Id. Does this passage quoted by CCANP identify a violation of Criterion VII?

A.92 No. What "technical guidance" must be provided to suppliers is not the subject of Criterion VII, which pertains to the purchaser's measures to verify conformance of supplied material, equipment, and services with procurement documents. The criterion of Appendix B which is most relevant to this passage is Criterion IV, which pertains to procurement document control. As we previously explained with respect to finding 3.1(b), Criterion IV does not require that procurement documents include the type of detailed guidance suggested by Quadrex, especially for experienced contractors such as EDS and NUS.

Q.93 Is finding 3.1(i) reportable under 10 CFR § 50.55(e)(1)(i)?

A.93 No. As we have expressed, finding 3.1(i) would not be reportable under 10 CFR § 50.55(e)(1)(i) because it does not identify a significant breakdown in any portion of the QA program for STP.

Q.94 What is the subject of finding 3.1(j)?

A.94 Finding 3.1(j) primarily expresses four concerns of Quadrex regarding the design verification process. First, Quadrex was concerned that B&R's design verification process permitted the use of preliminary data up to the point of fuel loading. Second, Quadrex was concerned that there were no documented standards regarding the minimum qualifications for a design verifier. Third, Quadrex was concerned that the only evidence of a completed design verification was a signature. Finally, Quadrex was concerned that errors were not detected by design verifiers.

Q.95 Does the fact that B&R permitted use of preliminary data up to the point of fuel loading indicate a quality or safety concern?

A.95 No. Initially, it should be noted that, while B&R did not plan to perform final verification of a design until final input was available and design was nearing completion, B&R's procedure (STP-DC-015) required a

check of preliminary designs prior to release for construction or procurement. This check was intended to confirm that the preliminary designs were acceptable based upon the preliminary input then available.

Design verification is encompassed within the scope of Criterion III of Appendix B to 10 CFR Part 50. Criterion III does not include specific requirements regarding the timing of verification activities. Nevertheless, when possible, it is good practice to verify a design prior to release for construction or procurement.

It is not uncommon to defer final verification of some types of structures, systems, and components until after construction is well-underway or in some cases completed. For example, plant structures are often built in accordance with a preliminary design which is based upon conservative estimates of expected loads. As design and construction of the structure are completed, it becomes possible to determine the actual loads on the structure, and the design of the structure is then verified using these loads. By using a conservative preliminary design subject to later verification, the possibility for design changes to account for final loads is minimized, construction can proceed in a timely manner, and the design is confirmed to be acceptable.

Q.96 Does the absence of documented standards for the qualifications of design verifiers indicate a significant breakdown in any portion of the QA program for STP?

A.96 No. Criterion III only states that design verification "shall be performed by individuals or groups other than those who performed the original design, but who may be from the same organization." As long as the verification is performed by individuals who are competent, appropriately trained, and qualified, Criterion III and Appendix B in general do not require that the specific qualifications of a verifier be spelled out in a document. Quadrex itself acknowledged this fact in finding 3.1(j) and stated that B&R's approach (as embodied in procedure STP-DC-015) of having the Discipline Project Engineer select the design verifier from within the discipline "does not violate NRC requirements." In fact, this approach was consistent with industry practice.

Q.97 Does Quadrex's concern that the only evidence of a completed verification was a signature and that B&R did not require the use of a design verification checklist indicate a significant breakdown in any portion of the QA program for STP?

A.97 No. There are many acceptable methods for satisfying the requirements in Criterion III for suitable design controls governing verifications. One method includes the use of design verification checklists; other acceptable methods include the use of procedures to prescribe how the verification shall be conducted and what elements should be addressed (which was the method discussed in B&R procedure STP-DC-015) or the use of individually-prepared documents which record how the verification was conducted. Consequently, use of design verification checklists is a permissible, but not a required, means of providing an auditable record of design verifications. Furthermore, B&R's procedure for design verification does identify documentation requirements (i.e., comment forms and input list) in addition to the verifier's signature on the design document.

Q.98 What was the basis for Quadrex's concern that errors were not detected by design verifiers?

A.98 Quadrex cites its assessment of B&R's response to Question C-16 as a basis for its conclusion that errors were not detected by design verifiers. Although this assessment does state that a "significant number of mistakes" passed through the verification process, it does not identify the significance or the number of those mistakes or the

number of calculations reviewed by Quadrex. Furthermore, the assessment states that Quadrex was "unable to evaluate the effectiveness" of the B&R design verification procedure, which Quadrex found to be adequate on paper.

Q.99 Does this indicate a significant breakdown in the QA program for STP?

A.99 As we discussed prevously with respect to finding 3.1(b), the information provided by Quadrex in C-16 is not sufficient to support an independent determination that a significant breakdown occurred in the verification process at STP.

Q.100 CCANP's Motion, pp. 39-40, quotes the following passages from finding 3.1(j) as identifying a violation of Criteria I and XVIII of Appendix B to 10 CFR Part 50:

> "There [are] no documented standards regarding the minimum qualifications required for a design verifier."
>
> "The only evidence of a completed design verification is a signature, since B&R does not require either the use or completion of design verification checklists. Consequently, there is evidence that the key design verification questions are not being adequately [considered]."

CCANP states that these passages demonstrate a failure "to adequately verify safety-related design and engineering work at the South Texas Nuclear Project." Id. Do these quoted passages, or design verification in general, have any relevance to Criteria I and XVIII?

A.100 No. Criteria I and XVIII do not specify requirements that directly relate to these passages or design verification in general. Criterion I requires that the responsibilities of organizations performing activities affecting quality be established in writing, and it sets forth certain requirements with respect to those responsibilities. Criterion I does not contain any requirements regarding design verification. Similarly, Criterion XVIII requires that a comprehensive system of planned and periodic audits be carried out to verify compliance with the effectiveness of the quality assurance program. Criterion XVIII does not impose any requirements with respect to verification or review of design. Design verification is encompassed within Criterion III, not Criteria I or XVIII.

Q.101 Please explain whether these passages identify a violation of Criterion III?

A.101 Quadrex does not provide support for its conclusion that key design verification questions were not being adequately considered. We have previously explained that the remainder of these passages do not identify any violation of Criteria II and III.

Q.102 Does finding 3.1(j) identify a significant breakdown in any poriton of the QA program for STP?

A.102 No. As we have previously discussed, finding 3.1(j) does not identify a significant breakdown in any portion of the QA program for STP.

Q.103 What does finding 4.1.2.1(b) state?

A.103 Finding 4.1.2.1(b) states as follows:

> There was no evidence of Civil/Structural evaluation of the reasonableness of postulated internal missiles or that the criteria for internal missiles presented in TRD IN209RQ013-A had been implemented in the design (see Question C-9).

Q.104 Does finding 4.1.2.1(b) identify a significant breakdown in any portion of the QA program for STP?

A.104 No. Tnis finding does not identify a significant breakdown in any portion of the QA program for STP. Evaluation of internal missiles is generally deferred until late in the desigr process after the design is largely complete. Thus, the fact that B&R had not yet evaluated the criteria for internal missiles or implemented the criteria into the design was

consistent with industry practice. Additionally, it should be noted that Quadrex found in its assessment of the B&R response to Question C-9 that Civil/Structural "was handling the missile penetration problem in accordance with industry practice and the state-of-the-art." In short, finding 4.1.2.1(b) does not identify any problem or deficiency in the work being performed by B&R or a significant breakdown in any portion of the QA program for STP.

Q.105 Does finding 4.1.2.1(b) identify a significant breakdown in any portion of the QA program for STP?

A.105 No. As we have discussed above, finding 4.1.2.1(b) does not identify a significant breakdown in any portion of the QA program for STP.

Q.106 What does finding 4.3.2.1(a) state?

A.106 Finding 4.3.2.1(a) states as follows:

> The common instrument air line, as depicted in FSAR drawing 9.4.2-2 attached to Question R-6, does not meet the single failure criterion required by IEEE 279-1971 and 10 CFR 50 (see Question E-15). The occurrence of this design error in the late 1970's in concert with the B&R response to other single failure criterion questions suggests that B&R is not sufficiently experienced in the performance of a Failure Mode and Effects Analysis that crosses discipline boundaries. (5) In most organizations, the I&C discipline would detect and immediately correct this type of design error by performing

a rigorous examination of the separation provided between redundant divisions in the safety-related portions of the plant for all involved disciplines.

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(5) Instrument line blockage was identified as a potential concern for single failure analyses in the 1970 period when an early B&W plant had three instruments connected to two piping taps. Technicians repeatedly replaced the instrument connected to one tap because it read differently than the other two instruments connected in common to the other tap; only later did they discover that a blocked instrument line was causing the two common instruments to read erroneously.

Q.107 Does this finding indicate a significant breakdown in any portion of the QA program for STP?

A.107 No. Although this finding does identify a design feature as a violation of technical requirements applicable to the common instrument air line, there is no indication in the finding itself or in the questions which it cites that the selection of this design feature was related to or caused by a significant breakdown in any portion of the QA program for STP.

It should be noted that, after Bechtel reviewed the Quadrex Report in 1982, the NRC was notified that the subject of this finding was potentially reportable under 10 CFR § 50.55(e) as a deficiency in design. It was later determined that failure of the

air line would not result in a safety hazard and that the design of the common instrument air line had not been released for construction. Accordingly, the NRC was informed that this was not a reportable deficiency.

As a result of the evaluation of this finding, a review was conducted by Bechtel of all safety-related piping and instrumentation diagrams (P&IDs) for application of the single failure criterion to instrument air lines. Based upon the results of this review, Bechtel determined that finding 4.3.2.1(a) did not reflect a generic condition or a significant safety issue.

Q.108 Does this finding identify a significant breakdown in any portion of the QA program for STP.

A.108 No. As we have discussed above, finding 4.3.2.1(a) does not identify a significant breakdown in any portion of the QA program for STP.

Q.109 What does finding 4.3.2.1(d) state?

A.109 Finding 4.3.2.1(d) states as follows:

> No formal methodology or documentation exists to verify adequate separation or the single failure criterion (see Questions E-1, E-8, and E-19).

Q.110 Did B&R have a formal methodology for performing and documenting verification of separation requirements and the single failure criterion?

A.110 Yes. B&R had a procedure for design verification (STP-DC-015) which required that designs be verified for failure analysis and separation and that this verification be documented. This procedure satisfied the requirements of Criterion III for design verification.

Q.111 Did B&R have a formal methodology for demonstrating how design documents incorporated separation requirements and the single failure criterion?

A.111 No. However, it may be noted that many projects have been successfully completed without this type of methodology (although Bechtel does have such a formal methodology for STP). Instead, it is common practice for each designer or design group to determine how to document incorporation of the separation requirements and the single failure criterion in its design documents. This practice is acceptable. Furthermore, a uniform methodology or approach for demonstrating satisfaction of separation requirements or the single failure criterion is not required even though it may be desirable.

Q.112 Does finding 4.3.2.1(d) identify a significant breakdown in any portion of the QA program for STP?

A.112 No. As we have discussed above, finding 4.3.2.1(d) does not identify a significant breakdown in any portion of the QA program for STP.

Q.113 What does finding 4.3.2.1(n) state?

A.113 Finding 4.3.2.1(n) states as follows:

> It is planned that various types of isolation devices will be used. Actual devices are still under evaluation and qualification. There is no existing document that provides guidance to the designers on the circuit application of these various types (e.g., optical couplers vs. fuses vs. relays, etc.). It is our opinion that lack of such a document (TRD) could result in design errors and licensing problems (see Question E-14).

Q.114 Does finding 4.3.2.1(n) identify a significant breakdown in any portion of the QA program for STP?

A.114 No. As this finding explicitly states, the use of isolation devices was still under evaluation when Quadrex conducted its review, and isolation devices had not yet been designed, purchased, or installed. Consequently, the type of document identified by Quadrex was not needed at that time. Such a document could be useful when selection of the isolation devices was actually being made.

Q.115 What does finding 4.5.2.1(b) state?

A.115 Finding 4.5.2.1(b) states as follows:

> EDS did not perform a design review or design verification of preliminary loads transmitted to B&R; these loads have, however, been used as a basis for plant design (see Questions C-4 and M-8).

Q.116 Does finding 4.5.2.1(b) identify a significant breakdown in any portion of the QA program for STP?

A.116 No. As we explained previously with respect to finding 3.1(j), use of preliminary loads is acceptable and not uncommon. Furthermore, it may be noted that, in the questions cited in finding 4.5.2.1(b), Quadrex itself stated that the preliminary loads transmitted by EDS were conservative. In fact, a "major concern" of Quadrex was the "potential overconservatism in the design" of EDS. See Quadrex Report (Applicants' Exhibit 60), p. 4-38.

Q.117 What does finding 4.6.2.1(n) state?

A.117 Finding 4.6.2.1(n) states as follows:

> Assumptions regarding the availability of various heat sinks under varying plant conditions should be re-examined (see Question N-17).

Question N-17 provides further details, stating that B&R should have analyzed the temperature of the water in the Essential Cooling Pond (ECP) under conditions of normal shutdown of two units as well as the

condition which Quadrex believes was the only one analyzed by B&R (normal shutdown of one unit and a loss of coolant accident (LOCA) in the other unit).

Q.118 Does finding 4.6.2.1(n) identify a significant breakdown in any portion of the QA program for STP?

A.118 No. Finding 4.6.2.1(n) does not identify a significant breakdown in any portion of the QA program for STP. In fact, an analysis of the ECP had been conducted under conditions of normal shutdown of two units. This analysis was reflected in FSAR Section 9.2.5. Consequently, finding 4.6.2.1(n) does not identify a deficiency.

Q.119 What does finding 4.7.3.1(a) state?

A.119 Finding 4.7.3.1(a) states as follows:

> B&R has not yet developed a criteria for jet impingement protection on unbroken piping systems (see Question P-20). A future TRD is planned.

Q.120 Does finding 4.7.3.1(a) identify a significant breakdown in any portion of the QA program for STP?

A.120 No. B&R had not yet begun design analysis of jet impingement on unbroken piping systems. Since this analysis had not begun, there was no need for B&R to have in place criteria to govern this analysis.

Q.121 What does finding 4.7.3.1(b) state?

A.121 Finding 4.7.3.1(b) states as follows:

> Approximately 50% of the reviewed SDDs do not yet contain system operating temperatures (see Question P-1).

Question P-1 provides further details in support of this finding. Question P-1 states that, of the sixteen SDDs which were reviewed by Quadrex, eight identified system design temperatures, seven did not identify a design temperature directly but did provide a cross-reference for enabling the designer to determine the temperature, and one did not identify either a system design temperature or a cross-reference for obtaining the temperature. These temperatures were used in performing preliminary stress analyses.

Q.122 Does finding 4.7.3.1(b) indicate a significant breakdown in any portion of the QA program for STP?

A.122 No. As Question P-1 states, all but one of the sixteen SDDs reviewed by Quadrex either identified a design temperature or identified a cross-reference for obtaining the temperature. Either approach is an acceptable means of providing guidance to designers for the performance of preliminary stress analyses. Consequently, finding 4.7.3.1(b) and Question P-1 do not identify any pattern of deficient SDDs, but instead identify only an isolated case where an SDD

did not yet provide guidance regarding design temperatures. Furthermore, this SDD was still in draft form and had not yet been issued for control of design activities.

Q.123 What does finding 4.7.3.1(k) state?

A.123 Finding 4.7.3.1(k) states as follows:

> B&R assumptions for seismic to nonseismic boundary anchors are probably unconservative and difficult to technically justify as adequate (see Question P-29).

Q.124 Does finding 4.7.3.1(k) identify a significant breakdown in any portion of the QA program for STP?

A.124 No. Bechtel agrees that the boundary anchor design should be analyzed with a different approach than that taken by B&R. However, it is common when one engineer reviews the work of another, that differences in approach will occasionally arise. Such differences, while generally requiring resolution particularly with respect to degrees of conservatism of the analytical methods, do not indicate the existence of a significant breakdown in any portion of the QA program.

Q.125 What does finding 4.8.2.1(a) state?

A.125 Finding 4.8.2.1(a) states as follows:

> The instrument air piping, between the valves actuated by redundant radiation monitors and the valves that divert air flow through safety-related filter

> trains in the FHB HVAC exhaust subsystem, does not meet the single failure criterion (see Question R-6).

Q.126 Does this finding indicate a significant breakdown in any portion of the QA program for STP?

A.126 No. Finding 4.8.2.1(a) is the same as finding 4.3.2.1(a). As we have previously discussed with respect to finding 4.3.2.1(a), finding 4.8.2.1(a) does not identify a significant breakdown in any portion of the QA program for STP and therefore would not be reportable under 10 CFR § 50.55(e)(1)(i).

Q.127 What does finding 4.8.2.1(b) state?

A.127 Finding 4.8.2.1(b) states as follows:

> No procedures exist that define the minimum qualification requirements for ALARA reviewers. Some design drawings have been reviewed and signed off for ALARA. There is limited evidence that proper follow-up has occurred to verify incorporation of ALARA specified designs (see Question R-1).

Q.128 Does the absence of a document defining minimum qualifications for ALARA reviewers indicate a significant breakdown in any portion of the QA program for STP?

A.128 No. Appendix B to 10 CFR Part 50 only applies to activities affecting the safety-related functions of structures, systems and components. A safety-related activity is an activity which assures the integrity of the reactor coolant pressure boundary, the

capability to shut down the reactor and maintain it in a safe shutdown condition, or the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those specified in 10 CFR Part 100. ALARA activities are obviously not activities which affect these safety-related functions. Consequently, ALARA activities are not encompassed within Appendix B, and therefore failure to apply the QA program under Appendix B to ALARA would not be reportable under 10 C.F.R. § 50.55(e)(1)(i). However, for the purpose of this testimony, the findings were analyzed the same as if Appendix B was applicable to ALARA.

Appendix B to 10 CFR Part 50 does not require documentation of specific requirements for reviewers. However, it should be noted that B&R did have a procedure (STP-DC-016) which required the Engineering Project Manager to designate a qualified individual to perform ALARA reviews. This provision would be sufficient under Appendix B.

Q.129 Does the fact that design drawings were reviewed and signed off for ALARA with limited evidence of follow-up to verify incorporation of ALARA specified designs indicate a significant breakdown in any portion of the QA program for STP?

A.129 No. Apparently, Quadrex was concerned that, with the exception of a drawing sign-off, there was an absence of documented evidence that the comments of the ALARA reviewers were in fact incorporated into the applicable design drawings. Although such documentation is one means of satisfying the requirements of Criterion III for assuring that regulatory requirements and design bases are correctly translated into specifications, drawings, instructions, and procedures, there are other means of satisfying this requirement. For example, B&R identified requirements of the ALARA review in a procedure (STP-DC-016) which required the ALARA reviewer to provide comments to the cognizant engineer and then sign-off on the relevant drawings verifying compliance with the procedure. This is a reasonable measure for documenting acceptable incorporation of the ALARA reviewer's comments.

Q.130 Does finding 4.8.2.1(b) identify a significant breakdown in any portion of the QA program for STP?

A.130 No. As we have discussed above, finding 4.8.2.1(b) does not identify a significant breakdown in any portion of the QA program for STP.

Q.131 What does finding 4.8.2.1(c) state?

A.131 Finding 4.8.2.1(c) states as follows:

> Modification of the MAB HVAC system to eliminate filter media need to be re-examined (see Questions R-5 and R-29).

Q.132 Does finding 4.8.2.1(c) identify any deficiency?

A.132 No. With the exception of the Radiochemistry Lab and the Sample Room, exhaust filter media were not provided in the HVAC design for the Mechanical Auxiliary Building (MAB). Finding 4.8.2.1(c) simply expresses Quadrex's recommendation that this design be re-examined. However, the design complied with the requirements of Appendix I to 10 CFR Part 50. Consequently, there was no deficiency in the design, and finding 4.8.2.1(c) does not indicate anything to the contrary.

Q.133 Does finding 4.8.2.1(c) identify a significant breakdown in any portion of the QA program for STP?

A.133 No. As we have discussed above, finding 4.8.2.1(c) does not identify a significant breakdown in any portion of the QA program for STP.

Q.134 What does finding 4.8.2.1(d) states?

A.134 Finding 4.8.2.1(d) states as follow:

> B&R's position that shielding calculations are not-safety-related needs to be re-examined (see Question R-7). Several shielding analyses were performed by NUS; however, there is no indication that B&R has verified this

> work. Standard models and codes have been used in analyses performed by B&R, yet B&R exhibited a lack of familiarity with and understanding of the codes. A re-review of plant shielding is necessary to ensure that analysis results are properly reflected in design (see Questions R-11, R-12, and R-14).

Q.135 Was the NRC notified that finding 4.8.2.1(d) was potentially reportable?

A.135 Yes. On May 8, 1981, the NRC was notified that the substance of finding 4.8.2.1(d) was potentially reportable. Subsequently, this finding was determined not to be reportable for the reasons discussed with respect to finding 3.1(d).

Q.136 What does finding 4.8.2.1(e) state?

A.136 Finding 4.8.2.1(e) states as follows:

> B&R has not correlated radiation zones to the shielding design and shielding design has not adequately considered ISI requirements or the potential locations for temporary shielding (see Question R-10).

Q.137 Does finding 4.8.2.1(e) identify a significant breakdown in any portion of the QA program for STP?

A.137 No. It should be noted that the shielding design was subject to ongoing reviews by B&R and that in-service inspection (ISI) requirements were still being developed at the time Quadrex conducted its review. Thus, this finding simply identifies an activity

which had not yet been performed by B&R and not a significant breakdown in any portion of the QA program for STP.

Q.138 What does finding 4.8.2.1(f) state?

A.138 Finding 4.8.2.1(f) states as follows:

> Radiation zone drawings based on accident conditions have not been prepared (see Question R-30).

Q.139 Does finding 4.8.2.1(f) identify a significant breakdown in any portion of the QA program for STP?

A.139 No. The need for radiation zone drawings based on accident conditions is an outgrowth of the NRC's position in Item II.B.2 of NUREG-0737, "Clarification of TMI Action Plan Requirements" (November 1980). B&R had not yet prepared these drawings at the time Quadrex conducted its review. Thus, finding 4.8.2.1(f) does not identify a significant breakdown in any portion of the QA program for STP but only a matter which needed to be completed.

Q.140 What does finding 4.8.2.1(g) state?

A.140 Finding 4.8.2.1(g) states as fcllows:

> A design basis governing removable concrete block walls was not evident (see Question R-11).

Q.141 Does finding 4.8.2.1(g) identify a significant breakdown in any portion of the QA program for STP?

A.141 No. At the time Quadrex conducted its review, the design basis for removable concrete block walls was still being developed by B&R. Thus, finding 4.8.2.1(g) does not identify a significant breakdown in any portion of the QA program for STP but only a matter which needed to be completed.

Q.142 Please explain whether the Quadrex Report as a whole would be reportable under 10 CFR § 50.55(e)?

A.142 The Report itself is not an analysis of the adequacy of the design QA program for STP nor does it conclude that there is a widespread breakdown in the design QA program. Although the Report is critical of B&R's engineering practices and includes suggestions for their improvement, Quadrex identified relatively few significant deficiencies in the design product or significant failures of the design process to meet NRC requirements. Our review of the findings has not identified a significant breakdown in any portion of the QA program for STP, except to the extent previously reported to the NRC. Having reviewed the report as a whole, as well as its individual findings, we do not regard the Report itself as "reportable" under 10 CFR § 50.55(e).

STATEMENT OF PROFESSIONAL QUALIFICATIONS
OF SIDNEY A. BERNSEN

POSITION

Corporate Manager of Quality Assurance, Bechtel Power Corporation/Bechtel Construction, Incorporated Manager, Division Quality Assurance Eastern Power Division, Bechtel Power Corporation

EDUCATION

BSME, Purdue University MSME, Purdue University PhD, Purdue University

SUMMARY

7 Years	Quality assurance management 3 Years Project management
11 Years	Engineering management
4 Years	Chief engineer, nuclear and other disciplines
5 Years	Engineering supervision
3 Years	Nuclear and mechanical engineering

EXPERIENCE

Dr. Bernsen has been employed by Bechtel for 23 years. He is currently the corporate manager of quality assurance, Bechtel Power Corporation and Bechtel Construction, Incorporated. He also holds the position of manager of division quality assurance for the Eastern Power Division. He is responsible for overall Bechtel Power Corporation quality program policy and management of Eastern Power Division quality assurance. Activities under his cognizance include quality assurance functions associated with design, construction and operation support services.

Dr. Bernsen previously served as assistant project manager for quality activities on the Midland Project and manager of quality on the Zimmer Project. The Zimmer Project assignment included responsibility for all Bechtel quality assurance, quality control, quality engineering and supplier quality functions associated with the verification and construction completion programs. Earlier, Dr. Bernsen served as assistant project manager-technical, for the South Texas Project. In this capacity, he had management oversight over the

licensing, systems design, project procedures and coordination with the project quality assurance group.

As a member of the Bechtel power management group, Dr. Bernsen held a number of assignments including manager of nuclear engineering, chief nuclear engineer and manager of quality assurance. Earlier, Dr. Bernsen served as an engineering manager and manager of quality assurance in the San Francisco Power Division of Bechtel Power Corporation and held a number of project management, engineering management and chief engineering assignments in the Scientific Development Department. In addition, he has had experience in quality assurance, nuclear power plant design and construction, plant siting and engineering on a variety of power, aerospace and other advanced technology projects.

Prior to joining Bechtel Power Corporation Dr. Bernsen participated in and managed analysis, design and experimentation associated with boiling, pressurized and gas cooled reactors while at the Advanced Technology Laboratory of American Standard, General Atomic and Argonne National Laboratory.

Dr. Bernsen has actively participated in codes and standards activities serving as the initial chairman of: American National Standards Institute (ANSI) N45 Working Group 7, in preparing the initial version of ANSI N45.2 pertaining to quality assurance requirements for nuclear facilities; N45 Subcommittee 2, the committee responsible for N45.2 and the daughter QA standards; and the ASME Nuclear Quality Assurance Committee. He served as the vice chairman of ANSI Committee N45 on reactor plants and their maintenance and is currently chairman of the Nuclear Technical Advisory Group reporting to the American National Standards Institute Nuclear Standards Board. He participated on the International Standard Organization's Committee TC-85, Subcommittee 3, Working Group 8, in preparation of IS06215, "Nuclear Power Plants - Quality Assurnce" and the special task group formed under ANS 3 for the preparation of the revision of the N18.7 Standard to incorporate quality assurance provisions for operation. He was the U.S. technical expert in the drafting of the International Atomic Energy Agency (IAEA) Safety Guide on QA for operation.

Dr. Bernsen has participated in a number of industry activities. He served as a member of the Atomic Industrial Forum (AIF) Committee on Reactor Licensing and Safety, organized and served as the initial chairman of the Subcommittee on Cost Impact, and as chairman of the Subcommittee on Load Combinations. He is the Bechtel Power Corporation member of the IDCOR Policy Committee and served as a member of the IDCOR Steering Committee.

PROFESSIONAL MEMBERSHIPS

American Society of Mechanical Engineers
American Nuclear Society - Past member of the Board of Directors
American Society for Quality Control

REGISTRATION

Registered Nuclear Engineer, California

PUBLICATIONS AND PRESENTATIONS

Dr. Bernsen has published or presented a number of pertinent papers on a variety of subjects. The following lists some of these in the area of quality assurance:

"Nuclear Codes, Standards, and Quality Assurance in the United States," paper published in British Nuclear International, August 1971

"Nuclear Power Plant Quality Assurance Standards - the Status and Application of ANSI N45.2 Standards," a special report published by Nuclear Standards News, January 1973

"Quality Assurance in the Construction of Nuclear Power Plants," paper published in Nuclear Safety, March-April 1975

"Quality Assurance Education Requirements in the Engineer/Constructor Organization," presented at 21st Annual Meeting, American Nuclear Society, New Orleans, L.A., June 8-13, 1975

"Nuclear QA Standards: A Coordinated Effort," article published in Nuclear News, March 1976

"Quality Assurance Experience and Viewpoint From the U.S. Industry," presentation to Norwegian Petroleum Society, Oslo, Norway, April 1978

"The Consolidated U.S. Nuclear Quality Assurance Standard - Present Status and Application," prepared for presentation at Europeon Nuclear Conference, April 1979

STATEMENT OF PROFESSIONAL QUALIFICATIONS
OF FRANK LOPEZ, JR.

Education

B.A., Mathematics and B.S., Physics, Texas A & M University
M.S., Nuclear Engineering, Texas A & M University Graduate Studies: Industrial Engineering Management, University of Houston
M.B.A., Program and Management and Financial Management, West Coast University

Employer

Mr. Lopez has been employed by Bechtel Power Corporation or Bechtel Energy Corporation since graduation from college.

Summary

Present: Project Engineer, Material & Configuration Management

3 Years: Project Engineer, Systems/Licensing

5 Years: Engineering Supervisor in analysis, design, licensing, and evaluation of nuclear power stations, international and domestic

3 Years: Engineer, Nuclear Analysis

Employment Experience

In his current assignment on the South Texas Project, Mr. Lopez is responsible for project coordination of the Configuration Management Program including interface between the Engineering Department and other entities with respect to design freeze activities leading to systems and area completion, configuration control of design document releases, and startup interfaces. In addition, he is responsible for the Engineering Department scope of services for material management including material delivery requirements in support of system and area completion activities in the field. As an additional duty, he supervises design office Engineering personnel responsible for ASME Code activities.

Mr. Lopez previously served as the Assistant Project Engineer, Systems/Licensing on the South Texas Project. His duties have involved direct managment of design, licensing and quality activities for the project, including the transition of responsibilities from the previous architect/engineer. He has directly supervised the Mechanical, Nuclear, Architectural, Quality Engineering and Codes and Standards disciplines on the project, and been directly responsible for the development of the FSAR and project Design Criteria Manual.

Mr. Lopez was previously assigned as the Nuclear Engineering Group Supervisor on the Korea Nuclear Units 5 and 6 project being designed by Bechtel Power Corporation for the Korea Electric Company. His duties included the planning and administration of all nuclear-related design and procurement support activities within the Bechtel Power Corporation scope of services for the project, as well as the coordination of all project licensing activities. In this position, he supervised assigned Bechtel Power Corporation nuclear engineering personnel as well as assigned Korean trainees participating in a technology transfer program.

Mr. Lopez was previously assigned as the Deputy Nuclear Group Supervisor on the Palo Verde Nuclear Generating Station project. This project consisted of three nuclear units under construction by Bechtel Power Corporation for the Arizona Nuclear Power Project, a group of participating utilities. In this assignment, Mr. Lopez had the primary responsibility for the development of the Final Safety Analysis Report, which was submitted to the NRC.

Mr. Lopez was previously assigned as the Nuclear Analysis Group Supervisor for the Los Angeles Power Division. His responsibilities included supervision of a technical staff of engineers and specialists in nuclear and environmental assessment. Further, he was responsible to the Chief Nuclear/Environmental Engineer for the technical adequacy of nuclear analysis tasks performed on all nuclear projects in the LAPD scope, representing twelve domestic and foreign projects.

Mr. Lopez was previously assigned as an Engineer responsible for shielding and dose assessment analysis on both foreign and domestic nuclear power projects. These included the Maanshan Nuclear Power Station project for the Taiwan Power Company and the Blue Hills Station for Gulf States Utilities. He also had responsibilities with respect to the preparation of pertinent portions of the Preliminary Safety Analysis Reports (PSAR), and for numerous environmental analysis performed for inclusion in Environmental Reports (ER).

Professional Affiliations

Registered Professional Engineer, Texas
Member, American Nuclear Society

MR. FRANTZ: I'd now like to have marked for the record Applicants' Exhibit 63 which is entitled An Assessment of the Findings in the Quadrex Corporation Report, dated May 1981, prepared for Houston Lighting & Power Company by Bechtel Power Corporation in March 1982. It's a rather extensive volume.

(Applicants' Exhibit No. 63 marked for identification.)

DIRECT EXAMINATION (Cont'd)

BY MR. FRANTZ:

Q Dr. Bernsen, is Applicants' Exhibit 63 the same document which you identified as Applicants' Exhibit 63 in your prefiled testimony at pages 6 and 7?

A (By Dr. Bernsen) Yes, it is.

MR. FRANTZ: The Applicants move the admission into evidence of Applicants' Exhibit 63.

MR. SINKIN: Objection. And we have a bit of voir dire on this item, too.

MR. FRANTZ: Judge Bechhoefer, I'm not sure you can have voir dire on an exhibit.

MR. SINKIN: Well, as to the -- well, let me think about that.

MR. PIRFO: Well, I think he can, for all it's worth, if we're voting on it.

MR. SINKIN: I think you can. If you're moving to strike the exhibit, there are some basic questions you can ask.

MR. FRANTZ: Okay.

VOIR DIRE EXAMINATION

BY MR. SINKIN:

Q Excuse me, Mr. Bernsen, are you the sponsor on this exhibit?

A (By Dr. Bernsen) Yes.

Q You're the sponsor.

What effort was made during the Bechtel task force report review to ensure that the only information reviewed by the task force was the same information reviewed by Quadrex?

A Mr. Sinkin, I believe the report stands as indicated in the report. The task force did not intend or make an effort to limit their review to the information that was available at that time. And their primary purpose was not to assess the, let's say, the quality of the May review, but rather to look at the issues stated in the report for those that they obtained in their interactions with Brown & Root and Quadrex and provide guidance to the project with regard to how to deal with these findings.

Q What effort was made in the task force review to determine what Mr. Goldberg, Dr. Sumpter or Mr. Robertson knew related to the Quadrex report on May the 8th, 1981?

A I do not believe that was an objective of the task force report. I might add, clearly based upon the level of engineering that had been completed at that time and the small amount that was done subsequently, one could presume that most of the information relied on predated the May period.

Q Do you have personal knowledge of the amount of engineering that Brown & Root completed between May of 1981 and March of 1982?

A No, I do not.

MR. SINKIN: Mr. Chairman, we're going to ask that the admission of this document be limited in its purposes. A review of my questioning of Mr. Stanley, particularly on CCANP 104 I believe it is, will reveal that I pursued three lines of questioning.

First, where there were disputes or differences between Bechtel and Mr. Stanley, I clarified his criticisms so the record would be available for judging whether his criticisms were valid. This record is useful on the issue of the current competence of Bechtel in the 50.55(e) area and the document is useful

in that sense.

Second, I used his comments as a vehicle for illuminating the specific Quadrex findings in his comments. That record is useful for determining whether the findings should have been notified to the NRC.

Third, I linked, wherever possible, the discipline findings to the generic findings, and that record is useful for determining whether the generic findings should have been notified to the NRC.

Both of the latter inquiries could have been conducted without using the Bechtel task force report, but I believe Mr. Stanley's recorded observations to be a useful starting point for sampling the many different findings that exist in the Quadrex report.

CCANP's examination based on CCANP 104 was not based on the Bechtel task force report being a legitimate, admissible or relevant document on the issue of whether specific discipline or generic findings should have been notified to the NRC. The only inquiry specifically tied to the report was examining Bechtel's 50.55(e) decision making process.

CCANP did not ask Mr. Stanley to respond to every task force assessment, only those he specifically commented on. And again, CCANP believed those items provided a good sample of how Bechtel makes 50.55(e)

determinations.

CCANP opposes the admission of this report as relevant to any issue other than Bechtel's competence.

Furthermore, from various comments by Mr. Stanley, it is apparent that the Bechtel task force report is based on different information provided to the task force by Brown & Root than was provided to the Quadrex review team. The task force made no specific effort to limit the information it reviewed to the information provided Quadrex, to the information available in March and April of 1981, or the information available to the HL&P review team that made the 50.55(e) notification decisions. The Bechtel task force report is, therefore, based on different information than was presented to Quadrex, available at the time of the Quadrex study, or known to the HL&P review team.

Under the relevance doctrine proposed for this document coming in, it is not hard to imagine Brown & Root still on the job today, although for some people I'm sure that is hard to imagine, Bechtel doing a review before this hearing and a Bechtel report telling us that Brown & Root has told them the crack/break analysis has been performed because four years later it was performed.

CCANP's response to this document in terms of

whether the findings should have been notified to the NRC is basically "so what?" The document is not relevant.

The inquiry is whether on May 8th, 1981, based on their knowledge, should the HL&P review team have notified the NRC of the entire report or more than three of the three hundred findings. The Bechtel task force report proves nothing regarding that question one way or the other.

In addition, we direct the Board's attention to Mr. Stanley's comment 20 in CCANP 104 in which he says the task force report provides very little information regarding Bechtel's evaluation of the Quadrex generic findings at the time Quadrex did the study. He says, and I quote, "The majority of the Bechtel evaluations state how Bechtel will address these generic findings in the future," how Bechtel will address the generic findings. A review of the task force report confirmed Mr. Stanley's observation. The generic findings in terms of what Quadrex found are not addressed. They're responded to with how Bechtel will perform in the future.

So, the only possible relevance of the report is to the notification issue on specific discipline findings at issue in this proceeding. Mr. Goldberg and

Dr. Sumpter were presented by the Applicants on that issue. The task force report is merely cumulative evidence of far less probative value than the testimony of those who made the decision.

Loading the record with marginal cumulative evidence, particularly since it will require CCANP to conduct extensive cross-examination on the document, will only burden the record with unnecessary material and lengthen the hearing inordinately.

Again, we don't object to the admission of the document for the limited purpose of being relevant to the issue regarding the competence of Bechtel in the area of 50.55(e). We do object to the document coming in on the issue of whether the specific findings should have been notified to the NRC.

MR. FRANTZ: Mr. Sinkin again is raising some of the same arguments he's raised previously and the Board's rejected.

I'd like first to directly address Mr. Sinkin's statements and then go into more general arguments on why this document should come into evidence.

First of all, Mr. Sinkin claims that this document should be in evidence only for the purpose of testing Bechtel's current competence. I fail to see how

that is at all relevant. The Bechtel task force report was prepared by a special task force, not the project team that's now at the site; therefore, it has no relevance to the current competence of HL&P and its contractors to report 50.55(e) matters.

Mr. Sinkin also said that the report should not come in because it addresses more information or parts of the design than were directly reviewed by Quadrex. Again, I fail to see why that is a grounds for objection to the document. If further information not possessed by Quadrex demonstrates that the finding was not reportable, that's clearly probative of whether or not the finding was reportable.

Similarly, the mere fact that the information may have been available on May 8th -- or, I'm sorry, the mere fact that the information may not have been directly presented to the HL&P review team on May 8th is also not relevant to the issues here. The HL&P review team had the benefit of the experience and knowledge of the Brown & Root people, had the benefit of its own experience and knowledge of the project. That experience and knowledge encompasses I think in large part some of the same types of information that were reviewed by the Bechtel task force report. But to claim that there has to be an exact equivalence, again, I

think that is not necessary under any standards of evidence.

Again, we have experts -- this document essentially represents expert opinion as to whether or not the findings were reportable. And as long as the information at the very least is based upon information available as of May 8th, I can't see any grounds for keeping it out.

I'd like to go on to some more general arguments as to why this report should come in.

Back in 1982, the Licensing Board deferred hearings on the Quadrex report in order to consider both the Bechtel reviews and the staff analysis.

JUDGE BECHHOEFER: Mr. Sinkin strongly objected to that, by the way.

MR. FRANTZ: Well, I'm just pointing it out for the record that that's what happened. And I can cite the fourth prehearing conference order at pages 4 and 5.

It would seem to be anomalous now that we have waited several years to get this report to conduct discovery on it and now claim that it should not come into evidence. It just is completely inconsistent with the Board's prior rulings.

In terms of the report itself, the report

clearly states that it's based upon the Quadrex report, information provided by Quadrex. As Mr. Stanley testified, that was information that he had developed prior to May 8th, information provided by Brown & Root as to why the findings were not reportable. These analyses are based upon information that were available at the time HL&P conducted its reportability review on May 8th. Therefore, there's absolutely no basis for keeping the report out on the ground that the report somehow might be based upon after the fact developed information.

Additionally, the report is clearly relevant and material to the issues in the proceeding. The report reviews all of the findings in the report. It makes reportability determinations on all of the discipline findings. It concludes that none of the findings are potentially reportable with the exception of those actually reported and with one additional matter. Thus, the report confirms HL&P's overall conclusions regarding the report, especially HL&P's determination that the Quadrex report need not be submitted as a whole under 50.55(e). Again, this information is clearly relevant and material to the issues the Board has to address here.

Additionally, the Bechtel task force report

directly addresses each of the findings at issue in this proceeding as called out in the various Board orders. The Bechtel task force report provides the opinions of experts who have extensive experience and knowledge. That information provided by these experts would clearly be helpful to the Board in deciding whether or not these findings are reportable.

I'd like to make one further point because Mr. Sinkin keeps coming back to this. The Applicants' case is really a two-part case on the Quadrex report. First of all, we've presented the testimony of Mr. Goldberg and Dr. Sumpter on what HL&P did back on May 8th and why on May 8th HL&P determined that the various findings were either reportable or not potentially reportable.

The second part of the Applicants' case on this issue is to present the testimony of Dr. Bernsen, Mr. Lopez to present Applicants' Exhibit 63 to provide confirmation of the results reached by HL&P back on May 8th. The type of analysis provided in Dr. Bernsen and Mr. Lopez' testimony and in these exhibits is often the type of information provided to the NRC Licensing Boards in these types of hearings. It's simply expert opinion to corroborate decisions made at a previous time by the Applicant.

It would be totally unfair and unreasonable to

the Applicants to exclude this type of overwhelming evidence that the findings in the report were not reportable. And the Applicants, therefore, suggest that Mr. Sinkin's motion should be denied.

JUDGE BECHHOEFER: Does the Staff have a position?

MR. PIRFO: We have no objection to admission of the report. I point out to the Board, though, the Staff did not rely on the report in any way in its testimony. To that extent we do not support Mr. Sinkin's motion, nor do we have any objection to the admission of the document.

MR. SINKIN: If I might respond to some of what was said, Mr. Chairman.

If I heard counsel correctly, he said that the task force report was based on information available at the time of the review on May 8th, not after the fact. But when I asked that very question of Mr. Bernsen, he said the report stands as indicated.

We did not make an attempt to limit the review of the information available at that time. That was the basis for my statement that it was not limited to the information available at that time.

Now, if Mr. Bernsen and counsel have a disagreement over that, maybe we can find that out. But

the testimony in the proceeding is that it was not limited to the information available at that time and, therefore, some of the information is after the fact and would clearly not have been available to the HL&P review team.

MR. FRANTZ: I think Mr. Sinkin is mischaracterizing what both I have said and the witnesses have said. The witnesses said there was no effort made to exclude information. That does not mean that the information, in fact, was reflected or developed after May 8th.

The report itself states, I'm not sure we even need to have any statements by myself or by the witnesses, as to what it's based upon. It's based upon the Quadrex report itself, upon what was told to the task force by Mr. Stanley, and upon what was told to the task force by Brown & Root and HL&P, I guess, also. I am not aware of anything that would indicate that the information provided by any of those parties was information that was solely developed after May 8th.

MR. SINKIN: I wasn't saying solely.

MR. PIRFO: If I may be heard. I should note for the record I misspoke in the sense of saying just our testimony. Of course, NUREG 0948, which is a staff exhibit, does refer to the Bechtel assessment. But now

the Staff has simply viewed those as questions of weight or however Mr. Sinkin or intervenor chooses to characterize after the fact assessments as he's put it.

I just wanted to make the record clear on that. We said that we do not rely on it in our direct testimony, but the Staff exhibit does refer -- at least one of the Staff exhibits does refer to it.

MR. SINKIN: Mr. Stanley did --

JUDGE BECHHOEFER: Mr. Pirfo, does it refer -- I don't recall, I thought it only referred to EN-619, but I'm not sure about that.

According to the executive summary, it refers to EN-619, but there is a general reference to transition program documents, but I'm not sure that --

MR. PIRFO: Well, this other reference -- well, I don't want to get into a discussion now of NUREG 0948, with all due respect. I mean, we can cross that bridge --

JUDGE BECHHOEFER: I just wanted to make sure the record is clear.

MR. PIRFO: Yeah. But it's referred to -- I was looking at various places while we were talking and looking at various references and I'm not -- didn't have a chance to talk with Mr. Taylor. Mr. Taylor, as long as he's here I might as well bring him up, did not use

this in preparation of his testimony, but that's not to say that it's not part and parcel of NUREG 0948 which is another issue.

JUDGE BECHHOEFER: Right.

MR. PIRFO: But I just wanted to make the Staff's position clear with regard to admission of Applicants' Exhibit 63 --

JUDGE BECHHOEFER: And EN-619 itself has substantial references to the task force report, quotes of lots of it.

MR. SINKIN: Mr. Chairman, there is no question that Mr. Stanley assisted the Bechtel task force. CCANP 104 is Mr. Stanley's response to their report and in that response he says in many instances these Bechtel assessments appear to reflect modified designs subsequently accomplished by Brown & Root rather than the actual state of design reviewed by Quadrex in March 1981. Now, that's Mr. Stanley's view of whether the Bechtel task force report mirrors what Quadrex was doing. He views that there were modified designs.

Mr. Chairman, I do have further response.

JUDGE BECHHOEFER: Mr. Sinkin?

MR. SINKIN: Yes. Our further response, Mr. Chairman, was on at least two points.

First of all, given the Applicants'

representation that the special task force is not part of the project team, therefore their competence doesn't relate to the competence of Bechtel, I think we would change our position from admitting it for a limited purpose to striking it altogether.

The second thing is that there's a position being put forward here by the Applicants that I think we need to look at very closely and that is that if someone comes along later and with further information determines that a finding is not reportable, that that somehow is probative of whether the person who made the decision on potential reportability made the correct decision. I don't think that that's the kind of inquiry we should be making.

What you want to know is when that person made the decision it was not potentially reportable, what did they know? That's the only criteria, what did they know? If they knew absolutely nothing and took a guess and said it wasn't reportable without doing a thing about it and later on the information comes in that it's not reportable, that doesn't make the fact that they took a guess more credible.

And I see that that's the basic problem we have with all of these documents marching into the record here. They're all coming in to say, well, we

looked at it later and we looked at some stuff that Quadrex didn't see and probably Jerry Goldberg didn't even have available on May the 8th, but that tells us that it wasn't reportable and, therefore, we made the right decision on May the 8th.

That's not the way the inquiry goes. It doesn't go backwards in time. It's fixed in time to that 24-hour period. What did he know? What did he decide? Based on what he knew, did he make the right decision? I don't think that these kind of reports are relevant to that inquiry and I think that is specifically the inquiry in the contention.

When you're citing 50.55(e)(ii) and talking about 24 hours, that's the contention. That's what we're talking about. In terms of why these reports were going to come in and why we didn't have a hearing in 1981 or 1982 about Quadrex, what the Board was saying was they didn't think that the handling could be separated easily from the substance, so we'd have the handling and the substance all at the same time.

Well, we reached the point where the Board said Brown & Root's no longer on the job and we're not interested in the substance. The substance went by the wayside. And that's what these reports were primarily designed to address was the substance of Quadrex, not

the handling.

As a matter of fact, the EN-619, which is coming along next, wasn't even addressing the reportability at all directly. Tangentially it might, but that wasn't even the purpose of that study. What was going to be coming in was evidence on whether the resolution of the Quadrex findings was adequate or inadequate. As far as we're concerned, we were not on notice that what we were litigating here in this proceeding was the adequacy of the resolution.

So, every time they come up and say, yes, but later evidence showed that it wasn't reportable, we're put in the position of having to challenge that evidence or let it go and be used as proof you didn't have to find a potential reportable. That means we were supposed to be prepared to litigate whether the resolution of the Quadrex findings, how they were resolved by Bechtel and Houston Lighting & Power was adequate. That issue was specifically excluded from this proceeding, but now these documents are coming in and raising it again.

(No hiatus.)

MR. FRANTZ: I'd like to correct several misstatements --

JUDGE BECHHOEFER: Well --

MR. FRANTZ: Okay.

JUDGE BECHHOEFER: The Board has decided that we will let the document in. We do note that the weight of the particular -- the weight of the discussion of particular findings in terms of our contention may depend on what information in fact was relied on to reach that conclusion. And that, of course, is open for examination of the witnesses. And irrespective of -- I mean, we agree that the information that HL&P had to act on information known to them in May, and that's a subject that can be inquired into. So we will allow this document in.

(Applicants' Exhibit No. 63
admitted in evidence.)

JUDGE SHON: One more thing I would like to know about the document, perhaps somebody can direct me to the proper page in it. In almost every task force report I've ever seen, the task forces identify by name and usually by profession; I can't find the list of who the people are who did this in the report. Is it there and I'm just missing it?

DR. BERNSEN: I don't believe it's in the

report.

JUDGE SHON: Isn't that kind of strange, an anonymous task force? Usually they put their names on their reports.

DR. BERNSEN: I don't know whether it's strange or not. Typically, and I wouldn't say this is always the case, but typically in our reports, we don't identify the members of the team. It really reflected as the report indicates, the effort of this group of nine people plus their interaction with and a lot of review by other senior members of the Bechtel organization to corroborate their determinations with regard to industry and current practice. So that it the task force did not operate entirely in an isolated environment and therefore there were other people involved.

But as far as I know, it's not our normal practice to identify all the players in a review of this sort.

JUDGE SHON: Did you actually head up the task force, Mr. Bernsen?

DR. BERNSEN: No, I did not.

JUDGE SHON: I see. What sort of person did; was he a lawyer or a physicist or an engineer or a --

DR. BERNSEN: He was a nuclear engineer, Ray Ashley, has been a chief nuclear engineer in one of our

divisions for many years, very knowledgeable nuclear licensing, radiation shielding protection, and nuclear systems analysis and project engineering experience besides.

MR. FRANTZ: Judge Shon, I'm sorry to interrupt but you may not have seen this before. But in the Applicants' answer and objections to State of Texas' first set of interrogatories to Applicants or Quadrex, the answer to Interrogatory 36, we identify the members of the task force.

JUDGE SHON: Thank you. That's the kind of thing I wanted, somebody to tell me about.

MR. FRANTZ: Is Ray Ashley, Paul Speidel, Mario Alvarez, Steve Case, Rick Ellis, Orhan Gurbuz, G-u-r-b-u-s, b-u-z, I'm sorry; Dave Haught, Subash Khurana and I'm not sure how that's pronounced.

MR. PIRFO: Can I ask that that be spelled?

MR. FRANTZ: S-u-b-a-s-h, the last name is K-a-h-u-r-a-n-a; and Larry Johnson.

JUDGE SHON: This Ray Ashley, did he work for Atomics International some years ago?

DR. BERNSEN: Yes.

JUDGE SHON: I think I know him personally.

MR. FRANTZ: I'd now like to identify for the record, Applicants Exhibit 64, which consists of a letter

from HL&P signed by George W. Oprea to John T. Collins, regional administrator of Region IV; attached to that is a letter to Houston Lighting & Power, Mr. -- to the attention of Mr. S.M. Dew from Bechtel Power Corporation, and signed by R.L. Rogers. Attached to that letter is work package title review of the Quadrex report, log No. EN-619.

(Applicants' Exhibit No. 64 marked for identification.)

MR. FRANTZ: I believe the Board and the parties have already been provided copies of this exhibit and I've given copies to the reporter.

DIRECT EXAMINATION CONTINUED

By Mr. Frantz:

Q Mr. Lopez, do you have a copy of this exhibit before you?

A (By Mr. Lopez) Yes, I do.

Q Is this exhibit the same exhibit that you identified as Applicant Exhibit 64 on pages 7 through 9 of your prefiled testimony?

A (By Mr. Lopez) Yes, it is.

MR. FRANTZ: The Applicants move the admission into evidence of Applicant Exhibit 64.

MR. SINKIN: Objection. Mr. Chairman, EN-619 is even more clearly based on different information than Quadrex relied on than is the Bechtel task force report. Furthermore, as stated in the testimony of these witnesses at page 7, 11, 28, the primary purpose of EN-619 was not to review the Quadrex report to determine reportability.

Mr. Lopez so testifies at page 7. line 27, going over to Page 8. Furthermore, Mr. Lopez testifies at Page 8, line 6, that EN-619 did not focus upon Quadrex's comments on the practices, policies and procedures of Brown & Root because they were not applicable or germane to Bechtel's activities.

Well, that phrase is the essence of how Quadrex describes their generic findings at 2-15 of the Quadrex report, which says, regarding the generic findings, that these are a clear indication that certain practices, policies and procedures adopted by Brown & Root continue to have a generic impact on most if not all of the technical disciplines.

So if EN-619 was not focused on the practices, policies and procedures of Brown & Root, it was not focusing on the generic findings.

Again, the only basis for entering the document would be some supposed relevance to the specific

disciplne findings, and again all we're doing is loading up the record with somebody else coming along still later with more information available with Bechtel having been on the job for a long time, with people working with far more knowledge than the Quadrex reviewers ever had, now writing a report and saying what they think the real situation was. And what we're setting up here is in some senses, Quadrex versus Bechtel; when that's not the inquiry.

The inquiry is what did the Houston Lighting & Power review team know on May the 7th and May the 8th from Quadrex; Bechtel wasn't even on the job and was nowhere around.

But here comes another document. We'll make our standard objection that the record is being loaded up with these kinds of documents and that it's not -- it's not the issue in the proceeding. Furthermore, I note in EN-619, that perhaps it's not even EN-619 that we should be looking at.

In the front of EN-619 there's a document, it's the summary of the EN-619 study, page 14 of 17, talks about related work. And it says that many of the compliance work packages include evaluations and status appraisals on concerns which are also the concerns of Quadrex findings. And then it lists the work packages

that are related to this work package and the subjects that they contain.

EN-600, item B, Incident Review Committee issues. Now those might be relevant to this proceeding; items from the Quadrex report that were referred to an Incident Review Committee later by Bechtel as potentially reportable. But a whole two volume report that doesn't even purport to be addressing reportability simply cannot be worth putting into the record of this proceeding.

JUDGE BECHHOEFER: Mr. Frantz --

MR. FRANTZ: Yes, Mr. Chairman, again, I think as the Board has ruled with respect to the previous exhibit, Mr. Sinkin's arguments largely go to the weight to be given to this exhibit, not to its admissibility.

Mr. Sinkin is free to argue in his proposed findings of fact and conclusions of law that this document should not be given much weight because it does, in some cases, include after the fact information, information developed after May 8th, 1918, in a very few cases. But that doesn't again preclude us from presenting our case on reportability; we're entitled to have in the record information which we feel is relevant and probative to the case we're trying to prove; and Mr. Sinkin can argue later on during the proposed findings and fact and conclusions of law that that information

should really not be given much weight.

If report, itself, I think is clearly relevant and material; it addresses each of the Quadrex findings, although the primary purpose of the report was not to determine reportability of the findings.

If Bechtel, during the preparation of this report and during its evaluations to support preparation of the report, had found anything that was reportable, a report would have been submitted; this document indicates that no such things were found; that's clearly again relevant and probative to the issues in this proceeding.

Many of the discussions of the findings here indicate that Quadrex was merely supplying recommendations for improvements and in Brown & Root's practices and policies and not indications of deficiencies

That, again, I think is clearly relevant and material to reportability. Therefore, we think the exhibit should come in.

MR. PIRFO: Staff has no objection to its admission. We point out again that we do rely, as the Board pointed out, that we do rely on NUREG 0948.

I, Mr. Chairman, if I can make something clear. By pointing out to the Board NUREG 0948, I'm not making clear. My feeling is that that information that we

viewed it as the Staff viewed is as relevant is contained in 0948 will and has been relied on, so to the extent that the Board would -- how should I put this. If we get caught in the catch the two of striking 619, and then striking NUREG 0948, we have problems with that.

What I'm saying is that the reason we have no objection -- I should say the reason we do not have strenuous support for the admission of 619 because we feel it's contained to the extent relevant in 0948, that's our position.

Have I made myself clear? Our position is that it is probative and relevent. Of course, in a voluminous document like that, there are are a number of things which are not probative and relevant, of course. But to the extent there is probative and relevant material in 619, it's contained in 0948; but that's not an arguement for striking 619.

I'd rather respond to questions now.

JUDGE SHON: If we did strike 619, in your opinion, would there then be a substantially diminished basis for the actual material in the NUREG document?

MR. PIRFO: I'm not sure those are -- I'm not sure that examination is co-extensive. I'm not sure if you can, the fact that 619 were stricken means that NUREG 0948, which is based in part on 619, by definition, is

stricken, or is undercut because the underlying documents were stricken.

I mean, draw an example. A witness may base their personal knowledge on a number of documents that is competent to come into court, whereas the documents themselves cannot come in and because they're not relevant to the proceeding but the facts that the witnesses testimony is based on the documents would still come in.

JUDGE SHON: If, for example, NUREG 0948 used numbers derived in part from the Chemical Rubber Publishing Company's Handbook of Chemistry and Physics, I would not think it necessary to admit the Handbook of Chemistry and Physics in the case in order to substantiate those portions of NUREG 0948 that were based on it.

Is this a similar thing, that it's based in part on that, but that that is because its authors accept this as true and we don't need it in the case?

MR. PIRFO: I'm not sure that's the same thing. Of course we can't -- I want to avoid the situation where we're arguing too strenuously for 619 when we've relied -- but we have relied on 619.

I mean, it's our position that NUREG 0948 to the extent we needed 619 we've relied on it. But I think

that it is -- the entire document, giving the certain exceptions I alluded to before, is probative and relevant to whether these things were reportable, potentially reportable, at that time. And as you have ruled with regard to Applicants' Exhibits 63, this merely goes to weight.

And Mr. Sinkin, of course, is free to qualify particular findings as he goes through.

JUDGE BECHHOEFER: We've decided not to admit that document. We will not admit Applicants' Exhibit 64.

MR. FRANTZ: May I suggest, Judge Bechhoefer, that this is a good time for a break?

MR. SINKIN: That's fine.

JUDGE BECHHOEFER: Yes, fifteen minutes.

MR. FRANTZ: Before I do that, maybe we should just mark for identification one additional exhibit which will hopefully be admitted after the break just so that they may see the exhibit beforehand. It's not been previously shown to the parties or the Board.

I'd now like to mark for identification Applicant Exhibit 72.

(Applicant Exhibit 72 marked for identification.)

MR. FRANTZ: For the record, Applicants' Exhibit 72 consists of a interoffice memorandum from

Bechtel Power Corporation to B.L. Lex, from R.L. Ashley, dated November 24, 1982. Attached to that letter is a document with a cover sheet entitled "Disposition Of Brown & Root And Quadrex Comments On The Bechtel Task Force Draft Report," quote "An Assessment of the Findings in the Quadrex Corporation Report," dated November 1982.

Attached to that are 30 pages. I may note also, for the record, that what Applicants Exhibit 72 is an exerpt from a longer document. We have not included pages which address the Brown & Root comments on the draft task force report.

The exhibit which we have here only addresses the Quadrex comments on the draft task force report, which CCANP, by the way, has moved into evidence and was accepted into evidence and accepted into evidence A CCANP 104.

The parties have a chance to review this over the break and perhaps we can come back and do some further questions with the witnesses and move this into evidence.

JUDGE BECHHOEFER: All right. Let's break fifteen minutes.

(Recess.)

JUDGE BECHHOEFER: Okay. Back on the record. Mr. Frantz.

MR. FRANTZ: Thank you.

Q (By Mr. Frantz) Dr. Bernsen, are you familiar with Applicants' Exhibit 64?

A (By Mr. Bernsen) Yes, I am.

Q 72, I'm sorry.

A 72.

MR. SINKIN: Still trying.

Q (By Mr. Frantz) Would you please describe what Applicants Exhibits 72 represents?

A (By Mr. Bernsen) The Applicants' Exhibit 72 is report from the members of the Bechtel task force describing how they dispositioned the Quadrex comments on the draft task force report.

Q The Bechtel task force report was issued in March of 1982. Would you please explain why this document was not issued until November 24th, 1982?

A As I recall, project management, the Bechtel South Texas Project management, in reviewing -- in looking at the task force report, concluded that there was not a complete trail to indicate how the draft task force comments, how the Quadrex comments were dealt with in completing the Quadrex report, and we felt it would be desirable for record purposes to have the task force compile in one location the reasons for their specific dispositions on the Quadrex comments.

Q Do you agree with the task force dispositions of the Quadrex comments in Applicants' Exhibit 72?

A Yes, I do.

MR. FRANTZ: Applicants move into evidence Applicants Exhibit 72.

MR. SINKIN: No objection.

MR. PIRFO: No objection.

JUDGE BECHHOEFER: Applicants' Exhibits 72 will be admitted into evidence.

(Applicant's Exhibit No. 72 admitted into evidence.)

MR. FRANTZ: I do have a few additional questions on direct examination.

Q (By Mr. Frantz) The testimony of Robert J. Taylor, pages 44 and 45, states that HL&P notified the NRC of a potentially reportable deficiency related to the essential cooling pond on October 19th, 1982, and that HL&P withdrew this report on December 9th, 1982.

Did this potentially reportable deficiency involve the same concern expressed in question N-17 and finding 4621 N in the Quadrex report?

A (By Mr. Lopez) I think I can address that. Question N-17 deals with Quadrex's concern that in their discussions with Brown & Root, they had not been able to identify that a calculation involving simultaneous

orderly shutdown of both plants had not been violated -- or had not been analyzed by Brown & Root, and were raising that question.

They were also asking questions relative to calculations relative to the civil calculations for the sizing of the pond. The matters that were under discussion, under investigationmin the potentially reportable item that you addressed earlier and that I have seen in the NRC testimony, dealt with matters dealing with the essential cooling pond but would not -- not these issues here.

Those matters were based upon an early 1982 NUS analysis of the essential cooling pond, which had demonstrated and which had been developed because of changing heat loads.

One of the matters coming out of the HVAC deficiency that we have discussed in the direct testimony was that certain safety related HVAC needed to be added. The process of looking at that and dispositioning that it was determined that a additional heat loads, safety related heat loads, as loads to the essential cooling pond.

NUS performed that re-analysis. And in so doing, had identified that for a short period of time, something on the order of four hours or less, the

predicted temperature of the essential cooling pond would be higher than the values that were specified in the procurement of some safety related equipment which was to be served by water coming from that essential cooling pond.

So the issue that was being raised at that time was whether or not that equipment, which was being serviced by that essential cooling pond water which was being predicted to be in excess of the specified values for approximately four hours, a little bit less than four hours, was in any way, that equipment in any way been delayed by that increased temperature.

So the matters that Quadrex were raising were not related to that NUS analysis or that particular problem. It was later determined, I should note parenthetically and the reason why it was withdrawn that in evaluating that equipment, the equipment vendors who happened to be Westinghouse and some vendors of some heating ventilating and air conditioning equipment, determined that that short period of time for those temperatures had no safety implication to the either the performance of that equipment or its equipment qualification.

Q Thank you. Mr. Lopez, I would like to refer your attention now to question, answer and assessment

H-23 in the Quadrex report.

MR. SINKIN: I'm sorry, what are you referring to.

MR. FRANTZ: H-23.

MR. SINKIN: In the Quadrex report?

MR. FRANTZ: In the Quadrex report, yes.

Q (By Mr. Frantz) Did you review this question answer and assessment in preparing your testimony?

A (By Mr. Lopez) Yes, I did.

Q Would you briefly describe the subject of that question answer and assessment?

A Okay. I reviewed this in particular looking at the statements made by Quadrex under -- in their assessment, indicating that Quadrex was raising a question as to whether or not, this is under I guess item A on the Quadrex assessment portion of that question, in which Quadrex was raising the question of whether or not the -- if I can find it, if the only -- if the drainage system and its level indication was the only means for leakage detection in this safety related fluid process system, that is the essential cooling water system, then it would be their opinion that standard review plan SRP 9.33 would require that that drainage system and instrumentation be safety related.

They did not identify that that was in fact the

case; that they had any reason to believe that that was the only means. They simply indicated that if it were the case, that would be there -- that would be their conclusion.

So in the first place, you know, that identified that to my satisfaction that no deficiency was in fact being identified by Quadrex.

Further, from my past experience, in review of this standard review plan and the way that that is normally dealt with in designs, at least those to which I am familiar, you know, I find that it is uncommon for that particular standard review plan position to be implemented in the manner that Quadrex was proposing, that is to qualify as safety related drainage systems. That's not the normal practice.

Typically, there is no reliance on drainage systems as the only means of identifying breakage from safety related fluid process systems.

So I will admit that I simply initially assumed that that would not be the case. I went further, however to try to determine whether or not in the specific instances that were being addressed by Quadrex that might in fact be the case. What I did was look at process and instrumentation diagrams, the acronym we use M&ID's, as well as system design descriptions which were in place at

the time of the Quadrex review; I looked at particularly the process and instrumentation diagrams for the essential cooling water system and for the drain system as well as the system design description for the essential cooling water system, to see whether or not in those design documents, I found evidence that Brown & Root was had the design such that it was relying upon the drainage system as the sole means of identifying possibly leakages from that system. I found that not to be the case, as I had originally suspected that it might.

Q And what results did you reach regarding whether or not that instrumentation needed to be safety related?

A Based upon the information that I just provided, it was my determination that the standard review plan, 9.33, requirement for safety relatedness of that drainage system did not apply and as such need not be safety related.

Q That includes also the sump pumps?

A Yes.

Q Thank you. Now I'd like to refer to your attention to finding 4.3.2.1.(h).

Dr. Bernsen, is a procedure requiring the identification of support systems necessary to satisfy that criteria in Appendix B to 10 CFR Part 50?

A (By Mr. Bernsen) No, it's not.

(No hiatus.)

Q Mr. Lopez, did B&R, in fact, have a procedure requiring the identification of support systems?

A (By Mr. Lopez) Yes, they did.

Q Would you please describe that procedure?

A The procedure in particular that I'm making reference to is the procedure that described how personnel at Brown & Root should prepare system design descriptions. That procedure was in place at the time of the Quadrex review and indicated the requirement for personnel preparing system design descriptions to identify the support systems needed to support that particular system. It turns out that it made no distinction as to whether or not this applied to all systems, whether they be safety-related or not, but it indicated that support systems should be identified in the SDD.

Q Have you conducted a review to determine whether the SDD's did, in fact, identify support systems?

A Yes, I did.

Q Would you please describe the results of that review?

A I reviewed SDD's, mechanical fluid process, electrical and instrumentation type SDD's which were in place at the time of the Quadrex review and determined

that this requirement of the SDD procedure was, in fact, being met with regard to the SDD's.

Q Thank you.

I'd now like to refer you to finding 4.1.2.1(e).

MR. SINKIN: Would you do that again?

MR. FRANTZ: What?

MR. SINKIN: The number.

MR. FRANTZ: 4.1.2.1(e).

Q (By Mr. Frantz) Did you take into account the subject of this finding in preparing your testimony with respect to finding 3.1(d)?

A (By Mr. Lopez) Yes, I did.

Q Now I'd like to refer you to finding 4.3.2.1(c).

A Okay.

Q Did you take into account the subject of this finding in preparing your testimony with respect to finding 3.1(g)?

A Yes, I did.

Q All right. I'd now like to refer your attention to finding 4.5.5.1(c).

MR. PIRFO: I'm sorry, what was that again?

MR. FRANTZ: 4.5.5.1(c).

A (By Mr. Lopez) All right.

Q (By Mr. Frantz) Did you take into account the subject of this finding in preparing your testimony with respect to finding 3.1(b)?

A 3.1(b)?

Q Yes.

A As in bullet?

No, I did not.

Q I'd like to perhaps refresh your recollection, Mr. Lopez. If you'll refer to finding 4.5.5.1(c) --

A Oh, I'm sorry, you said C?

Q Yes.

A I was referring to 4.5.5.1(d).

Q Oh, okay.

A I'm sorry.

MR. SINKIN: Articulate clearly.

DR. BERNSEN: We heard D.

Q (By Mr. Frantz) With respect to finding 4.5.5.1(c), did you take this finding into account in preparing your testimony with respect to finding 3.1(b)?

A (By Mr. Lopez) Yes.

Q I'd now like to refer to finding 4.6.2.1(d) as in dog.

A I found 4.6.2.1(d).

Q Did you take into account the subject of this finding in preparing your testimony with respect to

finding 3.1(c)?

A I note that the discipline finding takes particular reference to question N-1. And in preparing my testimony relative to 3.1(c), I took into account the relevant portions of that question.

Q Thank you.

I'd now like to refer you to finding 4.6.2.1(j).

A Yes.

Q Did you take into account the subject of this finding in preparing your testimony with respect to finding 3.1(b)?

MR. SINKIN: 3.1 --

MR. FRANTZ: B as in boy.

A (By Mr. Lopez) Yes, I did.

I would also comment that that particular reference to a portion of 3.1(b), the question of calculations containing errors, was also a subject of a later generic finding. I believe it was the one that was mislabeled, I believe.

MR. SINKIN: i.

A (By Mr. Lopez) Yes, the one on nuclear related analysis, I took it into account in reviewing the question of calculations containing errors in both of those.

Q (By Mr. Frantz) Would you please explain why finding 4.6.2.1(j) does not lend support to a conclusion that finding 3.1(b) is reportable?

A Okay. It's going to take a little time. Let me see if I can try to express this as best I can.

The Quadrex concern, and it's summarized at the bottom of their assessment, was that with regard to an analysis in the isolation valve cubicle, so-called subcompartment analysis, relative to environmental conditions in that specific structure, the Quadrex assessment was, in my opinion, fairly sweeping. They summarized that the wrong problem had been solved, that the wrong methodology had been used, and that the input data which was used was incorrect.

Further, in their discussions of the assessment, they further indicate that the design verifier for that work had accepted these, in their view, errors or omissions and accepted that calculation.

My own review of this situation does not support that, those particular conclusions. And let me try to explain why I feel that.

In reviewing this information, Quadrex was indicating that they felt the wrong problem had been solved because they made reference to what they felt was an analysis different from what had been committed to in

the FSAR. I investigated that by looking at the FSAR as it existed at the time Brown & Root was being questioned by Quadrex relative to this matter. My own review of the FSAR indicates that contrary to the statements included in the Quadrex assessment, the analysis that was being reviewed was, in fact, the analysis which HL&P in Amendment 2 to the FSAR in October of 1978 indicated that it would perform.

So, I don't agree, in the first place, that the wrong problem was being solved. It was, in fact, the problem that had been committed to as a result of some fairly lengthy meetings with the NRC as to how the South Texas Project would deal with an evolving technical issue which is -- which was the proper treatment of environmental conditions in areas which normally are treated as so-called super pipe regions; that is areas where full dynamic effects of pipe ruptures are not normally postulated.

The FSAR identifies the resolution of that problem by HL&P's commitment to perform this analysis. The analysis that's being referenced here appears to be that analysis.

Secondly, there was a concern expressed by Quadrex relative to the use of the RELAP 3 model as the method for performing this analysis. And I believe that

to be the basis for their concern that the wrong methodology had been used. This analysis was prepared in the '77-1978 time frame utilizing the code which in that time frame was considered to be an acceptable methodology for performing this work. And in my opinion, for the particular application that it was being used, was probably still acceptable. Furthermore, in their correspondence to the NRC indicating that they would perform this analysis, the South Texas Project had indicated their intent to use RELAP 3 for performing that analysis. So, they had clearly identified that they were using or intended to use this RELAP 3 model.

So, I also feel that the assessment that the wrong methodology had been used was inappropriate or not fully justified. Clearly, the point that Quadrex was attempting to make was that in the 1981 time frame, the NRC was questioning on a case by case basis the use of the RELAP 3 model for doing some subcompartment analyses and for some particular applications, particularly inside containment analyses had indicated that a more modern, if you will, more sophisticated analysis using later computer programs was their methodology of preference. I don't believe that and it's not my opinion that that necessarily would have found that this analysis would have had to have been redone. But once

again they had clearly identified what their intent had been and what they had followed up on.

And, lastly, the comment relative to the input data having been used as being incorrect. The resolution of the discussions with the Nuclear Regulatory Commission as to what analysis should be done indicated, and there may be some confusion with the way it's described in the Quadrex description of the B&R response, that this area, that is so-called super pipe where we do not normally assume dynamic effects of pipe break, that the NRC established that their requirement that in spite of the normal at that time philosophy, that they required that an analysis be done of that pipe rupture nonmechanistically. That is to say a break of some sort and a release of the mass energy from that piping system into the compartment needed to be evaluated to determine the environmental conditions that would occur as a result of that break.

When I say nonmechanistically, what I'm saying is that in a normal pipe rupture analysis, that if you assume a break in the pipe, you also deal with the whip and jet impingement effects of that break. They were not requiring that that be done, they were simply requiring that the massive energy of that steam line be assumed to occur and go into that room.

Now, in reality, to describe a crack analysis versus an analysis as agreed to with the NRC, the only real difference we're talking about here is the size of the crack. A normal crack analysis is not nearly as large as the one that the NRC required to be performed here.

So, I believe that Quadrex in identifying a main feed -- main steam and main feedwater crack analysis in this reference was dealing with a nonmechanistic analysis of blowdown into that room without having to deal with the so-called jet impingement or dynamic effects.

In any event, the response from STP relative to that analysis was that they would, in fact, perform that analysis, that they were going to use the blowdown data that was available to them at that time, which happened to be blowdown data generated at the stage of the PSAR for a double-ended main steam line break. It was very conservative to do so because the analysis that the NRC was requiring did not require that large amount of blowdown into the compartment.

And I believe that Quadrex is commenting here as to the incorrectness of that decision based upon their judgment that an over-conservatism was inappropriate, not that the results were inadequate as a

result, only that they were more conservative than they needed to be.

Once again, the statement in the correspondence with the NRC by the South Texas Project clearly identified their intent to utilize this blowdown data, making particular reference to the tables in the PSAR where it was derived, the fact that it was based upon an even larger break than had been required by the NRC, and that it was based upon a double-ended break rather than a single-area break. So --

Q Thank you, Mr. Lopez.

JUDGE SHON: Could I ask you one question, Mr. Lopez.

MR. LOPEZ: Sure.

JUDGE SHON: One or two, at any rate.

The Quadrex assessment refers to what it calls an obvious error in that a highly super-heated steam with an enthalpy of 1306 BTU per pound was used as input to RELAP 3 when, in fact, they say RELAP 3 must start with an all steam 212 degree fahrenheit environment. Did you consider that, that the code might not have been capable of handling start with a super-heated steam of that high an enthalpy?

MR. LOPEZ: No, I would not.

Mr. Bernsen may want to comment as well.

DR. BERNSEN: I don't think that would be a significant issue in this case. We're not really sure what they mean by starting with 212 because the steam conditions would be normal secondary pressure conditions which would be in the range of 1,000 PSI and the blowdowns typically from steam lines would initially be super-heated a little bit.

JUDGE SHON: Secondly, we had Mr. Stanley here on the stand yesterday and I asked him specifically whether the conditions were grossly conservative because it seemed intuitively that a double-ended pipe break would be a more rigorous environment than a crack. And he seemed to believe that the thing was counter-intuitive, that the double-ended pipe break for some reason or other was less severe than the crack.

I don't have the exact transcript reference, but --

MR. LOPEZ: I recall that discussion. I'd like to begin the response to that by pointing out several things.

In standard NRC practice with regard to pipe rupture, particularly with regard to environmental conditions, the NRC has established that, you know, the limiting case is the one that should be used. They specifically have identified in their standard review

plans, and in particular STP had taken note of that in the FSAR, that in areas where a, if you will, a full area type or double-ended type break was used, that there was no need to do further less limiting cases like moderate energy or leak crack type breaks. And that had been particularly noted in the FSAR and is common practice.

It is generally understood that if you are in an area in which the only pipe ruptures that you have to postulate are, in fact, leakage cracks, they may, in fact, become the limiting case. I'm not aware of an instance where one must postulate a full-ended break and find that -- would find that the moderate energy or leakage type crack break would be more limiting.

JUDGE SHON: In your opinion he was simply wrong?

MR. LOPEZ: I would not have characterized the description of having to do both analyses as being correct.

JUDGE SHON: Thank you.

That's all I wanted to ask, Mr. Frantz.

MR. LOPEZ: I want to make one other point. Although it was not in the summary, it was discussed yesterday that the results of all of these things had been reviewed by a design verifier and he had accepted

all of these items which Quadrex felt were in error. You know, I think based upon what I have described, my feeling is that the verifier, assuming he understood all of these things, both the FSAR commitments and the conservatisms in the inputed numbers and the like, would have been expected to accept those as correct. At least I would have expected them to have done so.

Q (By Mr. Frantz) I'd now like to refer you to finding 4.6.2.1(b) as in boy?

A (By Mr. Lopez) Okay.

Q Did you take into account the subject of this finding in preparing your testimony on findings 3.1(b), 3.1(d) and 3.1(i)?

A 3.1(d) was the second one?

Q Yes.

A 3.1(i).

Yes, I did.

Q Would you please explain why finding 4.6.2.1(b) does not lend support to a conclusion that findings 3.1(b), 3.1(d) and 3.1(i) are reportable?

A I'll try. There's a lot of information in this finding. Let me try to take them piece by piece.

The first significant comment that I find is the one that I just discussed that deals with question N-13, the statement that the only environmental analysis

performed by B&R contained a gross error. I made the comments that I feel are appropriate to that.

The second independent assessment there is that obvious errors were also discovered in an NUS analysis for inside containment at question N-1. As Quadrex points out in question N-1, what they were questioning once again was an over-conservatism. They were referencing an NUS analysis that had been performed for main steam line breaks inside the containment and felt that that analysis was overly conservative.

The next major item, once again at N-1, was that the only NUS analysis currently valid is the containment environmental analysis for LOCA. I didn't particularly find that as anything other than an observation.

And the next significant thought there, there's a statement that there is no currently valid mass energy release or environmental analysis for outside containment. It references question N-3. In the first place, I do not agree that that is true. The discussion I just had relative to question N-13 was a specific analysis which Quadrex reviewed which whose primary purpose was to establish mass energy releases and environmental analysis for a location that was outside the containment. So, on its face it's not

true. I think the point that Quadrex was attempting to make was that they expected to see more and they did not find them.

Okay. The next thought there is really a continuation of that. The few analyses previously performed were not for currently postulated breaks or contained errors, referencing N-3 and N-13 again. I think I've dealt with those questions or at least in my belief neither were for the currently postulated breaks and did not contain errors at least in the sense that they might have some reportability or safety significance.

The next major item was that Brown & Root was uncertain of any need to perform analyses for the high energy lines in the MAB. The documents in the FSAR which I reviewed clearly indicate the knowledge on the part of the project that there were high energy lines outside of the containment building and committed to the performance of high energy line analysis for these. I recognize that in their Quadrex assessment, Quadrex points out that they seem to have some difficulty, at least in the discussions that they had with particular people that were being interviewed, as to whether or not those individuals recognized that need. And that upon being prompted by Quadrex, at least in the Quadrex

statement of that, they acknowledged the fact that there were, in fact, lines outside that needed to be evaluated.

Okay. The next major comment once again is one relative to the timeliness of the environmental analyses outside containment. And, once again, I do not believe that there was a question of safety significance other than the -- well, there was no question of safety significance. The question that was being raised was as to whether or not analyses should have already been performed to assist other activities going on.

Okay. There are some specific analyses, some of which have already been discussed at other points relative to particular analyses, performed by the nuclear analysis group indicating a general feeling on the part of Quadrex of concerns of potential for problems. In reviewing the sections, the general section on nuclear analysis, the, if you will, N series questions in Quadrex, I found that most of the concerns that were raised were based upon a concern that the individual analysts that were being talked to in Quadrex' view did not seem to possess the knowledge that the Quadrex reviewers expected that they might as opposed to a situation in which there were, in fact, problems in which these personnel were performing

calculations or had performed calculations that were, in fact, incorrect.

And then I guess at the end there is a statement to the effect that other analyses were either obsolete, insufficient in basis or contained errors. And I think -- and it makes some specific references. In reviewing those, as I've stated before, I think the general philosophy on the part of the Quadrex reviewers, which I believe I recall Mr. Stanley testified to yesterday, included in their judgment that an error included in their mind over-conservatisms, included in their mind differences between the analysis that was being performed versus that which might be expressed or described in the FSAR, whether or not that analysis was, in fact, technically adequate. So, given that judgment, I believe I understand what Quadrex was getting at and that was addressed in my response.

Q Thank you.

I would now like to refer you to finding 4.1.2.4(q).

A Yes, I found it. I'm sorry.

Q Did you take into account the subject of this finding in preparing your testimony on findings 3.1(b) or 3.1(i)?

A I did not take into account the specific

discipline finding.

Q If you had taken into account this finding, would it have affected your conclusions with respect to the reportability of findings 3.1(b) and 3.1(i)?

A Let me review, if I may, question C-12.

Okay. Apparently the portion of C-12 that is captured in that discipline finding reads that the original duct ring calculation did not include the appropriate pressure load. The seismic loading on the return air riser was not analyzed, however, Brown & Root's plan for the reanalysis was acceptable. Both of these problems could be a result of inadequate communication between technical disciplines, HVAC and structural.

I did -- I am aware of the background behind that particular discipline finding or at least the assessment of it in question C-12. The question that was being raised was that the pressure analysis that was done for this, if you will, HVAC duct ring inside of the containment, was a preliminary calculation as reflected in the system design description for the reactor containment fan coolers and ring ducts which was available or was in effect at the time of the Quadrex review.

That system design description identifies the

various pressure loads, differential pressure loads that are to be used in the design of the ring duct and does it at various locations throughout the containment since the ring duct is a fairly large structure throughout the containment. Each of those points within the system design description is clearly identified by an asterisk and a footnote that that information is preliminary and will, you know, as a result of the Brown & Root process of confirming preliminary information in various design documents, including SDD's, would have required reanalysis.

I'm also aware that in the time frame of 1980, the fall of 1980, new analyses were, in fact, being proposed and initial analyses had already begun in that time frame.

So, I assume that in looking at that information, Quadrex was pointing out that that analysis was being redone, the preliminary analysis was being redone and that needed to be factored into the structural design of the ring duct.

Q Why would that have not affected your conclusion with respect to reportability of finding 3.1(b) or finding 3.1(i)?

A Okay. In 3.1(b), one of the items under there, and probably the one that's probably the most

closely related to this issue, is whether or not calculations containing errors are being reviewed and verified as correct with a higher frequency than should be encountered. The information that was being relied upon was clearly identified as preliminary, clearly identified for reanalysis and had been -- and the reanalysis had begun prior to the time that Quadrex began their review.

So, I don't believe that this is an instance in which an error was found as much as the fact that, as committed to, a preliminary analysis was being redone and new values would be available and forthcoming from that.

Q Thank you.

I'd like to refer you now to finding 4.5.5.1(d).

A D as in dog?

Q Yes.

A Okay.

Q Did you take into account the subject of this finding in preparing your testimony on finding 3.1(d) as in dog?

A No, I did not.

Q If you had taken into account finding 4.5.5.1(d), would it have affected your conclusions with

respect to the reportability of finding 3.1(d)?

A Okay. In reference to question M-47, which is apparently the basis that Quadrex used for that particular discipline finding, the question that was being raised there was relative to an analysis that was performed for the ventilation stack from the main steam safety relief valve. The concern that Quadrex appeared to be raising was that the analysis for the sizing of that vent stack had been performed using a computer program identified in all caps V E N T S T A C K, VENTSTACK, that had not been verified.

My review of this indicates that I do not believe that it would influence my testimony relative to the safety classifications for the following reasons:

The calculation that was being performed was being performed to size a non-safety-related component. Apparently what Quadrex was questioning was that this was a non-safety-related component that was the primary means of venting the relief from a safety-related component to the atmosphere. So, they were questioning whether or not it would be appropriate to classify that calculation of the sizing of the non-safety-related component as being safety-related.

For several reasons I don't believe that's appropriate. In the first place, the computer program

and that particular methodology of identifying and sizing the vent stack is quite common. It was a clear safety-related and code break indicating that this vent stack was not safety-related and its sizing would not be a safety -- did not affect the safety function of the safety-related component that it was allowing to discharge.

So, I would not agree that the calculation in the first place needed to be designated as safety-related, and as a result that the computer program that was used to perform that calculation needed to be computer verified or safety-related in itself.

So, I guess, in summary, I do not believe that it would change my -- even though I did not review it specifically with regard to 3.1(d), I don't believe that it would change my conclusions.

(No hiatus.)

Q I would now refer you to finding 4.4.2.2(h).

JUDGE BECHHOEFER: Mr. Lopez, is there a typographical error in Quadrex --

MR. SINKIN: Yeah. It's labeled 4.2.2.2(h), that is the only one that seems to be in the right place.

MR. FRANTZ: I believe that is a typographical error, it's on page 4-32, for the record.

JUDGE SHON: Before we go on, we were wondering, this matter that you just got through with, the vent stack --

MR. LOPEZ: Yes sir.

JUDGE SHON: Would HL&P have known at that time that the only difficulty with the main steam safety relief valve calculation was with a non-safety related component downstream of that, from what Quadrex told them?

MR. LOPEZ: From what Quadrex told them or --

JUDGE SHON: Or what they had available at the time. Did they know that?

MR. LOPEZ: I can't directly testify as to whether or not they knew that. The only thing that I can testify to is that there was certain information available to clearly identify and Quadrex did identify in their response that there was, in fact, a code break.

They recognized that the vent stack was not

safety related. As a matter of fact, of course, they even made a point of stating that if it had been upgraded to an ASME safety class device, that other kinds of designs could, in fact, have been used.

So they had information from Quadrex indicating that Quadrex recognized that it was a non-safety related device. I assume from looking at process and instrumentation diagrams that were available at that time and clearly indicated that code break should have also had that information from that source, although I have no direct knowledge that they, in fact, used those.

MR. FRANTZ: I would like to refer you to Applicants Exhibit 26, this finding, this exhibit with respect to this finding clearly indicates that Brown & Root informed HL&P back on May 7th or May 8th that the vent piping is non-safety related, so HL&P was aware of that.

JUDGE SHON: Thank you.

A (By Mr. Lopez) I guess we were on page 3432 of the -- that's the correct --

Q (By Mr. Frantz) That's correct.

A (By Mr. Lopez) Is labled at 4.2.2.1 and the question was -- would you repeat it?

Q I haven't asked a question yet.

A I'm sorry.

Q In the answer to my questions please focus on that part of the finding which relates to finding or question and answer and assessment H-3 which is referenced in the finding.

Did you take into account the subject of this finding as reflected in H-3 in preparing your testimony on finding 3.1(c)?

A Yes, I did.

MR. FRANTZ: Chairman Bechhoefer, this completes the Applicants' direct testimony of Dr. Bernsen and Mr. Lopez.

Can you complete your cross-examination before lunch?

JUDGE BECHHOEFER: Just off the record.

(Discussion off the record.)

JUDGE BECHHOEFER: Let's break now until, I guess, about 1:30.

(Luncheon recess.)

MR. AXELRAD: Yes, I have one preliminary matter Mr. Chairman. I had indicated that we would be providing to the Board and to the parties, some material relating to the soils audit and I had handed out a package to the parties and to the Board members.

The first item in that package is a letter dated July 30, 1985, from Mr. Goldberg to Mr. Martin in

Region IV, which forwards the revised version of the response to the previous notice of violation, inspection report, 83-24.

And as I indicated earlier today, this will be the substituted exhibit when the soils panel testifies tomorrow. The remaining materials which I have provided are a variety of audit reports which I will just briefly identify.

The first one is audit report C-13-401, which was conducted in July 1984, and which is an HL&P audit of Pittsburgh Testing Laboratory, PTL. The next item is audit report C-11-401, which was conducted during August and September of 1984, and is an HL&P audit of the EBASCO civil/structural activities. We've included the entire audit report.

But with respect to the attachments, we have provided only the soils related additional information, CAR G-508 and the close-out documentation on that, including Bechtel's responses to concerns on soil.

The next one is audit report EQA-113, which was conducted during September and October 1984, and which is an EBASCO audit of EBASCO soils activities.

Can you read back the last one I just gave to you?

(The requested material was read back

by the reporter.)

MR. AXELRAD: The next one is audit report ESI-21-84, which was conducted in 1984, and is a Bechtel audit of EBASCO including back-up documentation on the one identified deficiency.

Next is audit report C-13-501, which was conducted in February of 1984 and is a Bechtel audit of the Bechtel and PTL soils activities, including close-out documentation of SDRB-014 and concerns.

Next is audit report C 16-501 which was conducted in February of 1985 which is an HL&P audit of Bechtel and EBASCO soils activities including close-out documentation of four SDR's and some concerns.

Next is audit report S20-501 which was conducted in June 1985 and is an HL&P audit of Bechtel and PTL soils activities.

And finally is audit reports S25-501, conducted in July 1985, which is an HL&P audit of Bechtel, EBASCO soil activities.

MR. SINKIN: Did you say there was a June document?

MR. AXELRAD: Audit report S20-501, the cover letter is dated July 9, 1985, but the audit, itself, was conducted in June. And those are all of the audits of soils activities at the site which were conducted from

March 1984 to the present. That concludes that preliminary matter, Mr. Chairman.

JUDGE BECHHOEFER: Any other preliminary matters? Otherwise, Mr. Sinkin can begin cross-examination.

CROSS-EXAMINATION

By Mr. Sinkin:

Q Dr. Bernsen, if you would turn to your statement of professional qualifications, in the back of your testimony. I just want to try and get some times on these various positions that you've held.

Starting with the second paragraph, when you arrived as assistant project manager for quality activities on Midland.

A (By Mr. Bernsen) That was in the period from February through June of 1984.

Q And as manager of quality on the Zimmer Project?

A Approximately September through January, September '83 through January of '84.

Q And as assistant project manager, technical, for South Texas?

A My approximate starting time on the South Texas

Project as manager for licensing was, I believe, February -- let's see, '82, and then I don't recall exactly when the position changed to assistant project manager. I think it was about four to five months thereafter, and I completed work essentially completed work full-time on the project in September of '8 -- let me make sure I get the dates right. September '83. These are approximates. There was some overlap in these assignments.

Q Okay. At the very -- on page 3, at the end of the third -- at the end of the first paragraph, if you would just remind me what the initials IVCOR stand for?

A This is the Industry Degraded Core Rulemaking Program.

Q Mr. Lopez, if we could do the same for you, get some times. How long have you been in your assignment on South Texas?

A (By Mr. Lopez) Talking about my current assignment?

Q Current assignment.

A In my current assignment, a little bit over a year. Now, I had other assignments on the South Texas Project prior to that.

Q All right. June or July of '84?

A Yeah. Yes, sir.

Q Now, I see the phrase in your employment

experiences, "design freeze activities." Were you here when Mr. Stanley testified about a design freeze?

A On yesterday's testimony.

Q Yes.

A Yes, I was.

Q Is that the same as your referring to here?

A It's essentially the same. I did not hear him characterize it in great detail. But assuming he was dealing with that aspects of it as covered in the Quadrex report, I believe it's essentially the same.

Q What he was talking about was a process whereby you pull all the disciplines together, you pull in all the drawings, you say, "We're going to fix it like it is now and if anyone wants to change it, it's going to be hard because they're going to have to go through all of us." That's sort of how he described the freeze.

A I think certainly the last aspect of what you're saying is common to that understanding. The specific methodology of establishing what, in fact, is frozen varies from organization to organization.

However, the concept that once frozen, changes become extremely difficult and require significantly greater management oversight before they are approved, that's the sort of commonailty there is between what was described in Quadrex and these activities.

Q And then as assistant project engineer for systems licensing on South Texas, what was the time period for that?

A The time period was July of 1982 until approximately a year ago.

Q And then your Korean experience?

A Okay, that began in approximately either late November or early December of 19 -- let me see if I remember, 1979. And continued in terms of my actual completion of those activities, until the July 1982 time frame.

I should point out, however, that from September of 1981 until July of 1982, I was physically here in Houston acting as the nuclear engineering group supervisor on a temporary assignment. I had at that time not had my duties on the Korean Nuclear Project terminated; my deputy was fulfilling my duties for me. So there was an overlap.

Q And at Palo Verde?

A Palo Verde was from approximately September of 1978 until November of 19 -- did I say '78. Until November of '79, yes.

Q And then the nuclear analysis group supervisor for the Los Angeles Power Division, I assume that's Bechtel?

A Yes. February of 1977 until October of 1978.

JUDGE BECHHOEFER: Where are each of you located?

MR. LOPEZ: Currently?

JUDGE BECHHOEFER: Currently.

MR. LOPEZ: I'm currently located here in Houston. I'm a permanent employee of Bechtel Energy Corporation assigned to the Houston area office. So, you know, I physically live here as well as.

JUDGE BECHHOEFER: Dr. Bernsen?

DR. BERNSEN: I'm physically located in Gathersburg, Maryland in our Eastern Power Division office.

Q (By Mr. Sinkin) The Eastern Division Power Division or the South Texas or the Western.

A (By Mr. Bernsen) That's the Western.

Q Dr. Bernsen, on page 7 of your testimony, question and answer 11, you state that "Bechtel has learned additional information since the task force report which led to a different conclusion with respect to two findings." Are those findings associated with the common instrument air line drawing?

A Yes.

Q And what do you mean by "led to a different conclusion"?

A Well, in the task force report, it was indicated that this may be potentially reportable. And I really should refer it to. But I think that is the case. Let me confirm. Yes, these two were identified as items that -- essentially the same item. But these two continued findings were identified as items that may be potentially reportable and as indicated, they were reported at that time by HL&P.

Since that time, of course, the project learned of other information that changed their conclusion.

Q Was the change in conclusion a change from your assessment that they were potentially reportable or was it a change that concluded they were not in fact reportable, if you understand my distinction?

A I think I would prefer to let Frank explain that, because he's familiar in detail with the IRC process that went along with the consideration of that.

Q Okay.

A (By Mr. Lopez) The identification in the Bechtel task force report of those items as being potentially reportable was based upon their review of Quadrex report, itself, and information which they obtained by interviews with personnel of Brown & Root, the Quadrex Corporation and HL&P.

They looked at that item, in particular

reference to the potential existance of a problem relative to single failure analysis, felt that that required further investigation, and identified it to HL&P and to the project for further investigation. The project initiated, you know, under our procedures, a deficiency evaluation report, to begin that investigation, and upon discussing that item with the Incident Review Committee of HL&P, it was determined that information which the Bechtel task force personnel did not -- apparently did not have, was known to the Incident Review Committee and apparently was also known to I guess what you call the HL&P review team, as indicated in the Brown & Root status sheets that were prepared and available to them; that information essentially dealing with the release for construction status of that particular design. That was not something that apparently the Bechtel task force had available to them.

So from that perspective, they recommended further investigation; that investigation did not take an extensive amount of time as that information was already available. The Incident Review Committee was able to determine that it was not, in fact, a reportable condition.

However, they did process it under the Incident Review Committee procedures, notified the NRC of that

ongoing investigation and within the time frame alloted, we were able to both the project, I say the Bechtel project personnel as well as the Incident Review Committee ascertain the other information.

Q At one point, you said they recommended further investigation. Were you saying IRC?

A No, the Bechtel task force.

Q The Bechtel task force recommend --

A Their categorization of that entire series of category one items was that they either felt they were potentially reportable or required further investigation. And they recognized in -- I believe they even state in the report that they recognized that since they were not -- did not have access to and were not really reviewing the direct documents themselves, were not in the best position of completing a safety evaluation, only recognizing a deficiency or a potential one at least that needed to be determined by someone that did have access to those documents.

Q Well, it wasn't really the responsibility of the Bechtel task force to make a 50.55(e) report. Is that correct?

A That's correct. They had the responsibilities as all Bechtel employees working under our procedures, when they had information which may have that character,

if we have information available, you know, to initiate that process or to identify that to the appropriate personnel, particularly the project or the client organization.

But you are correct in characterizing that that was not -- it was not their charter specifically to make the evaluation, only to report what they found.

Q And in this instance, did the task force, itself, do anything more than report to HL&P that they considered this potentially reportable?

A I do not know. I have no direct knowledge of that.

A (By Mr. Bernsen) I don't know.

Q Do you know if it was specifically the released for construction aspect which changed it from potentially reportable to non-reportable?

A (By Mr. Lopez) That was not the only consideration that went into the evaluation. It was the only one that I saw that was specifically identified in the Brown & Root summary sheets of that time.

In reviewing it in the time frame that is allowed, you know, after the telephone call, if you will, the notification, we found, you know, other reasons to determine non-reportability. But as best I can determine, simply from looking at the Brown & Root

sheets, that was not identified as a reason on that date.

Q Let me --

A At least not in writing.

Q Let me be clear about your position in this event. You say "we found more information." Are you actually involved in this event?

A Yes, I am.

Q You were involved in the evaluation of this for Bechtel?

A Yes, that's right. I was one of the parties, there were a number of the people involved.

Q So then the task force didn't do any further evaluation, but Bechtel personnel did further evaluation?

A Bechtel personnel on the project performed all the detailed investigations.

Q That drawings was what I think you've already referred to as a P&ID drawing.

A Which drawing are you referring to?

Q The one that had the single failure problem in it.

A The drawing that was in the Quadrex report?

Q Right.

A It's my understanding that that was an exerpt of a drawing from the FSAR section 9.4, and from its appearance, you know, granted it's an exerpt. It appears

to be a copy of an P&ID that was converted into an FSAR figure.

It has all the style of a P&ID. There's no -- at least the exerpt does not show a full signature block and margins so I can, you know, but it looks very much like a P&ID.

Q As this event has been testified about in the hearing, it seemed to me that this P&ID if it was -- we will call it a P&ID and trust that it was -- was found in two different disciplines by Quadrex, provided to Quadrex by two different disciplines.

Does that, in your mind, raise a problem even if it hadn't been released for construction?

A As I recall Mr. Stanley's testimony, he indicated that they asked for some of the information from one discipline and it was not provided to them, and that in another discipline, I believe when they were looking at the radiological protection area, this figure as I recall, I could confirm that, I believe, is attached to one of the questions in the --

Q It's R-6.

A R-6, okay. I believe that's correct. And that that's where they identified the problem. Because it was, you know, not or I assume, this is making -- this is a presumption on my part, because it dealt with both the

design of an instrumentation and control system as well as as dealing with, you know, potential radiological releases they identified it in both places in the report.

I don't believe that, and this is common to other situations I found within Quadrex, that they were attempting to identify them as separate concerns, separate issues. There were several places within the Quadrex report where the same finding is repeated from discipline to discipline, where the particular area of issue really relates to more than one discipline's activity. So I don't believe that they dealt with them --

Q Okay, let me abstract the question, then, to more of a hypothetical.

A All right.

Q Your thinking of this kind of -- looking at design documents and you see this kind of drawing, with the single failure not met in a drawing. And you find it in two different disciplines, let's say HVAC is using it, I think there's some exhaust fans involved in that drawing.

A Well, the drawing, itself, is an HVAC drawing if, in fact, is a P&ID.

Q Okay. Granted all of those ifs.

A Right.

Q You find it in HVAC and you find it in

instrumentation and control, as a base drawing that they're using. It doesn't --

MR. FRANTZ: What do you mean by "base drawing."

MR. SINKIN: It's being used as a P&ID would be used. Are you with me up to that point?

A (By Mr. Lopez) I guess I'm not sure what you mean by being used as a P&ID.

Q (By Mr. Sinkin) Well, maybe we get that into the record. How would this document have been used by the HVAC discipline?

A The standard practice with such a drawing is that it is usually the responsibility of one particular discipline, to prepare, you know, if you will, the initial sketches, the initial drawings of such, and provide that drawing for its coordination amongst other disciplines that may have either direct input to it as drawing or may have some need for the information that's going to be put on that drawing for other activities.

And under a review and comment process, in essence get that interdisciplinary input, incorporate that commentary, if you will, and then issue the drawing. Then that one drawing is then available as an issued document depending upon the various status points that they've established for releasability, if you will,

release for use, release for construction, or the like; is available to the potential users of that document for, you know, either later design activities or as a reference, you know, for -- so in that sense, if that's what you are getting at relative to being used by more than one discipline.

(No hiatus.)

A (By Dr. Bernsen) Let me explain. This drawing describes a single plant design detail. It's a specific system and that drawing defines exactly how that system is arranged. What we're talking about is a single detail. It's not a generic thing that's repeated over and over again, it's just one single feature in the design, even though it was picked up by two discipline reviews.

Q Okay. It's a unique drawing.

A One unique --

Q The numbers on the various components will trace directly to that component in the plant?

A Essentially it is a single design feature.

A (By Mr. Lopez) Right.

Q Okay.

In discussing that iterative process that goes on where it makes its way out to construction, what I'm looking for is at what point in that process, if you were to find this single failure still not being met, would you have a quality assurance concern as opposed to when it was released for construction or not?

A (By Dr. Bernsen) Let me try to answer that. I think that we recognize that there are going to be, not necessarily this is one of them, cases where you will find a design error. And single instances, so long

as there's reasonable evidence that they're not the result of a generic situation, are expected and would be treated as a single case of an error and not really evidence of a quality assurance -- significant quality assurance problem. And that's really how we would view this. If there were many instances and things of that sort, then that might be a different situation.

Q This drawing is a fairly developed drawing, is it not? I mean, it's fairly close to being released for construction?

You do have to say something so we get it on the record as opposed to nodding your head.

MR. FRANTZ: Excuse me, Mr. Sinkin. What do you mean by close to being released for construction?

MR. SINKIN: Well, let me start with the first question.

Q (By Mr. Sinkin) There's been a great deal of input to this drawing already; is that correct?

A (By Dr. Bernsen) Well, we certainly can't tell the status of the drawing from the figure that's in the Quadrex report because, as Frank mentioned, the title block, the date, the revision status isn't known. So, you really can't tell what the stage of design is. It may be a very preliminary thing or it may be a fairly well advanced thing.

Q I was really going by the number of unique items identified in the drawing suggesting a lot of work had already been done. Perhaps that's my lack of experience with these kind of drawings.

A (By Mr. Lopez) Well, there's no question there's a lot of design detail shown on that drawing. But without something separate, it would be difficult to determine whether or not that particular drawing, you know, as an FSAR figure -- you know, at what particular stage in its release status of the P&ID it was taken from. For all we know, it may be a simple reconstruction of one particular version that was issued. But I have no way of knowing which particular version it was at the point of work --

Q I understand. Let me try a question, recognizing that I am not an engineer and I'm an amateur at this.

You have an area outlined in dark black on the drawing. If you want to get the drawing in front of you, R-6 is the question.

A We found it.

Q You have the area outlined in a darker thicker line. That's where the problem is. That's the line that's a problem.

A (By Dr. Bernsen) That's the line that Quadrex

refers to, yes.

Q Now, right above the circled area there are two boxes that have dashed lines coming out of them. Are those information signals in this particular drawing? Do you see the dashed lines?

A (By Mr. Lopez) Based upon -- and then this is because my copy is illegible relative to that, but based upon the symbology that I was used to on P&ID's that Brown & Root produced, I think that's correct. The symbology of a dashed line with a box tended to be some tie back to some input, some -- like a signal, you know, an instrumentation signal. But I can't read what it is, so I'm not really sure that that's the case.

Q Right. Okay. My question really goes to the box that's on the lower right side of the drawing. There's a sort of rectangular box and in the bottom part of that box I think there are three solenoids, one next to the other across the bottom.

Do you see what you would think were three solenoids?

A It looks like -- once again, it's somewhat illegible. But it looks like at least three instruments -- you're talking about the lower right-hand corner of --

Q The lower right-hand corner are these

rectangular boxes and in the bottom half of the box there's six circles close to each other in pairs.

A Yes, I think I'm looking at the same area.

Q Okay. My question was should there be an information signal coming to those as well? Is there an error on that?

MR. FRANTZ: Mr. Chairman, I'm going to object at this point. I'm not sure where we're going with all this, why it's at all relevant.

MR. SINKIN: I was just trying to establish if there was a second error in this drawing that had not been detected.

MR. FRANTZ: That's not a subject of the Quadrex finding. I'm not sure why we're discussing it.

JUDGE BECHHOEFER: Mr. Sinkin, what's your purpose on that one?

MR. SINKIN: Well, the Quadrex reviewers found one error in the drawing. If there's a second error in the drawing that they didn't find, it's some evidence that there are other errors that were not detected and that they were more pervasive than perhaps Quadrex thought.

MR. FRANTZ: Mr. Chairman, again, our purpose here is not to attempt to find what may or may not be errors in various drawings in the Quadrex report. Our

purpose here is to address the reportability of certain specific findings.

JUDGE BECHHOEFER: We will sustain that objection on the relevance ground.

MR. SINKIN: Okay.

JUDGE BECHHOEFER: Just for some background, I'd like to ask a question.

MR. LOPEZ: Sure.

JUDGE BECHHOEFER: Now, I'm reading from something which happened to have been produced a long time ago, but would you agree with the following and could you explain if this is true?

"The designs," this is Brown & Root's designs, "were indicated as issued preliminary, issued for use, issued for construction or issued for review. The use of a drawing was dependent on its status. To be involved in construction, drawings must have been designated as 'issued for construction.'"

MR. LOPEZ: Pardon me. Can you repeat that last sentence or last phrase?

JUDGE BECHHOEFER: The last sentence said, "The use of a drawing was dependent on its status. To be involved in construction, drawings must have been designated as 'issued for construction.'"

MR. FRANTZ: Judge Bechhoefer, could you tell

us where you're reading that from, please?

JUDGE BECHHOEFER: I'm reading from the Staff's brief dated August 24, 1984, where it said regarding the reportability of the Quadrex report, at page 9.

MR. PIRFO: What was the page?

JUDGE BECHHOEFER: Nine.

I wondered if these witnesses could comment on their observations as to how --

MR. LOPEZ: I can certainly comment on it.

I don't know particularly the context that that was being used in, but if you're interested relative to the various types of releases that Brown & Root used for various types of drawings, they identified in their procedures the level of, if you will, checking and verification that was required for different kinds of documents, including drawings based upon, if you will, the intended use.

There were some drawings issued which were called released for use which were not to be used for construction and a certain level of checking and verification required before they were issued at that stage. There were different levels, if you will.

In the case of drawings that were going to be issued for construction, they required a higher level of

checking and verification. So, they distinguished the level of checking and verification that they were using. I'm distinguishing those two terms because in the Brown & Root terminology there was a distirction between checking and verifying. But they did a preliminary verification on drawings that were to be issued for construction. They still required final design verification at some later date, but they required as a minimum certain preliminary verifications to be done before they could be issued for construction.

JUDGE BECHHOEFER: Now, if -- were drawings actually stamped with terms such as released for use, released for construction?

MR. LOPEZ: There was typically in the revision block of the drawing the terminology of its issuance. If it was issued for use, that term would normally be put aside the revision number and the date of that issuance. If it was later, say, issued for construction, then that next revision -- it would change the revision number of that drawing and so indicate as the, if you will, the rationale, the reason for that particular revision.

So, I don't recall a separate stamping, you know, visible bold-faced stamping as much as an

indication in the revision block of the drawing.

JUDGE BECHHOEFER: Would all the users be aware of what those revision numbers meant?

MR. LOPEZ: Well, they should be. The procedures relative to use of various documents were identified to end users relative to what revision status that they should expect a document to be in before it could be used for various of their activities. You know, and I certainly -- and I don't know whether or not all personnel were aware of that, but the procedures relative to them doing their -- performing their functions, you know, identified to them the need for them to confirm the actual issue status of documents.

JUDGE BECHHOEFER: How would that be reflected in a situation where preliminary data was being used? Would the documents be marked differently or would there be --

MR. LOPEZ: Which documents? The documents -- the drawings, as an example?

JUDGE BECHHOEFER: Yes, yes.

MR. LOPEZ: You're saying the documents that would have been relied upon in that sense?

JUDGE BECHHOEFER: For construction. If a document were being relied upon for construction but included only preliminary data, would the marking system

or the code system perhaps --

MR. LOPEZ: Whatever, yeah.

JUDGE BECHHOEFER: -- indicate something to that effect?

MR. LOPEZ: Would it indicate that there was -- you're talking about for drawings would it indicate that it was preliminary?

JUDGE BECHHOEFER: Well, that preliminary data was used to develop the drawings, subject to verification later.

MR. LOPEZ: That, from my experience in looking at Brown & Root drawings, was not typical for drawings. It was typical for certain other types of documents that were issued in a preliminary fashion, but not for drawings.

In other words, I would not expect, as an example, to have seen or did not -- I do not recall seeing drawings that were, say, issued for construction which may have had some preliminary information on them that specifically highlighted on that drawing that that particular information was preliminary. That was not common in the drawing practice.

JUDGE BECHHOEFER: Then how is the fact that some verification had to be performed, how was that indicated or wasn't it?

MR. LOPEZ: As I said, I don't believe it was indicated on the drawings. The way that the procedures dealt with that situation was that the design verification process of Brown & Root required all the documents that were subject to design verification to go through this process. And in the process of taking, say, any drawings, even those issued for construction, and providing the final design verification, then there would be the review by the personnel assigned that responsibility, the design verifiers, to assure the final status, if you will, of the information that was on that drawing and in all subsequent documents that were relied upon wouldn't in essence have to go through that same, if you will, cascading type verification process.

If, as an example, a drawing was issued that relied upon preliminary information, and I don't know -- as a matter of fact, I don't believe that I've seen instances where most of the P&ID's in particular had gotten to that final design verification status. But the way the procedure would have indicated that, if in doing a final design verification the verifier determined that all the information was confirmed, even though it may have been preliminary, he would simply, you know, indicate that by the issuance of a final

design verification of that document. There would be no further action particularly required.

If, on the other hand, the document itself indicated that there was some change, then in verifying the documents that relied upon it, and one of the elements in the Brown & Root procedure was that there should be in essence single-tier referencing, in other words, not a whole line of documents all in a row, but there should be a reference to the next document. In verifying that second document when it came time to do the final design verification for, say, a calculation that may have relied upon it, they would have identified whether or not that drawing had gone through final design verification. And if the answer was no, then in doing the final design verification of that later document, they would have to go back and determine what the status was. If there was no change or no action required, they could then proceed with the final design verification of the latter document. If not, they would have to determine what had changed and see if there was any impact at all relative to the assumptions they may have made in their work.

JUDGE BECHHOEFER: Now, if Quadrex was reviewing some of those types of documents, how would Quadrex have known whether preliminary or final data was

being used?

MR. LOPEZ: One of the elements of -- as I mentioned, in the Brown & Root process there were, if you will, iterative design verifications, design verifications that were done in order to allow preliminary information to proceed and be used by -- you know, by various organizations and entities. As part of that, if you will, early design verification were records indicating which references, which documents, other documents had been used as input to that document with an indication of whether or not the information was considered to be final or considered to be preliminary.

In looking at the complete document in the Brown & Root system, you would look at not only the document proper, but the attached sheets indicating what the preliminary or final status was of input. It's in a separate form, I don't recall the number offhand, but in their process they had a separate form that indicated all the references and an indication of whether or not that reference was preliminary or final in nature.

JUDGE BECHHOEFER: Now, when Quadrex reviewed a document, would they have been given the whole package that you just described with the attached sheets or would that vary?

MR. LOPEZ: I really don't know. The only way

that I can reach that judgment, and this is strictly a judgment, is that in a number of instances I saw a reference in Quadrex to what they considered to be the verification status of a particular document. About the only -- if they had that information, then I would assume they would also have the backup documentation that indicated that that verification had been performed, which would include the sheets that indicated what was considered to be preliminary, what was considered to be final.

But I don't -- I have not seen the specific documents that were given to Quadrex, so I really -- I mean, you know, I'm just judging that they received that, particularly in those instances where they were trying to determine verification status.

JUDGE BECHHOEFER: Back to you.

MR. SINKIN: Okay.

Q (By Mr. Sinkin) I missed a word or two you said. What is it that the design verifier does if when he gets the package everything is in final form?

A (By Mr. Lopez) In other words, he confirms the correctness of the preliminary assumptions and whatever else? Is that --

Q Well, let's just try it however you're comfortable trying it. I'm the design verifier. In

comes the package and some of it's already been confirmed, some of it hasn't been confirmed. What do I do?

A You're asking what would you do to complete the verification?

Q As the design verifier.

A As the design verifier?

I guess to describe the process, the document is reviewed in accordance with some existing procedures that describe for the type of document what sorts of things need to be evaluated. The primary emphasis of the verification is to look at the document itself to determine, you know, whether or not the assumptions and the methodology and those kinds of things that went into the development of that document were still valid. And if -- particularly if they relied upon preliminary information, to confirm that that information was still adequate and correct and could be relied upon in some final sense.

I'm speaking now about the final design verification. And, as I said before, I am not aware that very much, if anything, had gotten to that last, you know, final design verification. So, I'm essentially describing what I understood the procedure to say.

So that he would try to determine, particularly if there was -- if there was an identified preliminary piece of information in there, he would have to go back and determine whether or not that information -- you know, let's say, as an example, that there was an indication that they made an assumption about a motor size and they were waiting for the vendor to complete his work and say, well, the motor is actually this particular rating. He would have to go back to determine whether or not they had, in fact, final information from the vendor indicating that the actual size is the following, compare that to the particular document to see whether or not that value was either acceptable as is or some change had to be made, you know, in the document.

So, that would be the process he would go through in essence to check off all the items that were preliminary in nature.

Q When he's finished, what does he put on the drawing that tells anyone else he's done the job?

A He attaches a -- prepares a design verification package which includes, you know, the backup information that he used to try to determine the status. It includes these forms that indicate presumably, if he's finished, everything now being

final, it includes his signature on the issue of that document, and typically it would be a reissue of that document, you know, identifying it as now having, you know, completed that review.

Q Does he work from a list of tasks he's supposed to perform and initial the tasks as he performs them or does he just initial the document?

A He does work from a procedure that describes those elements that he's supposed to verify. There is, in addition to text describing that, some check lists. And I don't recall whether or not the package includes the check list, a copy of the check list with check marks out by the side or not. I just don't recall that part. But, yes, he does work from an established list of things to look for.

Q On page 13 in your testimony, at line 10, you state that we would recommend reporting questionable cases involving any deficiencies in the process of design that could adversely affect the safety of operations as measured by sound engineering judgment, whether or not the design had been released for construction. And then you state that you believe this has been and continues to be the general philosophy applied on the South Texas Project.

Is that the general philosophy since Bechtel

came on the job that you're referring to or are you referring to the general philosophy since 1973 or what is the time frame for that statement?

A (By Dr. Bernsen) It's --

Q Whose statement is it? I believe it's both of yours.

A (By Mr. Lopez) It's both actually.

A (By Dr. Bernsen) It's both.

I think I would say that it's been my observation in association with the South Texas Project that the project has a very low threshold for reporting, substantially lower than I've seen on many other projects that we work on; that they have exercised good judgment and they have been quite responsive to the desires of the NRC inspection and enforcement region in this area.

So, in other words, this observation is one that carries from my original contact with senior members of the project team in late '81 on.

Q Do you have any different observation?

A (By Mr. Lopez) No, I agree with that.

Q On page 13, still line 21, you say first you will identify the primary concerns contained in the finding. That is your interpretation of what you think Quadrex' primary concerns were, is it not? You're not

saying that you went to Quadrex and said what was your primary concern with this finding?

A (By Dr. Bernsen) That's correct.

Q It's your interpretation?

A Our interpretation of their primary concerns.

Q Page 16, answer 20, the first sentence you say, among other things, we understand that B&R established a system design assurance group, et cetera. When you used the phrase we understand, how did you come to have that understanding?

A (By Mr. Lopez) Several sources. One source is the Quadrex report itself. But in reviewing information provided to us as part of the transition, we also saw evidence of the existence of that group's procedures and some of the early work, if you will, in terms of documentation of the design -- system design assurance group function.

A (By Dr. Bernsen) I guess the other input was the information provided to the Bechtel task force in their interaction with HL&P and Brown & Root.

I might add also that they're shown on the organization chart that's in the Quadrex report. The date, of course, would not be.

Q I think that's at page 2-11? That's the chart you're referring to?

A Yes.

Q And you're referring to Mr. Pinto and Mr. Grimes?

A Yes.

Q And where did you get the information that this group was established in February of 1980?

A I believe that comes primarily from the information provided the Bechtel task force.

Yes, it's on page 2-7, at the top, of Applicants' Exhibit 63.

Q You said that from the transition you saw evidence of existence of their procedures in the early work. What was the nature of the early work that you saw?

A (By Mr. Lopez) Under the procedures there were requirements for certain of the activities of the design assurance group to be documented by reviews and marking on various documents. Some of the documents that were turned over during transition bore those markings. And I also looked at at that time the procedure itself, you know, to see if I could understand what the function of the group was intended to be.

Q I guess what I was trying to get to is what did the markings tell you that they had actually done?

A The procedures called for at completion of a

specific activity under the -- into the design assurance, like a Phase I design assurance review, that that notation be, say, on a particular drawing stamped on the drawing saying design assurance review date and initials and everything else.

So, that's what -- it didn't describe the specific action, it was the marking to indicate that the action had been taken in the course of the procedure.

Q I see.

At the time that Quadrex did its study, the design assurance group was not fully integrated into the Brown & Root system; is that correct?

A I don't believe that's the case. I believe that, in fact, they had -- well, they had been in existence presumably, if we believe the information that was provided, for a little over a year. They were performing tasks and there was evidence of that.

I'm not sure how to characterize fully integrated in terms of whether or not they had been functioning long enough to have a major impact in terms of the physical reviews of much of the work that had already proceeded. So, from that perspective, I don't think that they had accomplished a major function of their total scope of responsibility. But I believe they were fully functioning. I'm not aware of any aspect of

their work that was not functioning either because of -- or for any reason. Just that they had only begun to do the large scope of the work ahead of them.

MR. SINKIN: I'll just change the arrangement slightly. I seem to be getting Al instead of you.

MR. LOPEZ: There's been a little problem trying to maintain eye contact with counsel and the Panel as well.

JUDGE BECHHOEFER: Mr. Lopez, just to add, do you know whether any of the documents reviewed by Quadrex had that DAG stamp on it or whatever it would have been? I realize Quadrex didn't look into the group itself, but did the documents they reviewed, any of that have the stamp on it that you referred to?

MR. LOPEZ: I can't recall, Judge Bechhoefer. I just can't. I don't know of any specific instance where they were marked in such a way.

JUDGE BECHHOEFER: Do you know in the areas where Quadrex complained that there was not sufficient I guess the word might be integration of activities between disciplines, do you know that in those cases the stamp was not on the documents they reviewed?

MR. LOPEZ: I don't know that either.

JUDGE BECHHOEFER: Okay.

Q (By Mr. Sinkin) It seems to me when I read

the Quadrex report and I read some of your questions and answers that I'm getting two different impressions. If you look at, for example, question 21 and answer 21, which is a rather lengthy answer so let me give you a chance to familiarize yourself with it.

Okay?

A (By Mr. Lopez) Okay.

Q I guess it seems to me like trains going in different directions. Quadrex to me says we look at -- they say at the very beginning of their report what we're going to look at are system design descriptions, technical reference documents, that sort of item. So, we perform our review and we look at them and we don't find what we want to find in terms of interdisciplinary coordination, systems engineering. So, we say, well, maybe these folks really need an independent systems engineering group to perform that function. But then you come along and you say Quadrex says you have to have a systems engineering group to perform this function. You don't, you can do it with SDD's and TRD's and all of that.

It seems to me your response is not responsive to Quadrex' concern which is an implementation concern as opposed to a methodology concern, and I'd like to get your response to that observation.

A (By Dr. Bernsen) It might be useful for each of us to comment a little bit and perhaps we can speculate.

What we're saying is that these -- the existence of these documents and the fact that they did contain the type of information that we observed indicates that there was a systems function being carried out by the project. The fact that in general the work was found to be adequate, there weren't a lot of significant deficiencies in the design, testifies to the fact that somehow these things were happening.

We are looking at the design perhaps from a little different perspective, recognizing a different status of completion than Quadrex assumed when they entered the process. And, so, perhaps the difference is that Quadrex was expecting to see a lot more detailed information, perhaps a lot more completion than we saw. But we recognized the status of engineering, so that perhaps is one of the reasons for the difference.

(No hiatus.)

Q Do you want to comment on that, Mr. Lopez?

A (By Mr. Lopez) I think so. We believe that these types of documents, system design descriptions, technical reference documents, and the reviewing and comment process, in particular, are, if you will, the work products of interdisciplinary coordination, which is, you know, in the looseness of the terminology, often described in different ways, a multi-disciplinary coordination, systems integration, systems engineering, those kinds of functions, those are the work products.

It's my belief, at least, from looking at what Quadrex was saying was that in them not finding some things that they expected to find, they were suggesting one methodology for achieving and quickly getting to some of the things that they found, that they found wanting in their own opinion. And they proposed that the formation of a systems engineering function as a separate organization, if you will, at least that's the implication I read from Quadrex, was one appropriate method.

It's my own experience that that is one way of doing that particular activity; it is not the one that I am most used to seeing. And I have seen many projects completed utilizing these very same kinds of documents and these very kind of review and comment processes and

disciplinary coordination processes as a means to achieve that interdisciplinary coordination.

And one further comment if I might, the review and comment process, in particular the interdisciplinary coordination, design review procedures and review and comment process, the system design assurance procedures and all those kinds of things, had within them, I felt, the essential elements of accomplishing the very things that Quadrex was suggesting needed to be accomplished.

The only concern that I saw personally relative to that process was that I had concerns, I think, which I share with Quadrex, whether or not that process was going to be timely in accomplishing those necessary activities.

So I don't wish to characterize that we did not agree with Quadrex, or at least that I didn't agree with Quadrex, that these were not significant issues, significant timing concerns, significant concerns relative to the completion activities for the project; only that we did not necessarily agree that the approach that they selected was the one and only or for that matter even the preferred matter for accomplishing that.

Q Now I'm a little puzzled. You're talking as if you actually observed Brown & Root performing review and comment process. Were you at the project while Brown & Root was still on the project?

A (By Mr. Lopez) Let me answer. You've asked two questions. The first -- the answer to your last question first. I was on the project when Brown & Root was still on the project. That was in the transition period. Some of those elements probably were going on.

To answer your first question, I did not -- I did not perform any audits, I did not personally go to Brown & Root and walk through their process. I'm strictly relying upon the procedures and the evidence of those activities going on for the judgments that I've reached.

Q The evidence that they were going on.

A Right. And my comments really relate to my view of the process, of course, as a timely process.

Q Let me back up and ask you. In the preparation of this testimony, did you, Bechtel, put together a team of people to do this or did the two of you, are you the only two that worked on this or --

A The direct testimony?

Q Yes.

A (By Dr. Bernsen) It's ours.

Q The two of you put this together?

A We did rely, of course, on some of the back-up you see for let's say technical guidances on issues that we're not as familiar with, but this was all existing

documentation.

A (By Mr. Lopez) I would further add that I did discuss some specific questions with personnel on the project that I was aware had participated in either some of the EN-619 preparation and/or some specific transition activities as an aid in directing my attention to particularly the documents that existed, you know, in the time frame prior to May of '81.

Q When you say "personnel on the project," Bechtel personnel --

A Yes.

Q -- now on the project?

A Yes.

Q Or at least when they were preparing this, they were on the project?

A Yes.

Q Now, going back to what I was talking about a minute ago, maybe I have a better example. On page 25, there's question 30. And on page 26 is the answer.

JUDGE LAMB: What were those page numbers, Mr. Sinkin?

MR. SINKIN: 25 and 26.

Q (By Mr. Sinkin) Let me just be sure I understand the wording of your answer. The sentence starting "additionally," you refer to the sentence quoted

on the previous page by CCANP from the Quadrex report. And you say -- excuse me, this sentence appears to relate to Quadrex's concern that there was not a single set of multi-disciplinary design criteria applicable to all disciplines, and that each discipline was establishing design criteria applicable to the work it was doing.

Is the "and that" a second concern you perceived Quadrex had? In other words, there was one concern that there was not a single set of multi-disciplinary criteria and the second concern that each discipline was establishing its own criteria?

A (By Dr. Bernsen) We collectively agree that they're two separate but related observations, one that in the sense they're recommendation that it sure would help to integrate things if you had one single set.

And two, that they were concerned that each discipline was establishing criteria applicable to its own work.

A (By Mr. Lopez) Further to that. The specific discussion in Quadrex, at Page 3-2, where, if you will, we've paraphrased some of the concern, again by talking about internal consistency, gives an example of, for separation schemes; and then says this guidance in the form of a TRD does not exist, consequently each discipline now provides their own interpretation.

So they were building, if you will, on a logic trail that said in their view, the non-existence of what they viewed as multi-disciplinary design guidance had the consequence that the disciplines, you know, were developing their own.

Q And their concern was that the disciplines in developing their own were not doing that adequately to address the particular criteria such as separation or whatever? Is that how you perceived Quadrex?

A The way I perceived them in the total thought process was that by having them do it independently, there might not be -- they use the term "consistency," and I believe, in my own judgment, that what they were getting at was compatability as opposed to consistency.

As we point out in our testimony, different groups may not use the same assumptions, if you will, because the work they're doing may not depend upon them having the same information. There's a need for the final design product however to be compatable.

And so in that sense, I think their concern was that they might not be that compatable.

Q One of the documents that Quadrex sought was a top level document on failure modes and affects analysis. Is that correct?

A (By Mr. Lopez) That's correct.

A (By Dr. Bernsen) That's correct.

Q And are you aware of the instance where Quadrex asked for separate disciplines to provide them with a list of what was being treated under the failure mode and affects analysis and none of the disciplines could give them a list?

A (By Mr. Lopez) I'm aware of the testimony by Mr. Stanley that they asked for that information and did not receive it. I am also aware of the language in the Quadrex report that restates that in written language.

I'm not aware that it was based upon their inability to do so, only where the statements of fact by Mr. Stanley in Quadrex that they did not receive them.

Q I guess what I'm looking at is what I see in Quadrex is that happens and they say somebody's got to tell these disciplines that this is how you do this. So they do it, so let's create this document up here that says here's how we shall go forth and do it and then maybe next time we come ask the disciplines they'll say "Oh, okay, here it is."

MR. FRANTZ: I'm not sure that question has any foundation in the Quadrex report.

A (By Dr. Bernsen) Was there a question?

Q (By Mr. Sinkin) I'll be happy to hear your response to that.

MR. FRANTZ: There's an objection on the floor.

MR. SINKIN: Oh, there's an objection in that you don't think I've accurately --

MR. FRANTZ: I don't see any foundation in the Quadrex report for some of the statements you made in that question.

Q (By Mr. Sinkin) Well, we established that Quadrex had recommended a top level document for FMEA, right?

A (By Mr. Lopez) That's correct.

Q And that they had gone to four disciplines and asked for their FMEA list and not received it for whatever reason.

A (By Dr. Bernsen) Yes.

Q Is that your understanding of what happened?

A (By Mr. Lopez) I think they asked for their single failure --

A (By Dr. Bernsen) Single failure --

A (By Mr. Lopez) As I recall.

A (By Dr. Bernsen) Maybe we should look at that. Do you recall where that is in the --

Q Actually it's both; they asked them for FMEA and the postulated single failure list and didn't get either one. I guess I'm linking those two events in my mind as cause and effects. They go to the disciplines,

they don't get the documents, and therefore they call for the top level document. Do you perceive it that way or do you perceive it differently?

A (By Dr. Bernsen) I can give you my perception. Frank may have his own and this is somewhat an observation based on Mr. Stanley's testimony. He kind of described an ideal world, where things like this would be done by each of the disciplines at the working level as the designs of the systems are produced, and that's certainly is, in fact, the most efficient way that one could think of to have engineering done. But in the real world, you find that a lot of these things are specialized and in fact you need special groups or specific individuals on the project who are more competent to perform these functions, and in fact you may do them later on in the design process. It's the iterative process, you make some designs and then you have them reviewed.

Now, it was our understanding that one of the responsibilities of this systems assurance group was to either perform or review this type of analysis. And it's also indicated, I'm not sure in our testimony or the Bechtel task force, that we didn't -- we don't feel that a top level document of this nature is essential for qualified people, competent experienced people, to

perform these functions.

Now, I think this what's -- say your characterization of what Mr. Stanley was thinking is that if the groups are supposed to do this and he wasn't sure who was, and if they didn't seem to have any tools for doing it, then it sure would be a good idea to give them tools before they began the task.

Q (By Mr. Sinkin) And you talked about something that could be done without a top level document by qualified, experienced, well-trained engineers. Is part of what we're seeing here Quadrex doesn't find a great depth or breadth in the Brown & Root engineering program and feels that maybe more top down kind of direction is needed to a younger, inexperienced, not as qualified group?

A (By Mr. Lopez) I don't think I would go that far. I would like to comment as to and I believe we do in our direct testimony, if I recall correctly, that although they were not provided with a, if you will, a single failure list, whatever that term is intended to mean, there were failure modes and affects analysis in the form of single failure analyses represented in the TSAR.

In addition, the system design descriptions for the various systems including particularly the safety

related systems, indicated the single failures and, you know, the necessity for looking at single failure criteria and looking at various abnormal events and various kinds of casualty events as the terminology was used in Brown & Root, that needed to be addressed.

So there were, in fact, single failure considerations in the design as reflected in the system design descriptions and as reflected in information provided in the FSAR.

What one of the things that apparently Quadrex was after was that in the evolution of regulatory practice, the NRC was asking for more sophisticated analyses than was typical of what was in the FSAR at that time.

Brown & Root apparently was aware of that but had not begun those more sophisticated analyses yet. So there was no, if you will, at least that I'm not aware of a failure modes and affects analysis list above and beyond the single failure work that had been done previously.

MR. FRANTZ: Mr. Sinkin, have we reached a good stopping point, a good time for a break?

MR. SINKIN: Yes.

(Recess.)

JUDGE BECHHOEFER: Back on the record. Before

Mr. Sinkin resumes, we have one or -- or I have one question I want to ask. I think Dr. Bernsen is the appropriate person to ask.

Yesterday Mr. Stanley testified that during his consultation with the task force, at the time, I believe, in November, I think it was November '81, he prepared a list which correlated generic findings with the questions and answers in Volumes II and III of the Quadrex report which related to those generic findings.

Are you familiar with that list?

DR. BERNSEN: No, I'm not.

JUDGE BECHHOEFER: He said it was basically a handwritten list which he provided to Bechtel.

DR. BERNSEN: I'm not aware of that.

JUDGE BECHHOEFER: I was going to ask you if you had it, to bring it, to let us look at it and help us, but you don't, so be it.

DR. BERNSEN: It would be useful. I'm not aware of it.

JUDGE BECHHOEFER: Okay. Back to you.

Q (By Mr. Sinkin) When you sat down to prepare your testimony, did you create your own list of discipline findings that you thought were represented in a generic finding?

A (By Mr. Lopez) Well, are you talking about

developed a, if you will, a cross reference list?

Q A cross reference.

A I didn't prepare any such list. Now, by the time I was advised that, you know, I would be requested to, you know, potentially testify in this hearing, I had identified to me the specific generic findings and specific discipline findings that would be, you know, the subject of the testimony.

I looked at those and attempted -- in the case of the discipline findings, it was reasonably straightforward because there was a relatively simple statement of, you know, their judgments, and then typically one or more references to questions. So that was relatively straightforward.

In the case of the generics, what I attempted to do was to go down and look at the key -- what I thought were the key summary statements and try to determine whether or not there was a tie that I was aware of. And in most cases what I found was that the language that was used in the summary was almost a direct paraphrase of language that existed in certain discipline findings. And particularly where there were citations to questions, you know, there was, if you will, a trail going through the questions to try to -- to try to get at it that way.

I didn't prepare any specific list. As I went down, I tried to highlight to myself that that appeared to be discipline finding number so-and-so, question number so-and-so, and I intended as much as possible to rely on the questions rather than the findings, other than the fact that I used the discipline findings as an added assurance that I was really capturing right the same thought.

So I guess the direct answer to your question, I didn't prepare any separate list, you know, for that purpose.

Q You may have answered it, but there's one extra step that I'm not sure if you took or not, of taking a generic and then just running with it through all the discipline findings and seeing how many of them you thought supported that generic; did you do that process?

A (By Mr. Lopez) No, I did not. What I was alluding to was that I went through the language of the generic finding to try to capture, if you will, independent thoughts and then based upon my prior knowledge of the Quadrex report, try to determine where that was. You know, in some cases, it was, you know, it was relatively clear trail, they were talking about nuclear related analysis, I know where to look, because there was a complete section and a whole section of

questions in that area.

Where the statements were more broad, that wasn't always easy to do and sometimes I just had to -- he just had to sort of rifle through and try to find the equivalent language.

Q Okay. Turning to page 18, question 23, and answer 23, your answer says that Quadrex did identify significant deficiencies in design related to B&R's systems integrations and overview function and systems engineering function.

And first of all, you say the deficiencies were limited to those reported to the NRC. By your answer, do you mean those reported on May 8th, 1981, or are you including those that were subsequently reported after May 8th?

A (By Mr. Lopez) Let me make sure I'm with you. You're talking about our response to the top of at Page 19.

Q Right, to the question at the bottom of page 18.

A (By Dr. Bernsen) My answer to this is that had in mind the specific items reported to the commission in May, essentially the HVAC area, and perhaps computer code verification.

A (By Mr. Lopez) That was also my feeling, those

two were the ones where I thought there might be some relationship; more directly the one on HVAC.

Q Some relationship to the 3.1(a) generic finding on systems integration.

A (By Dr. Bernsen) Yes.

A (By Mr. Lopez) Yes.

Q Fine. In question 24, answer 24, you refer to a B&R procedure which required systems design assurance group to perform certain reviews. Had that procedure been implemented as of May 8th 1981?

A Yes, the version that I looked at had been.

Q And the version you looked at was the May 1981 version? I mean not that it would say May 1981 on it, but it was the version in place in May 1981?

A Yes.

Q And do you know if the Houston review team was aware of that procedure on May 8, 1981?

A May I see the Applicants' exhibit relative to the Brown & Root --

Yes, I think that in looking at the Brown & Root review sheets that were used apparently on May 8th for some of these reviews, I found references to design assurance group. I don't recall whether or not and I'd have to look through the entire list to determine whether or not there was a reference to the procedure per se -- a --

Counsel has pointed out to me that line item No. 4641(a) does specifically reference the A005 procedure.

Q What was that line item? Oh, I'm sorry.

A It was in the 46 series.

Its 4641(a) and also turns out 4641(c), both reference the procedure.

MR. SINKIN: Thank you.

Q (By Mr. Sinkin) In your answer to question 25, again it's a rather lengthy answer so let me give you a moment to familiarize yourself with it.

A (By Mr. Lopez) Okay.

Q In your answer, you seem to say that the only concern that Quadrex had in the area of deficiencies in design related to separation or the single failure criteria was the common instrument air line that we looked at earlier this afternoon. Am I reading your testimony correctly?

A I think at the bottom of page 20, the beginning of Page 21, we do indicate that relative to deficiencies in design related to separation or single failure criteria, it was our belief that Quadrex was identifying that common instrument air line problem as the primary example of that problem.

Q Your statement is: Quadrex did not identify any concerns in this regard with the exception of that

one. Seems to be saying that that's the only concern Quadrex had in this regard.

A (By Dr. Bernsen) Perhaps it's important to recognize the emphasis on our testimony is toward the question of significant breakdown and things of the nature that could be reportable. It's difficult, of course, to avoid making judgments or overlooking things that relate to efficient and effective ways of doing engineering, recommended good practices.

Now, it's my view that Quadrex had some observations on ways that Brown & Root could improve the process. And that -- we really were not addressing that as the -- the absence of that as a significant deficiency or breakdown in the QA program, that would be considered reportable.

So what we're really saying here is looking over the Quadrex report, we only find that one particular item.

Q Let me ask you to look at question E-15, the first paragraph in the Quadrex assessment. I'm referring at this point particularly to the first paragraph of the Quadrex assessment.

A (By Mr. Lopez) Of the assessment --

A (By Dr. Bernsen) Oh, okay.

(No hiatus.)

Q I guess it's a long question.

As I read that question, Quadrex asked Brown & Root to respond to various criteria and Brown & Root responded on the separation criteria by its position that it had recommended HL&P specify Class 1-E devices. And that's all right in Quadrex' view that they did that, but that's not sufficient to achieve separation.

And the concern I see expressed by Quadrex is that if Brown & Root was assuming someone else was going to do work and that's why they didn't cover all aspects of separation, then you would have a potential interface problem that could be serious.

MR. FRANTZ: Mr. Chairman, the document speaks for itself. I'm not sure why Mr. Sinkin has to go through and characterize what's written here.

MR. SINKIN: All right.

Q (By Mr. Sinkin) Is separation a safety-related concern, Dr. Bernsen?

A (By Dr. Bernsen) Separation is a safety-related requirement for safety-related systems.

Q And if a system does not adequately address separation, then has the system adequately met the needs of being a safety-related system?

A Well, you're asking sort of a generic question. We're not talking about this specific, right?

Q We'll tie it to this in a minute.

A If the system doesn't satisfy separation or alternative criteria.

Q By alternative criteria, you mean criteria other than separation?

A There are alternative ways of satisfying single failure and separation criteria. This is not necessarily a black and white thing. The important thing is to be able to show that a postulated event will not prevent the capability to safely shut down the plant using safety-related systems. It may be that this capability is achieved by some alternative system so that there are instances where separation is not absolutely required.

Q Turning to question E-15, that paragraph. Apparently the question asked is for Brown & Root to describe how interaction, single failure criteria and separation are achieved for turbine trip causing reactor trip and reactor trip causing a turbine trip.

MR. FRANTZ: Is there a question?

A (By Mr. Lopez) Is there a question?

Q (By Mr. Sinkin) As I read this, this is an instance where Brown & Root was not adequately demonstrating to Quadrex that they were achieving separation. Is that how you read it?

A (By Dr. Bernsen) Yeah. The concern they state is that B&R did not cover this aspect in their response period.

Q Actually it's a comma.

A Oh, sorry, comma.

Q And may be assuming that others are doing it?

A Well, that's a presumption. I mean, I think the statement of more or less fact is that they didn't cover something in their response.

Q Well, Quadrex in general in their report when they don't get a response give that fact a meaning; is that not correct? They interpret the fact that they don't get a response?

A That's one of the problems with the report, yes.

Q And why do you say that's a problem with the report?

A Because they're drawing conclusions without support.

Q It seems like a Catch 22 to me. If you go to a discipline and you say show me how you achieve separation and they don't provide you enough information to show you that they can achieve it, are you then to assume that they can but they just can't show it?

A Well --

MR. PIRFO: I will object to that because I think it's about as close to being argumentative as it can be without being actually argumentative. He said it real nicely, but he's still arguing with the witness.

MR. SINKIN: I'm really trying to clarify what the witness is telling me in terms of you go to a discipline, you ask for something, they don't deliver it.

Q (By Mr. Sinkin) If you went to a discipline and you asked them to show you how they achieved separation and they came back and said here's how we do it and what they showed you only achieved part of it --

JUDGE BECHHOEFER: I think we'll overrule the objection.

MR. SINKIN: Okay.

MR. AXELRAD: What's the question?

A (By Dr. Bernsen) Well, now --

MR. FRANTZ: Excuse me. What is the question, Mr. Sinkin?

MR. PIRFO: That was my problem. Not so much the way he said it, I didn't hear a question in there. That's the reason for my objection, but it's been overruled. Maybe we can --

MR. SINKIN: Maybe we can try again?

JUDGE BECHHOEFER: Do you want the reporter to

do it?

MR. SINKIN: I wouldn't mind, if the reporter doesn't mind.

(The preceding question was read back by the Reporter.)

Q (By Mr. Sinkin) What would you think -- would you think that something was wrong? Let's try starting there?

A (By Dr. Bernsen) Okay, let me put my QA hat on.

Q Please.

A The first thing I would do is find out what the concern was and carry that back to the discipline and say, hey, we notice in your response that you didn't address the subject, is this a problem. And through an iterative process, I would find out whether or not I understood what they were doing, whether what they were doing was adequate and met requirements or not. And until I finished that transaction, I wouldn't call it a finding.

The only part of this that's a finding is the statement that they didn't give them a complete response. I can't draw any conclusion from that. Perhaps the question wasn't clear.

Q Well, we have the question in the Quadrex

report in this particular E-15. It's on the first page of the E-15 documentation. The third area of example is what they asked them to produce and in response -- they responded by saying they recommend HL&P specify Class 1-E devices.

MR. FRANTZ: I still haven't heard a question.

MR. SINKIN: He was talking with the other witness. I was just giving him a chance to catch up.

A (By Mr. Lopez) It might be worthwhile --

A (By Dr. Bernsen) I think it might be worthwhile for Frank to clarify it because I think that we don't have the same concern.

Q (By Mr. Sinkin) Fine.

A (By Mr. Lopez) The issue that Quadrex was addressing, at least particularly with regard to the two line items in the question itself, turbine trip causing reactor trip, reactor trip causing a turbine trip or main generator trip, which is essentially equivalent, was an issue that the NRC had been identifying as a specific question on numerous projects in and about this time frame.

The concern is this: The turbine generator system of the plant is non-safety-related and by design, and at least in all the applications I've ever seen, is

so designated. It's also in common practice located in a non-seismic Category 1 building. The turbine generator buildings of most plants that I'm aware of have typically not been seismically analyzed, the primary rationale behind that being since there is no safety-related equipment in that building, the building need not be considered safety-related and seismically qualified.

The scenarios for how the reactor will shut down in the event of various kinds of transients have always accounted for and included the consideration that one of the sources for a reactor tripping might, in fact, be that the source of the problem, if you were, that caused the reactor to trip would be the turbine tripping itself. The design for most projects has always accounted for that primarily on the basis that the process conditions in the event the turbine should trip will lead to the reactor tripping just as a function of, if you will, the reaction of the secondary system to that turbine trip. The loss of the turbine, initiation of auxiliary feedwater, those kinds of things would lead to a condition that would eventually cause the reactor to trip on its own and by design to safely shut down.

The concern that the NRC was raising was that

here was an instance where it might be appropriate to consider what they call an anticipatory trip, to not wait for the conditions of the plant shutting itself down, if you will, to react, but to install some sort of devices on the turbine generator that would send a signal, if you will, immediately or, you know, not immediately, that's too severe, within the time response of instrumentation to cause the reactor to trip and begin that orderly shut down of the reactor in anticipation of those conditions rather than letting those conditions arise.

Now, there's a difficulty with that which the NRC recognized and that is that if you're going to put, quote, safety-related actuation devices in a non-seismic Category 1 non-safety-related building attaching it to non-safety-related non-seismically qualified devices like the turbine generator, there's going to be some difficulty in being able to, quote, in full pedigree call that a safety-related actuation system. And what they have recognized and having recognized that as a problem, they have adopted on numerous projects the concept that licensees should include such instrumentation and that, if you will, the normal pedigree for safety-related devices would be waived in lieu of somehow attempting to, if you will, upgrade the

whole turbine generator building to a seismic Category 1 building.

They felt that the benefit to be derived from having this anticipatory trip, even though the plant can safely shut down without it, outweighed any argument that might be made against it being extremely, you know, or not cost effective to accomplish that. So, they, in essence, established rulings. I think the specific instance where it was dealt with in their safety evaluation report for the first time that I recall was the Byron-Braidwood Project and it's been applied in numerous other instances since then.

So, the issue that Quadrex was getting at was, in essence, are you aware of this concern, have you started looking at whether or not you ought to have, quote, and I'm putting quotes, safety-related instrumentation. And the way that most plants have attempted to do that is to provide 1-E electrical power, that is reliable, typically diesel generator backed power supplies to that instrumentation so that you might be able to implement this anticipatory trip.

It's apparently Quadrex' concern, one, to identify whether or not this was recognized. It apparently was recognized. The recommendation had been made by Brown & Root to install Class 1-E devices. This

decision at that time frame was still premature. There was no design. As a matter of fact, my recollection was at the time we, in fact, started receiving transition documents from Brown & Root, that design had not yet proceeded beyond, you know, the agreement that it was something that needed to be added to the design. So, they had not dealt with the physical layout of how that was to be accomplished.

Another thing I should add, that in agreeing, if you will, to waive some of the aspects, primarily the seismic qualification, seismic support aspects for that, the NRC has directed licensees to, if you will, make a best effort to make those devices as safety-related as is reasonable without their qualification as, if you will, seismic Category 1 devices. Provide 1-E power, provide protection from hazards like missiles, and provide separation where that's appropriate.

The specific instance here is that the decision was just being made to add it. I don't think at this point -- I'm certain at this point there was no physical layout yet. Clearly separation would have been one of the things that I would believe the NRC would have expected to see in the final layout of these devices, you know, once an agreement was reached to put them in place.

One further comment. The other item relative to turbine trip based upon a reactor trip the NRC has not required to be safety-related. That does not have the same anticipatory aspects to it that the other does. So, the only one where there was an NRC interest, if you will, in upgrading to safety-related this circuitry, was the circuitry that would have caused an anticipatory trip of the reactor based upon some indication that the turbine was tripping. The other was not considered to be safety-related, although some licensees have, you know, gone ahead and, once again, provided 1-E power to those devices, it wasn't considered to be safety-related, nor do I believe the NRC has forced anyone to make that safety-related application.

JUDGE BECHHOEFER: Mr. Lopez, is this one of the areas where the NRC staff has designated the component or the structure as important to safety and is trying to apply Appendix A rather than B criteria?

MR. LOPEZ: I'm not -- I don't ever recall this particular item having specifically been identified as one of the items, you know, at issue in some of these industry discussions with the NRC as important to safety. It clearly falls into the generic description, though, in my mind of those kinds of situations.

What they were looking at in those instances were, if you will, failures of non-safety-related equipment or events of, you know, of non-safety-related failures having some potential impact on safety and, therefore, the NRC was looking at whether or not additional quality assurance requirements that would not normally apply under Appendix B should be applied to that particular design, that particular component.

I think it's consistent, but I don't personally recall that in the list of things that they were talking about, that reactor trip circuitry might have been.

Although, do you recall in the --

DR. BERNSEN: No, I don't recall any specific. I guess in terms of the -- in the generic sense, it probably would be one of those items.

JUDGE BECHHOEFER: Thank you.

Q (By Mr. Sinkin) Turn, if you will, to question H-6.

A (By Mr. Lopez) H-6?

Q H-6. The Quadrex assessment.

As I read this, we do have Quadrex here expressing a concern about separation in the first paragraph.

A (By Dr. Bernsen) As I read it, it's quite

consistent with their generic concern.

Q That would be 3.1(e), I believe.

A On separation.

Q Well, maybe not.

A Yeah.

Q You're saying yes to what?

A Yes, (e).

Q 3.1(e).

What I'm focusing on is the word "was" in the second sentence, the responsibility to determine the adequacy of separation was shared by reviewers. This suggests to me that this was a task that had been completed in this instance as opposed to something yet to be done. Is that your understanding of the state of the design for physical separation of HVAC components on May 8th, 1981?

A (By Mr. Lopez) Let me address it this way: The South Texas Project from its -- apparently from its early inception, as I can determine from the PSAR, has embraced the concept of physical separation to a greater extent than most plants I'm used to having seen. That is, rather than relying upon, if you will, reviews to be performed after physical layout has been performed and then determining whether or not there are needs to add additional physical barriers, or in the case of fire

fire wrapping or in the case of missiles, you know, missile protection, those kinds of things, rather than rely upon them, they very early on adopted the philosophy of trying to physically separate in different areas behind various kinds of barriers that account for physical separation types of considerations into the base design. And my view of the work that was accomplished to date relative to separation was relative to that.

On the other hand, the specific review of separation and fire hazards and other types of physical interactions or systems interactions that occur as hazards and is the hazards analysis that is performed had not yet been performed. I think there's other discussion within Quadrex about the fact that some of that hazards analysis was just beginning.

So, I think it's consistent for them to say that there had been some separation work done; that is, trying to locate safety-related components as far away from each other or separated by physical barriers to the extent that once a detailed hazards analysis was performed, the likely finding of unacceptable locations, if you will, would be lessened.

So, yes, they had already begun some separation work. Detailed separation analyses relative

to hazards. There was, you know, various levels of work begun, but very little complete. A lot yet to be done.

Q Well, you have tied together the first paragraph and the second paragraph in the Quadrex assessment. As I read the first paragraph, Quadrex fully expected to find the criteria for physical separation to protect against postulated fires and high energy line breaks. But what you're saying is the second paragraph says that that work hadn't been done or had not been incorporated?

A I'm not reading that second sentence to say that. That was my own statement of, you know, based upon my knowledge plus other things in the Quadrex report relative to their questions about the timing, the timeliness, if you will, of some of those hazards evaluations having been performed.

Q I guess the thing that's puzzling to me is when you read the first paragraph, they very clearly state that someone had the responsibility to do this and when they looked for it, it wasn't there.

A (By Dr. Bernsen) I don't read it that way.

Q You don't read it that way?

A No.

Q The "was" doesn't mean to you the responsibility to determine the adequacy of separation

was shared by --

A Well, first of all, I don't see anything particularly wrong with that, so I don't consider it a deficiency.

Q With the absence of the criteria, you don't see anything wrong?

A No, the assignment of that responsibility to the people -- well, no, determining the adequacy, sorry, assuring the adequacy to the reviewers.

Q Do you see anything wrong -- as I read the paragraph, Quadrex is saying that there were reviewers who had a certain responsibility and that's fine that they have that responsibility, we're not criticizing that. But they did not fulfill that responsibility because when Quadrex looked for the written criteria for physical separation, it wasn't there.

A Okay, that's --

MR. FRANTZ: There's no question.

Q (By Mr. Sinkin) Is that how you understand what you're reading there?

A (By Dr. Bernsen) That's not how I understand it because you're assuming that in order for reviewers to perform this function, there would have to be some written criteria. In fact, there were commitments in their FSAR to provide separation to meet the regulatory

requirements. The reviewers can perform the review relying on that and their knowledge of these requirements. It isn't essential that they have a cookbook to use in performing that function.

In other words, you don't have to have this written specific criteria essentially. It may be good practice and desirable, but it ain't essential to have the criteria in order to perform the review.

Q Do you know if this criteria was in the FSAR in May of 1981?

A (By Mr. Lopez) Commitments for physical separation for safety-related equipment against fires and high energy line breaks was. I'm not sure which -- you know, there was no -- no, I should say there were descriptions of certain separation criteria such as electrical separation to meet both Reg Guide 1.75 type criteria which -- some of which had been embodied and expanded upon relative to fire protection.

There were criteria relative to the idea of high energy line break postulated rupture analysis and the methodologies that are used to prevent against unacceptable consequences of those things, including reference to separation as one means of accomplishing that. Similar references relative to fire protection, missile protection, other types of hazards.

So, in that sense, yes, there were commitments in the FSAR to provide adequate separation between safety-related components and as well away from unacceptable hazards from non-safety-related components, you know, for the plant.

I think the way I view this sentence that you're particularly addressing was that at the time that these reviewers, and I'm assuming when they're saying reviewers they're talking about reviewers of design documents that may reflect the system routing and the layout of the plant, that amongst the things that they would be looking for, as I previously stated, was to try to preclude a large number of unacceptable interactions resulting from such things as later analyses to be performed for fire hazards, later analyses to be performed for pipe break. And the way to do that in the review is to assure that physical separation is maintained wherever possible.

So, the commitment was made very early on by this project to use physical separation. It turns out that physical separation typically by concrete barriers, if you will, is usually the best way, once you're facing that consideration of these hazards, to solve the problem. Not all projects commit to do it by putting in concrete barriers. Many of them simply say I recognize

I have to address that hazard, I lay out the plant as best I can hopefully trying to keep things as separated as I can. And then I go through the analysis and if I find unacceptable hazards because I put things too close to each other and I have not put some interposing barrier between them, then I may have further work to do.

I may have to -- I may be able to do a so-called facility response analysis and demonstrate that it's really acceptable and there is no effect on safe shut down. I may have to put in barriers. I may have to reroute some of the equipment.

So, it's kind of a risky business. The South Texas Project attempted to try to resolve as many of those in advance by designing in physical barriers so that when they did the analyses, you know, the question is asked can a missile from this component strike its counterpart in another safety-related -- you know, the other train of that safety-related system. If the answer is no because there's a physical concrete wall between them, it makes that analysis very easy. If, on the other hand, they're side by side, you have more work to do, maybe an analysis to say that it really wouldn't hurt it or maybe an analysis to say that it really wouldn't affect safe shut down.

So, I guess the point I'm making is that it was the responsibility of the people responsible for system routing and for layout, the physical layout of the systems to try to achieve as much of that as they possibly could within the reason of, you know, living within the constraints, if you will, of the physical boundaries of the buildings and the structures they were working with. So, I don't think there's anything inconsistent with that.

Q But if there was no criteria, no written criteria for how to achieve that physical separation to protect against postulated fires and high energy line breaks and you were the reviewer, would you feel there was a problem in that you don't have a criteria to even evaluate the drawing with?

MR. FRANTZ: Asked and answered, Mr. Chairman, of Mr. Bernsen about two or three questions ago. Mr. Sinkin has been trying to get the witnesses to agree with this particular interpretation of this assessment. They have not. I'm not sure why he keeps persisting.

JUDGE SHON: You know, it seems to me that we're simply fighting over possibly a sloppy sequence of tenses in two verbs in two sentences. If it said there were no written STP criteria for physical separation and the responsibility to determine the adequacy of

separation was shared by the reviewers, I think we'd have essentially the interpretation that the witnesses have been giving.

Isn't that what you were saying?

MR. LOPEZ: That's the way I'm reading it. Now, I maybe mischaracterizing it.

JUDGE SHON: If both of these words were in the present tense, everything would be fine. But someone wrote a little sloppy and I think it's tied a lot to the logic.

We've spent an awful lot of time on this I think, don't you?

JUDGE LAMB: Yes.

JUDGE SHON: I think the question has been asked and answered myself.

JUDGE BECHHOEFER: I think so, too. I think we'll sustain the objection.

Mr. Lopez or Dr. Bernsen, either one, is there anything wrong with the sharing of responsibility that's referenced here, the fact that more than one person or group has it? Either of you can answer it.

DR. BERNSEN: From what perspective? I think -- it's usually good practice to have single responsibilities. Unfortunately, in the real world you frequently find that that isn't always practical or

possible, and, so, you sometimes have to divide responsibilities.

JUDGE BECHHOEFER: I was referring to the particular sharing referenced here.

MR. LOPEZ: I think to amplify what Dr. Bernsen has said, you know, it's, wherever practical, best to assign specific responsibilities to specific individuals to assure that they don't assume the other fellow's going to do it. But more than one discipline, more than one group, more than one individual will be reviewing these layout drawings.

I would expect that, as an example, a licensing group reviewing drawings and recognizing that coming downstream are some hazards analyses that are going to have to deal with some of these tough issues and you're likely to try to want to avoid any hardware modifications necessary to make the plant, you know, safe and presumably licensable, that one of the things that they would say is if they saw something that looked like it could be a problem, to recommend during their review that physical separation be provided, assuming it was a practical thing to do.

But, you know, I would share Dr. Bernsen's opinion that, you know, sharing in itself is not a problem as long as it doesn't dilute responsibility as a

result.

DR. BERNSEN: Yeah. And to point out further the ambiguity of that sentence, I don't know whether the sharing is between the doer and the reviewer, the sharing is between the reviewer of routing and the reviewer of layout drawings were different or the multiple reviewers of all the drawings.

So, it's not at all clear what the concern is here. And we find that, in fact, you've got to have multiple groups of people with different viewpoints looking at things to make sure all these requirements are, in fact, incorporated.

Q (By Mr. Sinkin) Looking at your question 26 and answer 26. Were the procedures identified in answer 26 provided to Quadrex during its study in 1981?

A (By Mr. Lopez) I don't know for these three procedures. I'd have to go back and check.

Q Was it not true that Quadrex did not primarily look at procedures? Weren't they looking at actual design output documents?

A (By Dr. Bernsen) That's what they stated.

A (By Mr. Lopez) With the exception of some particular ones, I think they referenced the design verification procedure and possibly I believe also the computer program procedure, you know, as something that

they were looking at in particular. The ALARA procedure, they reference that.

So, they were looking at some procedures, I just don't know whether or not these were ones that they specifically addressed.

Q When you looked at these --

JUDGE BECHHOEFER: On 005 you testified a couple pages back --

MR. LOPEZ: But that was Brown & Root in their May 8th response. He asked whether or not, I believe, whether or not Quadrex was given these to review.

JUDGE BECHHOEFER: Oh, I'm sorry.

MR. LOPEZ: And that I don't know.

Q (By Mr. Sinkin) And in your -- did you review each of these procedures?

A (By Mr. Lopez) Yes, I did.

Q And were you reviewing the 1981 version?

A I was reviewing the procedures that were in place in the May '81 time frame, yes.

Q And do you have any knowledge as to whether those procedures were being effectively implemented in May of 1981 by Brown & Root?

A Well, once again, I think, as I testified earlier, I made no -- participated in no audits, made no formal review in the sense of going over and reviewing

that in place. I reviewed the procedures to see whether or not, particularly with regard to the questions that were being asked relative to quality assurance implementation, whether or not I felt it met those essential elements. I reviewed and was aware of documents showing evidence of the fact that these reviews were, in fact, being performed.

Q You state that Brown & Root had several procedures intended to control the interfaces that exist between the various organizations. Did HL&P have such procedures?

MR. FRANTZ: I object. That's outside the scope of this proceeding.

MR. SINKIN: Well, if it's outside the scope of this proceeding, why is it quoted on the previous page?

MR. FRANTZ: We discussed this very finding a day or two ago and --

MR. SINKIN: I think the objection was erroneously sustained at that time because I had forgotten that this was indeed quoted as a finding in this review.

MR. FRANTZ: It's undisputed that Quadrex did not review HL&P's design activities. There was a review of the Brown & Root activities. This appears to be an

offhand statement at best.

(No hiatus.)

MR. SINKIN: I've seen at least two Quadrex observations, one was that Brown & Root was not handling input data from HL&P very well, that was one relationship between the two of them. Now we have an actual Quadrex observation of HL&P's systems function, and it's here. I mean, it's in the contention, essentially.

A (By Mr. Lopez) Is there a question --

MR. SINKIN: There's an objection pending. I don't believe there was any parsing of the generic findings to which sentences were in and which sentences were out when they were identified by the Board. They were identified simply by their number. And finding 3.1(a) is one of the generic findings at issue and whether that should have been notified to the NRC.

JUDGE BECHHOEFER: We're going the overrule the objection. It is in Quadrex and it is in the testimony. I can't remember whether we ruled correctly or incorrectly before, but this one we'll let be answered.

MR. SINKIN: I'll repeat the question. It has been a while.

Q (By Mr. Sinkin) In your answer, you answered Brown & Root having several procedures intended to control the interface that is exist between various organizations. The question is: Did HL&P have similar procedures to control the interface between various

disciplines?

A (By Mr. Lopez) I don't know whether or not they had similar procedures. In responding, we took particular note of the fact that Quadrex stated that HL&P had indicated their close organizational structure with Brown & Root; we also were aware of that, that the Brown & Root procedures that I have noted in this response also include those HL&P reviews and comments that they would send, you know, as part of this process.

That would be done with those people that were a part of the HL&P engineering team assigned with the project. So we felt that that addressed the question that Quadrex seemed to be getting at.

Q You are saying that the Brown & Root procedure governed the activities of Houston Lighting & Power?

A No, I did not.

Q Okay.

A What I said was -- what I meant to say, if I didn't say it specifically, was that the Brown & Root procedures included requirements for review by HL&P as part of the activities covered by these procedures.

In other words, they would send to HL&P for review and comment as an example, a document that under their procedures required HL&P, if you will, concurrence prior to issuance, review and comment, those kinds of

things.

Q Do you know if HL&P had procedures for receiving and addressing those documents that would achieve systems integration?

A I do not know whether or not they had procedures. The only evidence that I'm aware of is that I had seen HL&P review and comment forms indicating that they were performing such reviews and putting their comments on a documented sheet of paper. But I never reviewed their procedures. And I don't even know if one existed at that time.

Q On page 23, your answer 27, the first line, criterion 3 of Appendix B, when criterion 3 requires that design interfaces be controlled, do you read that as having two components, one that there be a procedure for controlling and two that the procedure be effectively implemented?

A (By Mr. Bernsen) I think that it's the general intent of Appendix B that you have procedures and they be implemented.

Q Question 28, answer 28, why does it appear to you that when they made the statement quoted in question 28, Quadrex was seeking greater informal communication among the disciplines?

A (By Mr. Lopez) The language selected by

Quadrex indicating -- indicated to me the use of the terminology working interface relationship and routine follow through discipline input/output interface, indicated to me that Quadrex was seeking better communication; that's obviously a desirable goal in any situation.

The procedures that I alluded to in earlier questions were formal, written procedures with formal documentation, official forms, letters, and processes to assure, you know, both traceability and administrative controls and those kinds of things.

That's not, even when such a system exists, and, if you will, meets all the essential elements or maybe even goes beyond meeting the essential elements of the quality requirements for interface, it's not always the best way of doing business.

I would also agree that independent of how good one's formal lines of communication maybe, how defined they may be, how standardized they may be relative to the forms and methods and sequence, those kinds of things, a lot of work can be done and and a lot better information flow can occur when informal routine communications are addressed. And some of the discussions in the specific discipline findings or particularly in the question and response, there seemed to be some concern on the part of

Quadrex relative to whether or not enough of that communication seemed to be occurring. And for that reason, you know, I characterized that as being their suggestion that better means might be available to encourage more and better informal communications.

A (By Mr. Bernsen) I think to amplify that, that it seemed like the only logical way to interpret the comment, because there wasn't evidence that formal procedures weren't being followed or anything of that sort. There wasn't any questioning that they didn't see people who were supposed to perform functions. The people who were supposed to perform functions seemed to be performing them so that all we were really left with was that area of informal interaction that's nice to have, certainly, but it's below a level of a formal requirement.

Q Let me ask you to look at question C-1, Quadrex assessment, items A and B.

A (By Mr. Lopez) A and B, you say?

Q Yes.

Q Do you see those findings as perhaps related to question -- the notations in question 28? The quoted sentence in question 28?

A (By Mr. Lopez) Well, in one sense, I believe so. We discussed in our -- in another part of our

written testimony the question of this input/output interface question about whether or not -- you know, who has the responsibility, if you will, for a review of the use of data that's transferred from one organization to another and seeing to it that it's properly applied.

You know, in a formal sense, it's quite possible to rely upon informal procedures and review and comment. I think as we pointed out in our written testimony it's always desirable and we would certainly highly encourage any organization that has, one, qualified individuals who know the potential uses of their information, two, as best they can, help support the proper use of that.

It is very difficult to establish formal procedures that will always guarantee that because of the variabilities that exist in both experience level of individuals and as well as, you know, the varying applications that can be applied to input data.

So in a formal sense, it's very difficult to impose a requirement as an example, that one discipline be responsible for the correct use of its data always because they may not -- either may not have the right people with the right experience to know that; or secondly, they may not know all uses that are intended for it and it would be very difficult to accomplish that

by formal procedures.

So it's always a good idea to have informal communications where that's appropriate, given the experience of the people involved. So I think in that sense, it seems as if in particular in question C-1, Quadrex was getting at in those two items, that sort of discussion, if you will, an understanding by a supplying discipline of how the input that they're providing is going to be used by others.

Q Would it be difficult to achieve what Quadrex seeks in finding F in the same question?

A (By Mr. Lopez) Same question being C-1?

Q Yes, whether it would be difficult to achieve at least a receipt of really important data transmitted to a discipline acknowledging back the discipline that sent it that you had gotten it.

A What do you mean "would it be difficult to achieve that."

Q The discussion we just had, Mr. Lopez' testimony was that A and B are a bit difficult to achieve because it's hard to define, there's so much variability, that sometimes you send instructions, sometimes you don't send instructions, so setting up the procedure on when you sen them, when you don't is not easy. That was his testimony, if I'm correct.

A (By Mr. Lopez) That's essentially correct.

Q Simplification of your testimony. Whereas item F seems to be something fairly straight- forward that could be achieved.

A (By Mr. Bernsen) It is and could be -- it isn't -- within a single organization, it isn't normally considered necessary to be that formal. And in fact, this has been recognized in the QA standards, that the level of formality in the transmittal and acknowledgment of information can vary.

A (By Mr. Lopez) To further amplify that, it is different from what I was discussing earlier relative to the variablities, a mere acknowledgment is not a major issue that would vary much. But as Dr. Bernsen has pointed out, it's also not that common practice.

Q Staying in answer 28 for a moment, I think if you reference back, you'll see that we're still in 3.1(a), if I'm correct.

For example, question 26 is the closest reference to this question of a generic -- are you with me on that observation?

A (By Mr. Lopez) I'm trying --

JUDGE BECHHOEFER: You don't get the 3.1(b) until you get to page 29.

MR. SINKIN: That's right.

A (By Mr. Bernsen) Okay.

A (By Mr. Lopez) Yes.

Q Would it be correct that the second -- the third sentence of answer 28 is really 3.1(b) and not 3.1(a)?

MR. FRANTZ: Excuse me, Mr. Sinkin, I'm not sure what you mean is this really 3.1(b) rather than 3.1(a).

MR. SINKIN: A discipline supplying data to another discipline was not checking to see that the data were being properly used.

MR. FRANTZ: Are you saying that's also a concern of 3.1(a) or concern of 3.1(b).

Q (By Mr. Sinkin) Is that also a concern of 3.1(b) as well as 3.1(a).

A (By Mr. Lopez) I think that's fair, yes.

A (By Dr. Bernsen) Yes.

A (By Mr. Lopez) As was pointed out, there are a number of instances, particularly through the generics, a common thought, a common concern expressed, in more than one generic finding.

MR. FRANTZ: Mr. Chairman, if Mr. Sinkin has reached a break point, it might be helpful to take a break here.

MR. SINKIN: Sure.

JUDGE BECHHOEFER: A fairly short break, I guess.

(Recess.)

JUDGE BECHHOEFER: Okay, back on the record.

Q (By Mr. Sinkin) In question and answer 31, the last line of page 26, you state criterion 6 does not require the issuance of a particular type of design criteria. Does criterion of 6 require that there be a design criteria?

A (By Mr. Bernsen) Just to check. I think that the more appropriate reference, of course, to the issue or the concept of design criteria would be found in criterion 3.

But then, if you have controlled criteria, then 6 would cover it -- the process of control.

MR. SINKIN: Mr. Chairman, at this point in the testimony, we have what is at best an anomaly and I'll just tell what you the problem is and we can figure out what to do with it.

A paragraph has been taken from CCANP's motion of November 1981 that was not intended to actually be an example of the contention but was the context for the other two examples of the contention. And yet it has been taken -- there's three paragraphs in the actual contention, two of them are from different generic

findings than this one and what has happened is they've taken the first paragraph and said, "Does this violate a certain criteria?" when there was no intention in CCANP's part to even say that that paragraph demonstrated a violation, it set the context for the other two paragraphs.

So essentially, the question and answer 32 doesn't address anything that we ever meant to put into issue. I don't know what we could about that.

MR. FRANTZ: I can appreciate your concern, Mr. Sinkin. I think the testimony probably stands as it is and why don't you just ask any questions trying to connect up the sentences if you wish to do so.

MR. SINKIN: Okay.

Q (By Mr. Sinkin) You finish your response to 3.1(b) on page 29. My question is where in your testimony --

JUDGE BECHHOEFER: Mr. Sinkin, A or B.

MR. SINKIN: They finish B?

JUDGE LAMB: No.

JUDGE BECHHOEFER: They finish A?

MR. SINKIN: Finish A, begin B, excuse me.

Q (By Mr. Sinkin) You describe the concerns expressed in 3.1(b) in question and answer 35. And when I look at 3.1(b), see three different concerns that are

not expressed there and I want to just touch those with you and ask you to address them.

In section two, I'm sorry, in section three, while you have addressed the second sentence, the first sentence is saying that Brown & Root's review of vendor submitted reports is not consistent and that sometimes they are poorly done. Can you tell me where you have addressed that part of the generic, as to whether you find it potentially reportable or not?

A (By Mr. Bernsen) Perhaps while you're doing some research, I could give a general comment that the -- the specific sentence appears to be an observation, and nothing more.

It identifies no deficiency specifically or really any quality assurance or quality program deficiency that I could visualize. It's strictly an observation. One would have to get the follow-up information that says that as a result of the review, we found deficiencies in vendor submitted reports that had some safety significance. And that doesn't appear to be the case. So that it appears to be merely an observation which doesn't need to be addressed as a potential finding or anything of the sort.

Q Let me ask you to turn to question M-49, the Quadrex assessment, item three, where the conclusion of

Quadrex is that Brown & Root review of this vendor report was seriously deficient.

My question would be whether item F, item three in the Quadrex report, the assessment of M-49 represents to you a quality assurance problem?

A (By Mr. Lopez) Okay, I reviewed the various documents and I've got to admit I was reading when you were asking the question and I think I heard part of the question. Could you repeat it again, it was relative to whether or not we had considered M-49.

Q Whether M-49, the Quadrex assessment, item three, represented a quality assurance problem to you.

A (By Dr. Bernsen) I disagree. I would have to know more about it. It could -- let's say it could.

A (By Mr. Lopez) I don't recall a specific review of that item number three.

A (By Dr. Bernsen) We did not look at that specifically. It is addressed in the Bechtel task force line item 167.

Q Which I believe states that Bechtel agrees with Quadrex?

A (By Mr. Bernsen) Has a concern with regard to the roughage questions, right.

(No hiatus.)

Q Well, in response to questioning from your attorney in direct, you were asked if you had considered 4.5.5.1(c) in your consideration of generic finding 3.1(b). 4.5.5.1(c) clearly references M-49 as one of the questions.

When you answered yes to that question, were you saying that you only looked at the discipline finding, but did not look at the underlying question?

A (By Mr. Lopez) No, that wasn't my intention. I was attempting to respond to both the discipline finding and the underlying questions, but I must admit I don't recall the specific item number 3 under the Quadrex assessment when I was reviewing that.

Q And let me just get a feel for the process you went through just now. You reviewed a number of documents in order to reach your conclusion as to whether you had looked at this particular question. And the documents you looked at -- well, if you would, tell me which documents you used as the fundamental basis of your testimony.

A The testimony, the written testimony?

Q The written testimony.

A Okay.

I think, as I described earlier, the first thing that I did, and I think the question was related

to the generic finding, was to try to review the generic finding to see if I, in my mind, could capture what I felt was the significant issue that Quadrex was attempting to address. The way I viewed that particular aspect, the relevant information that Quadrex was attempting to reach in 3.1(b), was a concern relative to the variability of the review of vendor reports being done by Brown & Root. And in that respect, I was looking at the underlying questions to try to see if I could determine whether or not there was, one, a basis for the statement of, if you will, variability.

I think the terminology that Quadrex used was quality of review, although Mr. Stanley testified that he was not thinking of that in the sense of quality assurance but more in the sense of the depth of review that was being performed by the reviewers. And in that sense, you know, I was attempting to try to determine whether or not there was a general agreement that there was a variation in the depth of the review that was performed.

Q So, you looked at the Quadrex report?

A And I should make one other point. And, in addition, with respect to the 3.1(b) discussion, further relative to whether or not there were procedures for documenting those reviews, which is also a part of the

question that's being raised under 4.5.5.1(c). So, the emphasis of my assessment, if you will, went to the variation in the reviews and whether or not I felt there were procedures in place for documenting those reviews.

Q But in responding to my question, my question was really what basic documents you looked at. For example, I noticed that you came to get the NRC NUREG 0948. Is that one of the documents you used in generating your testimony?

A Not really. The reason that I went to that document is that as part of the report, the NRC attempted to develop some form of cross-reference between questions and discipline findings and generic findings and I wanted to make sure that I got quickly to the discipline finding that related to that. Since you had identified the question, I did not clearly recall which discipline finding related to it, so I used it for that purpose, not --

Q Did you get to 4.5.5.1 before I mentioned it? You were already there when I mentioned it?

A Yes.

Q Right.

A Yes.

Q By using NUREG 0948?

A Used NUREG as a -- basically what I did was I

looked at I believe it was Appendix C of that document which lists the various questions and the discipline findings that reference it. So, if I went there, found that -- there's a series of questions, 4.5.5.1 and 3.1(b) identified as referencing that. So, it was merely a shortcut to try to get to the discipline finding.

Q Back to you, Dr. Bernsen. Your statement was before you could say there was a quality assurance problem in item 3, you'd have to have more information.

A (By Dr. Bernsen) Yes. I mean, first of all, there's no indication from, say, an engineering review of that observation in the assessment or in the question that there was a significant safety problem associated with the component. So that from a quality assurance standpoint, I would not have been advised that there was a significant problem.

Now, as I say, I don't know why engineering judgments indicated that that particular statement in the Quadrex report was a non-significant issue. And, therefore, I'd say I'd have to know more about it.

You understand what I'm saying?

Q I missed a little bit. You said engineering judgment determined this was not a non-significant issue?

A What I'm saying is that no technical review has indicated that 4.5.5.1(c) and the underlying questions resulted in a significant deficiency.

Q Well, let me ask you, with your quality assurance hat on, if you're looking at this what Quadrex says is even a cursory examination, not even an in-depth examination of a vendor's stress report that contains items A, B, C, D and E in that report, and this is an item that Brown & Root has gotten and reviewed and it still has these things in it, do you not feel then at that point you have enough information to know that you have a potential quality assurance problem?

A Not without additional information.

Q And the additional information would come from engineering evaluating the actual component that was ordered through this report?

A I think first of all I'd need to know specifically what were the requirements, what was the status of the document review, did the engineer consider that the results were acceptable on some other basis. None of that information is available, so I don't really know whether this is merely an observation or whether it's a specific violation or finding with regard to the requirements. That information is not contained therein. It's not a complete story or picture of the

situation.

Q And you would have to have the complete story before you would consider it a potential quality assurance problem?

A Unless engineering told me that their judgment was that this was a deficiency --

Q So, you would --

A -- of some significance.

Q Excuse me. Of significance you said?

A Yes.

Q You would send this identification of the problem 3 over to engineering and say tell me if this is significant, is that what you're saying?

A Yeah. Essentially give me more information. At this stage it's an observation that needs further follow-up.

Q Looking at question M-50, Dr. Bernsen, in the Brown & Root response, first of all, in the last line it states that no special operability tests are performed for valves which must operate during pipe rupture. Do you consider that a quality assurance problem?

A Not without some engineering evaluation of whether that was necessary. I do know that valves of certain sizes and types are qualified or can be qualified by analysis. I also know that it's preferred

to do it by testing. But I think again I'd have to rely on some engineering evaluation of whether this was a significant deficiency.

Q Are valves that must operate during pipe rupture qualified by analysis?

A (By Mr. Lopez) You know, valves that are -- all valves that have to be addressed with regard to operability can be qualified either by analysis or by testing or in some cases a combination of both, regardless of whether or not pipe rupture is the consideration.

Q So, you would disagree --

A Well, let me further state, the pipe rupture oftentimes leads to an analysis by some form of analysis because the loadings that are specified for pipe rupture are severe enough to cause great difficulty in simply testing it. It's very difficult sometimes to put the kinds of -- to simulate the kinds of loads that are predicted. So, oftentimes an analysis is the only practical way, usually an analysis in combination with some operability testing or based on prototypes or something along those lines.

Q So, turning to the Quadrex assessment on the next page, item 2, you would disagree with the Quadrex position on this?

MR. FRANTZ: I'm going to object to this entire line of cross-examination. I'm not sure what the relevance is to finding 3.1(b) which is the finding I believe which is at issue here.

MR. SINKIN: Well, 3.1(b) references -- well, we got from 3.1(b) to 4.5.5.1(c) which they said they had reviewed as part of their review of 3.1(b). 4.5.5.1(c) references question M-50.

MR. FRANTZ: And M-50 has several parts, including part 4 which talks about guidelines for review and approval of vendor reports. I don't see where the remainder of that question and answer in the assessment is relevant.

Q (By Mr. Sinkin) Well, let's talk about item 4, Dr. Bernsen. I think we need to set a context here.

Let's say you're HL&P. You hired a consultant. They've spent 2400 hours evaluating the design and engineering program of your architect engineer and they have presented you with this report. And a finding is that Brown & Root has no procedure providing guidelines for the consistent review and approval of vendor reports. Do you consider that you have a quality assurance problem on your hands?

A (By Dr. Bernsen) No.

Q Why not?

A Because guidelines for reviews are generally considered desirable documents but not essential documents. There are basic procedures for the review, indicating the process of review, designating responsibilities and things of this nature. But -- except for very general guidelines and procedures such as, you know, making sure that the -- general instructions on making sure that it meets the specification requirements and perhaps some generalized observations on things like fit, anchor bolt locations, things of this nature, it isn't essential to have detailed guidelines, no.

Now, Frank, do their procedures contain guidance on review of vendor documents? I thought they did.

A (By Mr. Lopez) They do indicate guidance on the review and what should be looked at.

I think, as we commented in our testimony in response to question 39, on, yes, answer 39 on page 39, that we agree with Quadrex that it is a good practice to provide additional guidance for the review of vendor reports in addition to what was shown in their procedures.

I think it's worthwhile pointing out that particularly with respect to the items in the ASME area,

which my recollection was that was the area that was being discussed particularly with regard to M-49, a somewhat unique situation relative to quality assurance applies in that the industry has established through the ASME code and the, if you will, industry quality assurance programs that apply, recognize that detailed technical expertise of various organizations that are certified to operate under the quality assurance program umbrella of the ASME code, that they have their technical adequacy and the, if you will, the quality assurance aspects of how they perform their work, their technical adequacy as well as QA programmatic adequacy reviewed by the ASME code, the ASME code committees.

Part of the reason for that is that, once again, it's a question of technical expertise and also to provide some consistent industry-wide guidance not necessarily requiring, as an example, a recipient user of ASME code items having to have the technical expertise within his organization to review technical adequacy of work done by designers, analysts, that may only exist in a contracted organization like the ASME valves.

The way that the ASME code attempts to try to provide assurances that individual, if you will, users or individual organizations that may contract for ASME

code items, some assurance that they can rely upon, if you will, this umbrella quality assurance activity are the procedures that they establish for auditing of those organizations, technical review of those organizations, certification of those organizations and their authorization to certify their own documents, if you will, to perform design verifications of technical adequacy of their own work. So that recipient organizations need not have the same level of technical expertise in their organization to be able to independently judge the technical adequacy of what's --

Q But the situation we're in here is if you're Brown & Root, you received an item, you received a vendor report. I'm Quadrex. I come along, I look at the vendor report and I find that the stresses were not calculated for the ASME 3 code and I tell you that.

A Right.

Q Now, do you consider you have a quality assurance problem? Maybe it's at the vendor.

A Well --

A (By Dr. Bernsen) You've got to understand, you're postulating a situation that may or may not exist here. I don't know what the true story is. That's a Quadrex observation.

Now, recognize that Quadrex observations were

reviewed by Brown & Root at the time. They have been reviewed by Bechtel experts subsequently. To my knowledge, none of these reviewers have identified that specific item as a significant deficiency so that there may be a story that isn't apparent here and you're speculating that there's more to it than there may be.

Q I'm putting myself in the position of HL&P on May the 8th, 1981. This is what they have with the Brown & Root response.

A With advice from Brown & Root.

Q Now, is there something in the Brown & Root response that tells you you don't have a quality assurance problem in item 3 of question M-49?

A (By Mr. Lopez) May I see that?

MR. FRANTZ: I think this question's been asked at least twice before whether item 3 in M-49 presents a quality assurance problem.

Q (By Mr. Sinkin) The question is is there something in the Brown & Root response delivered May 8, 1981, that tells you you don't have a quality assurance problem. Is there some basis in that for saying you don't have a quality assurance problem.

A (By Mr. Lopez) The Brown & Root sheet for this indicated that there was insufficient data for assessment. They saw no evidence this concerned impacts

of safety to the public and, therefore, did not consider it reportable. They went on to say that the programs established for verifying the seismic and 1-E qualification report adequacy. I think they're addressing once again the general scope of that discipline finding rather than each individual line item in the questions that were referenced, or apparently so.

And I guess I would like to add that the way I see Quadrex' assessment of the M-49 question is that the B&R review of this vendor report was seriously deficient, but that the review of this report was deficient.

The point I was trying to make relative to Brown & Root's technical expertise to review stress analysis performed by an ASME certified supplier might make it quite likely that they would not necessarily be able to perform the level of detailed review to be able to determine that adequacy. They might not have the people available for that. Quadrex was commenting on the fact that they found that to be a concern.

I also believe that, once again, in referring to Mr. Stanley's testimony of yesterday, that you asked him whether or not in this particular area relative to vendor report review he saw any quality assurance problems with any of the findings in questions that they

found and he indicated that he did not.

Q All I'm asking is do you agree with that?

A Based upon the information that I have here, yes. But I don't know -- I cannot honestly say that I know the resolution of the specific questions that were addressed in item 3 of the Quadrex assessment of M-49.

Q On May 8th, 1981, did HL&P know the resolution of those items?

A Not to my knowledge. The statement in the Brown & Root response does not indicate anything that I can see specifically addressing that item. I don't know if they may have had it from some other source.

Q Do you know of any source other than the Brown & Root comments that the Houston review team had with them in that meeting? Or are you saying just --

A I don't know of any myself. The only thing that I have heard in testimony here were statements by Mr. Goldberg and Dr. Sumpter that they also had some -- apparently had some information based upon their own knowledge. But I'm not aware of that.

JUDGE BECHHOEFER: Mr. Lopez, in a situation like that, would you consider that the matter might be considered potentially reportable and subject to later withdrawal if it turns out not to be?

MR. LOPEZ: Well, I think without, you know,

going back to the -- what I would do in a situation like that, confronted with that in this fashion would be to try to determine with the help of whatever engineering expertise was available to me, first of all, whether or not the statements that were made were, in fact, correct clearly. And, secondly, if correct, whether or not I saw any potential for safety significance in those findings.

The statements as I read them may or may not have such implications. And without looking at the specific comment against the document that's being reviewed, I would have a difficult time judging that, you know, in isolation of that information.

JUDGE BECHHOEFER: At least insofar as safety significance is concerned, do not the I&E guidelines suggest that that kind of thing be reported when the safety significance is determined or not determined, as the case may be, the matter then be either withdrawn or confirmed? The I&E guidelines that I'm referring to are the ones that say if you can't determine within fourteen days, report it and then determine it later.

MR. LOPEZ: The April 1, 1980, I&E guidance manual or I&E guidance --

JUDGE BECHHOEFER: Either of you.

DR. BERNSEN: I think we're going pretty far

beyond the substance of that observation, though, because at least you have to find out whether there's a deficiency. That's really what Frank is saying.

In other words, what was the nature of the report they reviewed? Was it the final report? Was it certified by a professional engineer? Was there a preliminary report? Was that requirement in the specification an essential requirement? You know, is it really a deficiency?

Perhaps if the investigation -- if the identification of its safety significance beyond that point was not easy to determine, then I believe that one would report it as potential. It may be that it was clearly easy to identify the lack of safety significance. But there's a lot of speculative things here that we don't have with regard to that question and that's the problem. If you pose a hypothetical, it would be a lot easier.

Q (By Mr. Sinkin) Dr. Bernsen, let me --

MR. SINKIN: Do you have a question, Judge Shon?

JUDGE SHON: Yeah, I think.

This specific thing that we're talking about here in question M-49 in this Quadrex assessment 3 says things like the stresses were not calculated according

to the ASME 3 code, there's no summary of applied loads and all that sort of thing. And the valves referred to are evidently supposed to be qualified for seismic loading. At least it says so, a page before that it mentions seismic loads.

Isn't it sort of reasonable to presume that they're important to safety one way or another if they've got to qualify for ASME 3 and seismicity and all that sort of thing? I mean --

MR. LOPEZ: Well, I think it's safe to assume that by virtue of them having been specified as ASME code valves, it was probably that these valves were being used in some safety-related service. I say probably because Brown & Root did have some systems for which they specified ASME code requirements for non-safety-related systems, but that's -- I think the initial presumption would be that this valve order, if you will, the entire specification probably went to purchase all butterfly valves whether they be safety-related applications or not. That would be the normal expectation. In other words, they would typically not have a separate --

JUDGE SHON: You would specify all the butterfly valves to safety-related specs whether they needed them or not?

MR. LOPEZ: No, no, no. All the valves which they had committed to provide as ASME valves would typically be ordered under the same specification. There were some instances where they were using ASME code requirements for systems that were not safety-related.

JUDGE SHON: Well, it just seemed to me natural to assume from what has been said here that, first of all, the valves ordered probably had a safety application.

MR. LOPEZ: I agreed with that aspect of your question.

JUDGE SHON: And, secondly, that they probably were not handled properly in the exchange with the vendor since the vendor didn't calculate the stresses at all. It seems --

MR. LOPEZ: I don't think that's -- that's not the way that I characterize it. It says the stresses were not calculated per the code. I don't -- I was not reading that to mean that they weren't done, only that the reviewer did not seem to think it was in accordance with the code.

JUDGE SHON: I see. Well, then it seems as if these things that you have specified and that you have mentioned that they may not have been safety-related, it

may have been done right and all this sort of thing, at least at first flush don't seem to offer an out from this sort of thing. It looks as if there was a mistake made and it was in the safety-related system, doesn't it? At least at first glance?

DR. BERNSEN: It looks like there may be a mistake, as you say or characterize a mistake. But what I am really saying is now from a QA perspective, let's forget the engineering because I think that it's been fairly -- a number of people have gone over this finding and the underlying questions and not found it necessary to consider this potentially reportable or reportable or anything of the sort. There must be some underlying reasons that we don't have obvious to us right now.

Now, I can't consider a suspected deficiency on a single component that isn't considered potentially reportable as evidence of a QA program breakdown. That's really what I'm trying to get at. That I --

JUDGE BECHHOEFER: Well, Dr. Bernsen, you're supposed to be determining or telling us whether it is potentially reportable or reportable. So --

DR. BERNSEN: Okay. But I guess there's two aspects. One is the question of program breakdown, generic problem, significant breakdown. And I really can't see how a non-potentially reportable item could be

considered -- a single case or even several could be considered as evidence of a program breakdown. That's the first thing.

MR. FRANTZ: Mr. Chairman, I might also note that we are offering these witnesses purely from the standpoint of determining whether or not there is a significant quality assurance breakdown evidenced in the specific findings called out by the Board. We did not ask them to perform a review to determine whether or not there was a significant deficiency in the final design for release for construction. Therefore, they have not gone through the types of engineering analysis you might need to determine the safety significance of some of these findings.

JUDGE LAMB: If you read the first item under the Quadrex assessment, you come out with -- well, let me ask you whether that establishes the context in which it says that the seismic load seems unduly restrictive and talks about financial impact. Are they saying, in effect, that this is an overly conservative approach in your view or not?

MR LOPEZ: In that line item, yes.

JUDGE LAMB: Now, does item 3 fall within that context or not?

DR. BERNSEN: Not necessarily and technically

probably not. If these valves were specified to the code and if they're talking about a code-covered portion of the valve, then a serious design deficiency in implementing the code would be cause for concern.

Now, it may turn out, however, that the designer could say, well, I over-specified my requirements and even though this analysis shows some deficiency, I can't change my requirements and make it comply with the code.

So, there's all kinds of options. But I'm not sure that the two are -- I can't say they're related or not related.

JUDGE LAMB: Thank you.

Q (By Mr. Sinkin) Let me --

MR. SINKIN: Are you finished?

JUDGE BECHHOEFER: Yes. Go ahead.

Q (By Mr. Sinkin) Well, Mr. Bernsen, let me ask you, in the draft of the Bechtel task force report in the response to item 167, line item 167, did Bechtel take the position that Brown & Root's approach to vendor review was reasonable and ignore the specific quality problems pointed out by Quadrex? Is that not what Mr. Stanley is complaining about in comment 30 of CCANP 104, and actually an Applicants' --

MR. FRANTZ: We now have a question pending

already.

MR. SINKIN: I'm sorry. He's looking at Applicants' 72 where all this information is contained.

A (By Dr. Bernsen) I don't have the draft task force assessment in front of me. I'm not sure that's available. I have a comment from the task force that says they revised both its assessment and assigned category to accommodate the Quadrex comment.

(No hiatus.)

Q Was catogory 6 previously changed to catogory 4?

A (By Dr. Bernsen) That's what the footnote shows.

Q Haven't you, in fact, done the very same thing in preparing your testimony for this hearing that was done in the draft of the Bechtel task force report, ignore the specific quality problems and abstract a general question as to whether Brown & Root's vendor procedures are adequate?

A I don't think so. That's still my position, that in the context of what we're addressing, the questions were addressing, I don't think it changes.

Q Can you tell me how you would prepare testimony to respond to whether item 3.1(b), a generic, finding is reportable or potentially reportable and not look at question M-49?

MR. FRANTZ: I object. There is no foundation for that question.

MR. SINKIN: The witness said he did not review question M-49.

MR. FRANTZ: He never said that.

JUDGE BECHHOEFER: I thought he said in conjunction with this particular finding, he didn't. But maybe I'm wrong.

A (By Mr. Lopez) I think what I testified to was to the relevance of the -- as I understood the Quadrex comment which was relative to the availability in the review and as to the documentation of the vendor report review process.

Q (By Mr. Sinkin) Let's get this straight. Did you look at -- Mr. Lopez, did you look at question M-49 when preparing your testimony on whether generic finding 3.1(b) was potentially reportable?

A (By Mr. Lopez) As I think I testified earlier -- yes, to the question -- I looked at the question. But as I have testified, I looked at it primarily with respect to whether or not it tended to confirm or not the statement from Quadrex as to whether or not there was a variation in the depth of vendor report reviews.

Q And did you find there was a variation in the depth of vendor report reviews?

A Yes, I did. The variation -- I did not find -- I did not determine from my review that I found a significant quality assurance program breakdown in the process of vendor report review, which is -- which was the primary purpose of my testimony.

Q I believe in discussing a significant quality assurance breakdown, Dr. Bernsen, you used the term "generic." Is that correct?

A (By Mr. Bernsen) I believe I used the term "generic."

Q But you in the context of the word "generic," will you tell me how you're using the word to determine whether you have a significant quality assurance breakdown?

A With regard to a process or procedure or practice, evidence of more than single isolated occurrences, a more generalized condition.

Q 50.55(e) says, "A significant breakdown in any portion of the quality assurance program. Is the review of vendor submitted reports part of the quality assurance program?

A Yes, review of -- review of vendor documents is a procedure that's generally covered in the engineering program, yes.

Q Can you point me out, Mr. Lopez, in answer 35, where the problem of the variability in vendor reports is called forth in your testimony?

A (By Mr. Lopez) I did not respond to that particular portion at the response to question 35. 35 was merely trying to summarize the characterization of 3.1(b). I attempted to respond; we attempted to respond to that question later on at response to question number 39.

Q Can you point me out in answer 39 where you're addressing the variation in vendor reports?

A (By Mr. Bernsen) It doesn't say "variation of vendor reports."

A (By Mr. Lopez) I didn't use that terminology. I point to what my testimony -- how my testimony attempted to deal with that. I didn't use the terminology variation of vendor report reviews.

Q But you told me earlier that variation of vendor reports was how you perceived the generics. Am I correct?

A Not variation in the reports, themselves.

Q The vendor --

A Inconsistent review of the vendor reports, themselves; the variation in how those reports were reviewed by Brown & Root engineers. That seemed to be the way I understood the Quadrex concern.

Okay, would you ask the question again?

Q Are you saying that answer 39 responds to the variation in how Brown & Root reviews vendor reports?

A I believe so.

Q Can you show me were in 39, or is it the entire answer?

A It's encompassed in the whole answer but I can point to specific sections in you would like.

A In the initial response, it's indicated that it appears that Quadrex was concerned with the extent to which Brown & Root was performing these functions rather than their total absence, which is reviewing, verifying the work of subcontractors and vendors. And then in general discussion of that, we talk about the methods that are typically used by architect engineers, purchasers that, is to confirm the adequacy of activities performed by suppliers in terms of the kinds of reviews that are performed, including the inspections of products upon delivery of which a review might be one example.

Then particularly with respect to the verification aspects relative to those checks or design reviews or work done by other subcontractors or vendors, we addressed the question of whether or not it is always possible or practical for a purchaser to have the technical expertise to perform such reviews and whether or not reliance upon the vendors own verification process might be appropriate under Appendix B.

Q That's the same response you gave when you were discussing item A in M-49, the stresses not calculated per the ASME III code. Were you responding directly to M-49, item 3-A when you wrote that statement?

A Item 3-A.

Q That's the stresses not calculated per ASME III

code.

A I think as I've previously testified, I don't -- you know, I was not specifically addressing that line item.

Q Based on the Quadrex findings -- I'm sorry, were you finished your review?

A I was just checking to see. Only that concluding statement on page 39 which is referenced before that we agree with Quadrex that it would be a good practice to provide additional guidance to reviewers of vendor reports.

Q So based on the next to the last statements, in 39, in light of the findings in M-49, would you make any modification to the statement beginning "also it may be noted"?

A I would not.

A (By Mr. Bernsen) No.

Q You don't consider M-49 item three as identifying significant safety deficiencies in the work performed by this particular vendor?

A (By Mr. Lopez) Not based upon the information that I have, that I relied upon for this testimony.

Q Let's turn to M-51, item three under the Quadrex assessment.

MR. SINKIN: Excuse me. Before We do that,

since this is a separate question and it would be an inquiry of some length since we're at 6:00 o'clock, I think I'll break here.

JUDGE SHON: Suits us.

JUDGE BECHHOEFER: I think that's a good idea. We'll be back tomorrow at 9:00 for soils.

(Recess at 6:03.)

CERTIFICATE OF OFFICIAL REPORTERS

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

NAME OF PROCEEDING: EVIDENTIARY HEARING
HOUSTON LIGHTING AND POWER COMPANY, ET AL (SOUTH TEXAS PROJECT, UNITS 1 AND 2)

DOCKET NO.: STN 50-498-OL
STN 50-499-OL

PLACE: HOUSTON, TX

DATE: Wednesday, July 31, 1985

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

R. Patrick Tate, CSR

Susan R. Goldstein, CSR

Official Reporters