ENCLOSURE 4

ORIGINAL

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of:

MEETING WITH CYGNA ENERGY SERVICES
ON INDEPENDENT ASSESSMENT PROGRAM
(IAP) FOR COMANCHE PEAK

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[illegible] Street, N.W. Suite [illegible]
[illegible], D.C. [illegible]
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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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NRC Meeting with CYGNA Energy Services :
on Independent Assessment Program :
(IAP) for Comanche Peak :
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- -x

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

The meeting in the above-captioned matter convened at 9:13 a.m.

PARTICIPANTS:

Spottswood Burwell

B. J. Youngblood

Richard Bachmann

David Terao

Frank Rinaldi

John Gilray

Hulbert Li

Ona Chopra

Dave Lynch

Jim Gagliardo

T. A. Ippolito

N. M. Shulman

David Pigott

N. Williams

Lee Weingart

A. E. Moersfelder

John Peter Russ

Stephen Bibo

Gordon Bjorkman

J. B. George

D. H. Wade

N. S. Reynolds

Annette Vietti

lpbl

P R O C E E D I N G S

MR. BACHMANN: On the record.

MR. YOUNGBLOOD: Good morning. We are here basically, to meet with CYGNA Energy Services with regard to the independent assessment program for Comanche Peak. Our meeting today will be transcribed. We want to basically talk about whatever things you might wish to talk about.

But basically, the February 6th, and March 22nd, and March the 30th letters, and your responses. I would like to delay discussing the March 22nd letter until after lunch today, because one of our individuals that will be involved in that will not be here until afternoon.

The meeting is basically between the Staff and CYGNA. If there are other people who have any questions that they want to ask, we will entertain those at the end of the meeting. If there is some clarification that anybody wants, while possibly that might occur during intermission or something like that.

I guess to begin with, CYGNA, do you have something that you want to say?

MR. SHULMAN: We would just like to be responsive to the questions.

MR. YOUNGBLOOD: Do you have a presentation prepared in regard to the March 30th letter?

MS. WILLIAMS: Yes.

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MR. YOUNGBLOOD: Would you prefer us to just start asking questions? Or do you want to do the presentation and see if that takes care of our questions?

MS. WILLIAMS: I will do the presentation if you wish. And then we will do question and answers as we go along.

MR. YOUNGBLOOD: Tom, do you want to add anything?

MR. IPPOLITO: You briefly mentioned it, Joe. This afternoon we will be discussing the matter of independence and some of the questions may involve the people that will be here this afternoon.

So when we go over those questions, we will have to defer them until the afternoon.

MR. BACHMANN: Off the record.

(Discussion off the record.)

MR. BACHMANN: Back on the record.

MS. WILLIAMS: This has been structured to go through both of the letters, as you can see by the introduction here. I do have slides on the basic scope, methodology, generally how we did the review.

So if questions come up along those lines, we can go back and discuss that. This is taken literally from the letter, assuming that everyone is somewhat familiar with what the issues were. You will maybe want to stop me if I'm going too fast.

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(Slide.)

The first question we are now dealing with the March 30th letter, dealing with design change control at Comanche Peak. We have broken that into two questions. The first being to assess the adequacy of the document control system, to assure that the plant was constructed in accordance with all design changes, prior to the introduction of the computerized database tracking system.

The second part of that question, we have interpreted to be, to determine the adequacy of the document controls of the piping and pipe support drawings and design changes, since they are part of the manual system. Or what is currently the manual system.

(Slide.)

Regarding the adequacy of the construction of the plant, prior to implementation of the computerized data tracking system, we did perform an as-built walkdown of the spent fuel pool cooling system. It was the only completed system at the time of our review. And we did check to see that all of the hardware was constructed in the field in accordance with the drawings, and any outstanding design changes in circulation at the time of that walkdown.

Secondly, there is a fairly intense effort at the time of our review, currently ongoing at Comanche Peak, where they were doing a validation process of what is referred

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to as the DCTG or design change tracking group database. That database is what is now serving as the core of the DCC index or logging system of design changes, where they were sequentially going through every CMC and DCA to ensure that they had been accounted for in the drawings and in the system.

That was not yet completed, though at the time of our review.

(Slide.)

MR. YOUNGBLOOD: It might be a good idea, Nancy, if you go over sometime, what the scope was, of what the review was supposed to be. Just for the record.

MS. WILLIAMS: Maybe I could do that to start off.

MR. YOUNGBLOOD: Maybe you ought to do that to start off.

MS. WILLIAMS: Just general, what Phases I and II are. Let me get those slides.

(Pause.)

MS. WILLIAMS: Would you like to start with the purpose, or is this going back too far?

MR. YOUNGBLOOD: You might briefly go through that. It is basically -- what I'm after for the record, is the scope of what this review was to cover.

MS. WILLIAMS: Very briefly, the purpose of the independent assessment program, or Phases I and II, as they

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are referred to, was to provide supplementary evidence and additional assurance regarding the overall design of Comanche Peak, given that other reviews had been conducted by organizations such as the NRC, and in the SIT and CAT evaluations.

There were several letters which were sent between Texas Utility and the NRC regarding specific issues that they felt should be addressed. And it was around those letters that a determination was made as to what the scope of Phases I and II would be.

(Slide.)

The program objectives were to provide an assessment of the adequacy of the design control program. The design control program was Gibbs & Hill, the engineer. We wanted to provide an assessment of the design adequacy of a selected system, verify a selected as-built configuration, and evaluate the implementation of selected elements of Criterion III of the design control program.

I will go through each one of those now, specifically as to what hardware we did that evaluation for.

(Slide.)

Some criteria that was set forth in discussing I referred to previously for establishing the scope were to include a cross-section of disciplines, include a system which exhibited characteristics which were significant,

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pressure, temperature, significant to safety, which could not be verified by normal means, such as testing.

We wanted to include several organizational interfaces when dealing with the design control aspects of the review. We wanted to make that we touched on design changes. And we wanted to make sure that we identified the specific concerns and addressed those that were contained in the letters.

As a general guideline for our reviews, we selected a system. And in each case Phase I had one system. Phase II we selected a different system. And we used that system as the basis for selecting the documents that will be reviewed for the design change aspects of the review. And then also to serve as a basis for the design portion of the review.

The system selection criteria, as I just stated, was that it had to be safety related. It had to include a material interface with Westinghouse, the NSSS vendor. It had to include an interface with Gibbs & Hill, the architect engineer. It had to meet the design parameters, and we needed to have one that was started -- was turned over to startup, signifying that it was a completed system.

Now we could not get all of these things necessarily built into one system. And part of the evolution of the program was that we started out doing a more limited scope

lpb7

than what Phase II turned out to be, that the completion of it. And we ended up having to select two systems to complete our review. And I will try to make that distinction now, because it seems to lend to a little bit of confusion.

(Slide.)

Phase I, we used the spent fuel pool cooling system to serve as the basis for that review. That review consisted of, in the implementation side of evaluating the design change control system. Which means that we used the paperwork associated with the spent fuel pool cooling system to do that review. It included an implementation evaluation of interface control. It included a walkdown of the spent fuel pool cooling system, which is where we get to wanting to select a system which was turned over to startup, so that it was essentially complete.

And then in a programmatical sense, which is not tied to the system, we evaluated the design control systems for Gibbs & Hill and for Texas Utilities.

(Slide.)

I would like to ask and make sure at this point in time that the difference between a programmatical review and an implementation review is clear. That when we are doing a programmatic review, what we are doing is making sure there is a program in place, which complies with all of the requirements of ANSI-N45.2.11.

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What we do is we check that all of the procedures are there. It is documented in what we call the design control matrix, which is contained in the draft report. It is not a check as to whether they followed the procedures. It is a check as to whether they have a program in place which has all of the essential procedures to carry out the requirements of ANSI-N45.2.11.

The implementation reviews, the walkdowns, design change controls, and the interface control are checked to make sure that the procedures are being followed. And that in fact, the work is being implemented in accordance with those procedures.

Are there any questions on that one?

That was Phase I. We now move into Phase II, where it was determined that we would do a design review. It was felt that the spent fuel pool cooling system perhaps did not exhibit all of the parameters that you might want to check in a design review. And the RHR system Train B was selected.

We refer to the design review as another implementation evaluation. Additional implementation evaluation was conducted for Phase II, design analysis control. There were no additional programmatical reviews conducted. And that essentially makes up the scope of Phases I and II.

So we ended up with five implementation evaluations

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and two programmatic reviews. I can go through the RHR design review in a little more detail if you want to see what the various components that each of the disciplines looked at. Would that be helpful?

MR. YOUNGBLOOD: I don't know if we really need that. Unless anyone else --

MS. WILLIAMS: To summarize this pictorially here is a slide.

(Slide.)

You can see that these are the programmatical reviews shown on this slide, where Gibbs & Hill design control program, Texas Utilities design control program were evaluated in the five aspects of the implementation evaluation.

That makes up the scope unless you want to go into methodology or any greater detail.

MR. BURWELL: May I ask for one bit more of information on this particular slide? Over in the five implementation reviews, would you identify which of these related to the RHR, and w[illegible] related to the spent fuel?

MS. WILLI[illegible]d idea. Okay. Going down from the top then. Design analysis control that was performed as it pertains to the RHR system. Design change control was performed as it pertains to the spent fuel pool cooling system, as was interface control for the spent fuel pool cooling system.

lpb10

MR. YOUNGBLOOD: The rationale for that was complete and turned over.

MS. WILLIAMS: It was really driven by the as-built verification. And then we had selected to do two elements of Criterion III. And they also followed then with using the spent fuel pool cooling system.

end 1.

The as-built verification was the spent fuel pool cooling. The top three are RHR and the bottom one is the spent fuel cooling.

Going back to March 30th, the design change control, now referring to the spent fuel pool cooling system, we are addressing two questions. One being, does the current installation match with the documents in circulation? And a statement on the controls associated with the piping and pipe support change papers, since it is currently a manual system.

(Slide.)

Real quickly then with reference to the first item, the as-built walkdown is what we relied on for installation being in conformance with all of the outstanding change papers, and the database process validation that was in progress at the time of our review for the computerized database system.

(Slide.)

A little history on the computerized system to explain why the piping and pipe support drawings are not currently part of it. The Gibbs & Hill design verification tracking system served as the original basis for the computerized system, which now makes up the DCC tracking system as such. Not all drawings, not all designs were under the responsible of Gibbs & Hill for the design

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verification. And specifically, the pipe supports were not the design responsibility of Gibbs & Hill.

The large bore piping and pipe support drawings will be entered into the database upon completion of those drawings vendor certification and incorporation of all design changes. The process is still ongoing. They are controlled by a manual system right now.

The small bore piping as well, only Texas Utilities has elected, not necessarily to incorporate all of the design changes for the small bore piping and pipe supports. But upon vendor certification and as-built drawings being produced, as well as the design changes which are associated with those drawings. They will then be incorporated in the computerized tracking system at DCC.

The pipe supports and piping are part of the as-built program. They do have 79-14 as-built verification program in place. We did use those drawings, for example, for our spent fuel pool cooling walkdown.

The vendor certification includes a final check of each support as-built configuration and the associated calculations. I think it is important to note here that the discrepancies that we found in our observations for the manual tracking system prior to the implementation of the computerized tracking system were not associated with the piping and pipe support drawings. They were, rather with the

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structural and electrical drawings, which are part of the computerized system, part of the database validation process. Were not necessarily the focus of our concern at the time of writing the observations on DCC.

MR. TERAO: At this point we should have questions on the last item. For the design change controls, you said that was done primarily, or only for the spent fuel pool cooling system. Not for the RHR; correct?

MS. WILLIAMS: That is correct.

MR. TERAO: For the design changes that are applicable to the spent fuel pool cooling system, would you say that those changes are typical of the kind of design changes as far as the complexity in those systems?

MR. BACHMANN: Off the record.

(Discussion off the record.)

MR. TERAO: As far as the design change controls on the spent fuel pool cooling system, would you say that the type of design changes that were made in the spent fuel pool cooling system were typical of the type of changes that were made on other systems, in terms of complexity?

MS. WILLIAMS: Are you speaking of the mechanical, the piping, pipe support drawings, or just in general?

MR. TERAO: Piping and pipe support drawings.

MS. WILLIAMS: It is a little tough to answer because of the time frame. When we were looking at the

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spent fuel pool cooling, there were less design changes outstanding because they had gone further along in the process of incorporating them. It was closer to completion, or was actually completed.

The RHR system, there were perhaps a few more design changes. We did not really evaluate complexity on the spent fuel pool cooling system. However, the supports are more simplistic there than what we are finding in the Phase III review that we are doing right now.

MR. TERAO: So the spent fuel pool system, the supports are simple. Would you say that the system itself is in a congested or a noncongested area?

MS. WILLIAMS: Relative to other parts of the plant, it is uncongested.

MR. TERAO: And would you say that the congestion or the noncongestion of the spent fuel pool cooling system is typical of the rest of the plant piping systems? Or not typical?

MS. WILLIAMS: I guess I would like to defer answering a question like that until we do the walkdown on Phase III, which we are intending to do. I think that is something we are going to be looking for.

Having only done the walkdown on the spent fuel, and we did not do a walkdown on the RHR, it is somewhat conjecture to make a response to that right now, I think.

We are going to, as part of, actually on Phase IV the component cooling water system do a walkdown.

MR. TERAO: You may not have performed the formal walkdown, but you must have walked through the plant and seen the type of congestion or noncongestion that there could have been for the remaining part of the plant.

Would you say that most of the plant is typical of the spent fuel pool system in terms of congestion?

MS. WILLIAMS: I think I see your question. No, it less congested. The spent fuel pool cooling area is less congested than other parts of the plant.

MR. TERAO: Can you conclude then that the type of design changes that might be outstanding, or the type of design changes that were made on the spent fuel pool cooling systems are not as complex as the other systems, where congestion could be a problem?

MS. WILLIAMS: I'm getting confused. When we're talking about design change control and the complexity of the design changes, we are looking at tracking a number of design changes. It was not just with regard to the piping and pipe supports. It was structural and electrical.

When you say complexity, then I start looking into the design area, where our engineers would be evaluating how complex they are; whether they were incorporated into the analysis correctly; whether the calculations reflected

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the design as it existed.

So are you saying, complexity in a technical sense?

MR. TERAO: I am assuming that the more number of design changes you would have would be indicative of the complexity of the changes to be made to the system.

MS. WILLIAMS: It is possible. But I do not know that it necessarily follows. So many of them in the spent fuel pool cooling system had been already incorporated into the drawing that you would really have to go back and go through the history to make a comparison of that. The potential as it exists, the more paper you have, the tougher it is to draft.

They went to a computerized system. The fact that they went to the computerized system, I think, is because of the volume. One of the reasons is because the volume is such that it lends itself to that. There are a great number of design changes outstanding. There is no doubt about that.

MR. TERAO: Do you feel that the number of design changes that are outstanding, that are still in the manual system are accurate?

MS. WILLIAMS: We did not find any problems with the ones that were -- I want to make one distinction for the manual system.

When we went in and did our original review back in July of '83, everything was manual. So when we defined

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manual system, it was everything. And then they were in the process then, through their design change tracking group of bringing the database up to speed so that it could be merged with the manual system in DCC.

There were almost two parallel systems there for a while. Although the manual system of DCC governed for all drawings. Our original observations are written against a manual system, but for all drawings. Not for just the piping and pipe supports.

And then they went and merged the DCTG computerized system with DCC and then there were certain types of drawings still on the manual system, which are now referred to as manual. And those are the piping and the pipe supports. So the focus narrowed a little bit.

The problems we found in the original manual system were not with the piping and pipe support drawings, so much as some of the structural and electrical drawings.

MR. TERAO: With the structural and electrical drawings, were any of the problems related to the accuracy of the design changes?

MS. WILLIAMS: For the Phase I and II review? No, because for the walkdowns we did not find -- the only problems that we found with that were with the accuracy, were reflected in the observations as far as matching the drawings as-built configuration matching the drawing. The

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design control portion of the review was how well they track and what problems they are having with their tracking system in the DCC, where you are talking about accuracy of tracking and controlling the paperwork. Not so much accuracy technically of the design changes.

MR. TERAO: I'm speaking accuracy in terms of where the packages are complete. Were all of the design changes there? Were all of the latest drawings there?

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MS. WILLIAMS: With the exception of the one that we wrote the observations on, we felt that we did those on the ones where they were not complete, where the list did not match. And there were four observations on that.

MR. TERAO: If those are on the manual system, how would those inaccuracies be corrected before they are put onto the computer system?

MS. WILLIAMS: This gets into the process they are going through now of checking each CMC in each in DCA, since they are sequentially numbered. And verifying that they are outstanding against the appropriate drawings.

If they were incorporated, they are statused as being incorporated. The design verification has been completed. And just taking each one of those pieces of change paper with a discipline engineer who is cognizant of that particular type of drawing and checking that it is correctly logged and tracked within the DCC system.

I do not know if that is complete right now. It was ongoing at the time.

MR. TERAO: What would be the consequence if a package were not complete? Can it be corrected?

MS. WILLIAMS: In what sense? In the construction sense?

MR. TERAO: If they were to find a package that was not complete, they were missing design changes or latest

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drawings, what steps would be necessary to assure that the package then is corrected and accurate?

MS. WILLIAMS: I'm not quite sure I understand the question. They are going through the process of making sure that they are all complete right now. They are not referring to that.

MR. TERAO: You are saying that they are going through the process now. If they were to find one of the packages to be incomplete or inaccurate, missing design changes or drawings, what steps would then have to be made to assure that that package can be put out to the computerized system in a complete and accurate form?

MS. WILLIAMS: I would answer that by saying, the steps they are going through, which is checking piece of design change paper and making sure that it is complete to the package. They are making sure that drawing, number S-100 say, has all of the right design changes listed in the tracking system against it. And if they are incorporating the drawing, that they are so noted as incorporated.

MR. TERAO: Maybe my question is a little simple. I'm just asking, how do they correct a package that is inaccurate or incomplete. Is there a way to get a complete package that is accurate?

MS. WILLIAMS: Yes.

MR. TERAO: How would they do that?

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MS. WILLIAMS: They would do that at the culmination of going through this purging or validation process. What steps are they going through in that process?

MR. TERAO: Would they have to go back to Gibbs & Hill?

MS. WILLIAMS: To obtain a copy of that design change?

MR. TERAO: Yes, to get a complete, accurate package.

MS. WILLIAMS: We did not find that it was so much that they physically could not locate the design changes. It is how they were logged in the system that was the problem. They were physically there.

Whenever we wanted to request a CMC or a DCA we were able to obtain it.

MR. TERAO: My question is still, do you know if it is possible to get a complete package up-to-date, corrected with all of the latest drawings? Can they do that?

MS. WILLIAMS: They can do it now to the extent that that validation process is complete. They have to go through that process in order to make sure that they have accounted for all of the change paper. That is why I qualify the answer. I do not know if it is complete. If that is complete and they have accounted for every one of the CMCs and DCAs and DDAs and all of their old types of change

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papers, then yes you can go into the computerized system and get a listing, and a complete package then, if you want to ask for a hard copy of it from DCC.

I'm not answering your question?

MR. TERAO: You keep speaking in terms of validation as meaning that the package is accurate, the package is complete.

MS. WILLIAMS: Yes.

MR. TERAO: Let's go back to the question. Suppose they were to find a package that were missing design changes and drawings. How can they assure, what steps would they have to take to bring that package up-to-date? Can it be done?

MS. WILLIAMS: I think I see the difference. You're saying, look at a drawing and how do you know where to look for all of the outstanding design changes?

MR. TERAO: No. You know what the -- you might know what the design changes should be, and you could know that you are missing some, or you might know that you are missing a drawing. You may not know that you have the latest drawing.

How in the process then, would they get that package up-to-date?

MS. WILLIAMS: If you know the design change that you are missing, you would simply go request it. They are

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in the system.

MR. TERAO: You don't see any problems with finding a package inaccurate as far as having the latest drawings or all of the design changes, because you feel that it can be corrected by just going and getting whatever design changes are necessary?

MS. WILLIAMS: If you know what design change you need, you won't have so much problem finding it. That was our experience in our audit.

To me, the concern was making sure they accounted for all of the design changes for the person who does not know what design changes they should have as part of that package.

MR. TERAO: In your conclusion -- just on DC-0101 you said you have confidence that the newly developed computerized document listing is accurate, with respect to design changes outstanding against affected design documents.

I guess I still do not understand how you got the confidence that this computerized listing was accurate, if you found inaccuracies in the manual system.

MS. WILLIAMS: Our confidence is born out of going through and assessing whether they were conducting a validation process which would pick up all of the discrepancies.

MR. TERAO: I will stop at this point, but we

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probably have to discuss it when we get into the DCs --

MR.YOUNGBLOOD: Is that something you're going to be discussing further in your presentation?

MS. WILLIAMS: No, that would be the end of the design control questions, as it were in the letter, we can talk about any aspect you wish. I just took the letter, each question and summarized it.

MR. BACHMANN: Off the record.

(Discussion off the record.)

MR. BACHMANN: Back on the record.

MR. SHULMAN: Can I try one more shot at clarification?

MR. YOUNGBLOOD: I think the question, on the last question you said you were going to cover that. I think that is exactly what we want to cover, is if the uninitiated were coming in and checking the system, or someone was coming in to make sure it was up-to-date, what are the things that -- how would they know all of the things that they are supposed to validate? And how would they know that something was missing? And how would they correct that?

MS. WILLIAMS: To try to rephrase the question then, if an auditor, an outside auditor, were to come in today and to check the system --

MR. YOUNGBLOOD: Either that or someone who is

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just doing the job checking.

MR. BURWELL: He wants to inspect something. He's going to go get a package of drawing or whatever he needs to inspect it. The question then, what has he got in his hand. Perhaps he did his inspection and now the system is going in, moving into its validation procedure.

Nevertheless, his inspection record --

MR. YOUNGBLOOD: Let's back it up one step and say we are transferring this from the manual system to the computer system. What kind of criteria do I have to go by that picks everything that is supposed to be a change? And how is one assured that everything that is supposed to be changed and transferred, is indeed transferred to the computer system?

Is that getting it --

MR. BURWELL: That is a little bit of a separate question.

MR. YOUNGBLOOD: But it is preliminary to the other.

MR. BURWELL: Preliminary or following, either way.

MS. WILLIAMS: Tell me when I go off on the wrong track here. If I were going in --

MR. YOUNGBLOOD: Is there someone back of you that wants to chime in on any of those questions?

MS. WILLIAMS: I think I'm pretty familiar with the system. I would go in and check this validation process that is going on, that was not completed when we were there. And maybe I can explain what that process is and see if that helps, go through that one more time, because I think I went a little quickly over that.

The only way -- because of the number of design changes outstanding, to ensure that they have correctly accounted for each piece of design change paper is to go through them one by one and make sure that they are assigned against the appropriate drawing. The thing that enables them to do that is that they are sequentially numbered. So you can be ensured that you account for each one by going one, two, three, four, or in blocks of 100, or however you want to structure that program.

In carrying out this check which, it is our understanding they are doing for the CMCs in the DCAs, they have assigned an engineer in the DCTC group who is cognizant of that discipline. So the electrical drawings would have an electrical engineer who is checking to make sure that it is an electrical design change, that it is applicable to that drawing, and whether or not it is incorporated in a determination as to whether it has been designed verified.

And then the paperwork follows where they update the database if that is necessary. So to go back here a

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minute. Knowing that they have sequentially numbered design changes, they parcel them out by discipline. This check is conducted to make sure it is allocated against the appropriate drawing, to make sure there is any cross-references to other drawings that may be affected. And that information is then updated into the database.

So I think that what you want to do is make sure that in fact that activity is either completed or being conducted, that there is a good mechanism that is working for getting that entered into the database. And only be going through them sequentially can you tell that they have all been incorporated. You could do it with a technical person if you wanted to, with an auditor.

Before I pursue the question any further, does that in any way set the stage for what process is being conducted to assure the completeness of the packages?

MR. TERAO: It basically tells me that there is a processing place, yes.

MS. WILLIAMS: So you might want to go back and check that process.

MR. YOUNGBLOOD: Is this something that is being checked in one of your other phases that were doing for the hearing?

MS. WILLIAMS: I guess there is some discussion on firming up the scope, and maybe today's meeting is part

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of that.

MR. TERAO: Probably a lot more difficult task than just assuring that the process is there is to assure that the process is working. Did CYGNA look into that aspect?

MS. WILLIAMS: We really came in when that was just starting to happen. We found discrepancies, and then we wanted to find out what they were doing to resolve these discrepancies. We had a similar question to you, which is we found these omissions from your tracking system, or complex between what a control document holder thinks are the outstanding changes and what your central DCC system thinks are the outstanding changes, so how can you assure us that this will be straightened out in an appropriate manner?

So DCTG was not originally part of our audit. This was actually an expansion of our audit that we got into, looking at how that system worked. And we became, to the extent that I have explained it today, familiar with that system because we wanted to assure ourselves that appropriate actions were being taken.

But we did not get into, say, auditing that activity as part of our review.

MR. TERAO: So it appears that your conclusion, your confidence that the newly developed computers document listing is accurate with respect to design changes is

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based on the fact that the system is in place? Not necessarily that the system is working accurately.

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MS. WILLIAMS: Yes. And then there is the as-built walkdown, which is our second check, so it is twofold.

MR. YOUNGBLOOD: That is on the last complex area that you're doing that?

MS. WILLIAMS: Yes.

MR. BURWELL: Yes, that is on the spent fuel pool system.

MS. WILLIAMS: We are proposing to do one on the component cooling water system for Phase IV.

MR. TERAO: I have no further questions on this particular issue, unless anyone else has any.

MR. PIGOTT: Do you have your answers to your questions? Are there any outstanding questions? If there are, we want to stay with it.

MR. TERAO: I understand what Nancy has said.

MS. WILLIAMS: Moving on --

MR. BURWELL: Before we go away from that, I would like to go back for just a moment to the question that I had earlier on the inspector.

You showed the process of -- validation process that they are going through, ultimately leading to the Bulletin 79-14 response.

Now in the course of all this, there seems to be a number of ongoing inspections for conformance of the

mgc 4-2

piping supports to the design documents.

Do you remember any incidents in which you concluded that the spent fuel pool system was not in conformance with the drawings and then went back and later found that there was a document that was found to relate to this, that did bring the system in conformance with the complete package?

In a sense, I am asking you, did you find incomplete packages when you did the review of the spent fuel pool cooling system walkdown?

MS. WILLIAMS: No. Our observations were more that we had all of the change paper and we had the drawing, but that we needed to go and ensure that the installation, for example, permitted end-for-end reversals of snubbers or it was permissible to have a certain percentage void under a baseplate or things like that, but no violations of the fact that it was not in conformance with the drawing or the change paper, but more that we ended up looking at the specifications to make sure that it was -- anything that we were seeing that we thought was in any way a potential violation -- was covered in specifications. It was just the nature of the things that we found. We did not find dimensional disagreements where there was no change paper that addressed it or anything of that nature.

MR. BURWELL: Fine. Thank you.

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MR. YOUNGBLOOD: Any further questions?

(No response.)

MS. WILLIAMS: This question pertains to the RHR system, which was the system we conducted our design review on. Specifically it was a pipe stress question.

We had an Observation PI-00-01. We have been asked to provide an explanation as to whether butt welds on the straight sections of the pipe, precisely three and four-inch Schedule 40, comply with all of the current code requirements.

To give a very brief history of that one, I am going to turn to the observation for a second to show how three and four-inch pipe was zeroed in on, and then I will come back to our response on that.

(Slide.)

This is just a slide of PI-00-01 where we did an observation. Gibbs & Hill did not specify any weld mismatch in determining the stress factors. Our resolution of that is shown on Section 2 of Attachment A to that observation where we discuss a Gibbs & Hill response to certain size pipes where they cite the -- as contained down here, the Moore paper where it says, "A mismatch should be considered for stress indices only for T less than .237 inches." And then we go on to discuss thicknesses greater than .237 inches where Gibbs & Hill did use the

mgc 4-4

appropriate stress intensification factor of 1.8 for thicknesses greater than .1875 inches. So we have narrowed down the range there, which turns out to be sizes three and four Schedule 40 piping, which is specifically the question in the letter.

(Slide.)

Later codes for Equation 8 and 9 use stress indices for the primary stress check. We have what Gibbs & Hill implied with later codes, the later code case. They turned out to be less restrictive on the butt welds, and I am going to show that comparison for Equations 8 and 9 right now.

(Slide.)

The top equation is a code of record. The later code equation is the second one where we substituted the values of B_1 and B_2 for butt welds. By substitution you can compare the two equations, and knowing that .75i must be greater than or equal to one, the equation for the later code case is 1, and also that the allowable for the later code case is $1.5S_H$ as opposed to $2S_H$, we have concluded that for those two Equations 8 and 9, that the later code case is less restrictive than the code case that was employed in the Gibbs & Hill design for Equations 8 and 9.

For Equation 10, in the thermal condition, we do not believe that an appropriate stress intensification

mgc 1-5

factor was used, where they used 1 instead of 1.8; however, it is our belief that the moments on those straight runs of pipe are low enough, such that you have sufficient margin that it is not going to be a design concern.

MR. TERAO: How did you conclude that the moments are lower in straight runs?

MS. WILLIAMS: Based on our review of the stress analysis for the RHR system where they were low, and then where butt welds typically occur on the straight runs, which is in regions of low moment. That is our experience.

MR. TERAO: You went back and looked at piping stress analyses, determined where the butt welds would be in straight runs, looked at the moments at those points and compared them to the moments in the other parts of the system?

MS. WILLIAMS: As you approach the hub of our transition joints or something like that, that SIF is going to govern. We did have the information on the RHR system where the moments were low enough on the straight runs where we believe we will have butt welds which are not governed by SIFs for transition joints, elbows of similar types, and thought they were sufficiently low enough to alleviate any design concern there may be for having used an SIF of 1.

That is based on the fact that butt welds

mgc 4-6

typically occur on long straight runs, and if they occur near the elbow, then the SIF of the elbow is going to govern.

MR. TERAO: Did you actually compare the moments at the butt welds in the straight piping with the moments at elbows or Ts, reducers?

MS. WILLIAMS: I do not have a chart that shows that comparison with me. But yes, that was certainly part of the basis by which you would be able to make an assessment like that, is that we would go in and look at the moments. I did not bring a chart along that shows you what that comparison is on the RHR system.

MR. SHULMAN: We can have such a chart, Nancy?

MS. WILLIAMS: We can develop that by looking at the stress analysis. We have to get the documentation.

MR. TERAO: Can you tell from the isometric where butt welds would be in straight piping?

MS. WILLIAMS: That is based on our experience. You would have to go to the full piece drawings.

MR. BURWELL: Would that give it to you? The reason for my question is that typically you have got to fit a pipe up. You weld the one end, and then you have got to openly connect this pipe over to another piece of equipment.

Don't they typically make a short spool piece insertion in order to lengthen a straight piece of pipe to

mgc 4-7

make this fit-up? Would you not have to go to either a visual inspection or to some as-built records, and I'm not sure that even as-built records would pick that up, would it? Do you know?

MS. WILLIAMS: You would have to do what you said. You would have to go in and do that check to make sure that our experience is correct. You cannot do that by looking at the analysis.

What we have done is narrowed it down to three and four-inch piping. If you want to go in and verify that and close the loop on this, which is certainly possible, then what you would do is to go in and check the location of the butt welds. You would have to find out what the most accurate piece of documentation is to provide you with that information.

MR. TERAO: My concern is still that the RHR piping is not three or four-inch piping.

MS. WILLIAMS: That's right. We did not look at three or four-inch piping as part of the RHR. This observation was based on the RHR system, but it is a much more general observation, which is why it is labeled the 00 series. We have narrowed it down to three and four-inch, but our conclusion that we are discussing now is only based on our experience that we don't believe that is where the butt welds are placed.

mgc 4-8

What we would have to do is go close the loop by looking at three and four-inch piping and ascertaining whether that is true or not.

MR. TERAO: Are you intending to do that?

MS. WILLIAMS: We have been discussing doing that as part of these three, yes.

Given the somewhat changing environment in terms of level of detail and making sure that we assess all of the generic issues in an appropriate manner, I think that it would be appropriate to close the loop on this, yes.

MR. TERAO: Going back to the Equation 9, on the primary stresses, you made a statement that the code changes in the winter of '81 addenda allowed a higher allowable stress.

Would the minimum wall thickness at the butt welds themselves be covered by the increase in allowable stresses?

Maybe I should rephrase that. Did you look at, in addition to the mismatch ratio at butt welds in straight piping, did you also look at the minimum wall thickness allowed for the same butt welds when counterboring of the pipe is required?

MS. WILLIAMS: I would have to check that.

MR. TERAO: The question is, when a pipe is counterbored at the same location as straight pipe, when

mgr 7-9

it is counterbored, there is usually a tolerance given for the minimum wall allowed.

What is the definition at Comanche Peak for the minimum wall allowed in counterboring the pipe? Would that be the minimum wall per the 12 percent, 12.5 percent criteria, or would it be the minimum wall per NCND 36/40?

MS. WILLIAMS: I think the best way to handle that is, I can make a phone call at the break. Unfortunately, John Minichiello could not be here today, and he is the person to ask that question of. I will make a phone call and see if I can get the answer immediately.

MR. TERAO: That would also affect the stress intensification factor.

MS. WILLIAMS: Let me ask John that before I try answering something like that.

MR. LYNCH: I would like to ask a question to understand your topical approach.

While you concede that the stress intensification factor was improperly used for piping of certain thickness, is your basis for finding this acceptable because the stress level was low there?

MS. WILLIAMS: For the three and four-inch piping Thermal Equation 10? Our discussion of low stress levels or low moments only pertains to Thermal Equation 10 for three and four-inch piping, Schedule 40.

mgc 4-10

MR. LYNCH: What assurance do you have that other piping systems that you did not look at, that the stress level was comparably low so that the use of an inappropriate stress intensification factor would not be acceptable there?

End 4

MS. WILLIAMS: To close that loop, we have to go back and look at three and four inch, Schedule 40 piping and check that the location of the butt welds is such that that is not a concern. That the moments are low enough that that is not a concern.

MR. LYNCH: I have a problem philosophically. What you're doing is checking design process. Are you saying that though you may find something in error in the design process, you're buying off on it because the stress level is low?

MS. WILLIAMS: We are buying off on it on two things. This particular system is they were low, so that is one example of it. But it is our experience that that is not going to be a problem. And that is part of the judgment that we made. We did not believe it was going to be design concern, that it was going to affect the health and safety of the public, or that it was going to truly affect the outcome of the stress analysis.

To close the loop though, just to make sure that our judgment is correct, that would be the path we would take.

MR. SHULMAN: In Phases III and IV, we would look at other samples of spot checks, since you have -- if they are that low, we are talking about fairly low stresses. Well below half of allowable. That is what we have to

5pb2

confirm, particularly on III and IV. Specifically for three and four inch pipe.

MR. TERAO: The stresses may be half of the allowable because it is based on a stress intensification factor of one. If you use a stress intensification factor of 1.8 then you are close --

MR. SHULMAN: But we have to confirm that it is significantly less than half of allowable, otherwise it would be .9.

MS. WILLIAMS: I would like to make one other note. There are cases where we do expand the scope and go outside of the system that we looked at. That happened in several instances in the observations, and even in items on check lists. I don't want this to be construed as indicative that we never go and expand the scope, because we do.

In this case we did make the judgment that we did not feel it was a problem. If we judged otherwise, we would have gone in and looked at it. What we're saying here is we closed the loop by looking at it for the three and four inch, Schedule 40 pipe.

MR. WEINGART: Comparing the internal stresses, we are talking about the stresses that were typically that low in the system in the RHR that we looked at. Our judgment was based on the high thermal stresses will occur at the nozzles, elbows and fittings. At those points they did use

5pb3

the proper SIF.

MR. TERAO: It may be true that the high thermal stresses occur at nozzles and fittings, but the stresses due to seismic may occur in the middle of a simply supported beam.

MR. WEINGART: That is correct. However,in that case you would be going to equation 9, in which case you are back to using stress indices as allowed by the later code, which shows by this argument that that is okay.

This slide shows that the only point of concern would be for equation 10, which is your secondary stresses, in which case you still have to use the SIF, which is where the problem was.

Our logic further followed that, typically for large thermal stresses, which we use in evaluating equation 10, those are typically nozzles, elbows, fittings.

MR. SHULMAN: That is the judgment that we have to confirm, is the differences between equations 8, 9 and 10, and there is a confirmation that the stresses are indeed significantly lower for the -- for all cases on three and four inch piping, where they omitted the appropriate stress intensification factor.

MR. TERAO: And CYGNA is going to confirm that?

MR. SHULMAN: Yes. We agree in that one case, in this observation as part of Phase III and IV, we have to

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confirm that that is in fact true.

MR. TERAO: Are we going to get an answer from Mr. Minichiello today?

MS. WILLIAMS: I will try to call him today.

MR. TERAO: I have no further questions on this observation.

MR. BACHMANN: We will take a five-minute break now, go off the record.

(Recess.)

MR. BACHMANN: Back on the record.

MR. TERAO: I talked to Mr. Minichiello and clarified our concern regarding the minimum wall thickness of pipe. I basically asked him at girth, butt welds between straight piping, is the minimum wall allowed after counter-boring of the pipe, is it the minimum wall of minus 12-1/2 percent tolerance? Or is it the minimum wall NCND 3640 of the ASME code?

The reason for the question is that the factor of one is permitted when the tolerance, minimum wall tolerance is within 12-1/2 percent of the code -- 12-1/2 percent of the nominal wall thickness. But stress intensification factor of one is not permitted if the minimum wall is defined as that minimum wall as calculated per NCND 3640 of the code, which could be much less than the nominal wall minus 12-1/2 percent.

In other words, if the minimum wall at counterbore is the NCND 3640, then use of a higher stress intensification factor of one is required.

MR. YOUNGBLOOD: He is going to follow up on that then?

MR. TERAO: Yes. He understands the question, and he will review the specification, the piping specification. I believe it is MS-200 spec.

MR. YOUNGBLOOD: Does that complete everything on question 2 then, at this stage?

(No response.)

MS. WILLIAMS: Question 3, dealing with pipe stress again on the RHR system, refers to Gibbs & Hill's use of the 20 percent increase in allowables for welded attachments.

(Slide.)

If you look at the problem in light of later codes and code cases for straight pipe, you arrive at the following conclusions. That in the case of SA106B piping, the Gibbs & Hill allowable is less than the current Code Case allowables.

In the case of stainless steel 304 and 316, the Gibbs & Hill allowable is also less than the current Code Case allowables. When you get in the 304 and 316 stainless, for temperatures greater than 400 degrees, then there is some

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difference between the Gibbs & Hill allowable and that of later Code Cases.

I'm going to show that on a chart right now.

(Slide.)

Referring to the 316 and 304 stainless, looking across to the comparison of Gibbs & Hill and the code, you will see for temperatures of 400 degrees, in the case of the 316, that the Gibbs & Hill is slightly greater than that of the current Code Case allowables. Going and looking at the 304 stainless for condition, which on this chart shows us 650 degrees, but actually is 550 if you read off of the charts. There is also a slight increase, or difference, between the current Code Case allowables and that which Gibbs & Hill uses.

Now we looked at that, and we looked at the margins where the welded attachments on the RHR system, and the worst ratio of allowables of the actual stress levels to allowable was in the neighborhood of .56. We had almost a 50 percent design margin for the welded attachments on the RHR system dealing with straight piping.

So we felt that those margins were certainly outweighing what is less than a 10 percent difference in the Gibbs & Hill allowable versus the current Code Case allowables. On that basis, we made a judgment. We felt there was no design impact.

In going on to elbows, which are a much more limited application, at the Comanche Peak plant. If you go through a derivation of comparing the current Code Cases to that which was employed in the plant, you are going to find that there is not this significant margin -- let me rephrase that -- the potential exists that they exceed the current Code Case allowables.

And our feeling was that the stress method, the large stress method was sufficiently conservative to outweigh the differences that you would get in looking at the elbow welded attachments. It is really a two-fold reason.

One is we felt the method was conservative. And two, that there is a very limited application in welded attachments to elbows at Comanche Peak.

MR. TERAO: Perhaps the welded attachments on the RHR system were found acceptable using this 20 percent increase. Have you considered what the effects of the welded attachments could be on other systems, other than RHR, when the 20 percent increase is allowable?

MS. WILLIAMS: You would be able to narrow that with the case of the stainless steel, which is over 400 degrees, and we consider that in the sense that we felt that it would not be a problem.

To close the loop on that again as with question 2, what you want to do is go back and look at a further

5pb8

sampling of welded attachments, using that material in systems that exhibit characteristics running at temperatures greater than 400 degrees. This is another case where we made a judgment. It was a judgment based on our experience and our understanding of the type of evaluations that were done there.

If you want to go back and demonstrate that that was an accurate judgment, you would have to look at that situation. I would narrow it down to just looking at those specific parameters.

MR. TERAO: My concern is, on the RHR system it is relatively low temperature system. It may not see too many pressure or thermal cycles. Whereas systems such as main steam or feedwater sees many large numbers of pressure and thermal cycles that can impose local stresses at the welded attachments.

And these stresses generally are not considered in the analysis. They are Class II and III pipings, so there is a certain amount of uncertainty in the actual stresses for these types of systems.

If a 20 percent increase were allowed on those systems, and if pressure cycles, thermal cycles, thermal gradients were neglected, and if there was a small design margin, how could that be accepted?

MS. WILLIAMS: Well, first, again I would narrow

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it down to the specific case. And I recognize that the viewgraph does not provide the detail, but we went through a similar comparison as we did in question 2, which is two pages of calculations, which I did not put on a viewgraph, which we can make available to you.

To make a comparison, and to narrow it down to the situation where we think that your only concern would be with the stainless steel and the temperature range greater than 400 degrees.

MR. TERAO: That is not my only concern. One concern of course is the stainless steel greater than 400 degrees. But even in carbon steel piping, where you can have large numbers of pressure and thermal cycles that are not explicitly accounted for in the design, it is basically covered by NC-3645, which states that localized venting should be minimized.

It does not say that you have to do an explicit analysis. Now for those systems where you do see large pressure and thermal cycles that could result in large local stresses in the piping, increased allowable added to the uncertainties in those loadings, may not be acceptable.

MR. SHULMAN: I am a little confused here. Are you questioning the 20 percent increase in allowable? Or are you questioning later code versions? I think part of Nancy's problem is, were Gibbs & Hill to use later versions

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of the code, the only case where those allowables that Gibbs & Hill use would exceed the allowables of later versions of the code would be in the case of 304 and 316 stainless steel. And only when the temperatures were above 400 degrees. Above 400 --

MS. WILLIAMS: Above 400.

MR. SHULMAN: I am confused as to whether you agree with that premise, or are you disagreeing with that?

MR. TERAO: The Code Case itself that you are referring to is N-318. Now that Code Case goes into varying detailed analysis of the different loadings at a local welded attachment. It covers not only the external loading, but the internal thermal loadings.

Not only the primary, but the secondary and peak loadings. If that has been done, then there would be no concern. The question is whether or not a general increase of 20 percent, not knowing for certain what loadings were considered, may not give you the same safety margin as using the Code Case.

MR. WEINGART: Our comparison was not necessarily even related to the Code Case. This comparison was to the later code itself, where we compared the allowables that Gibbs & Hill had used, versus a later code, and then added in the large stresses that were calculated by Gibbs & Hill.

end 5.

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MR. TERAO: I don't think that would be appropriate. You are referring to the NCND-36 equations? Those only calculate pressure membrane and general ending stresses.

MR. WEINGART: Which is part of what the Code Case specifically refers to, 318. And in 318 you will see the analogous equations, where they add in the 318. They add the membrane bending stresses to the stresses that you find in the equation from the code 8, 9, 10, the same allowables.

Now your question, I'm not quite sure I follow how your question relates. You are saying there is additional loadings which should be applied.

MR. SHULMAN: To use 318, the stress analysis has to be treated differently. I think that's what you're saying. You have to consider other stress distributions.

MR. TERAO: Thermal gradients. I think the general concern is why was the increase in the ASME code allowables used? Why was it permitted?

MS. WILLIAMS: That was our question to Gibbs & Hill, as well. It is my understanding that it was a decision that was made that they felt was adequate or appropriate at the time. And then what we set out to do was to assess whether we were comfortable with that decision, that they were using in their design.

We felt that it would not be a problem, and accepted

61b2

it on that basis. I guess what you are saying is that you still have a concern as to whether that was appropriate.

MR. SHULMAN: The real question is the manner in which stresses were calculated. Is it conservative relative to what Code Case 318 requires?

MR. TERAO: I guess what I am saying is when the ASME code recognized that higher stresses are needed for -- to account for local welded attachments, a good deal of engineering and analysis and a rational basis was developed in order to come up with the Code Case and 318, whereas the approach apparently Gibbs & Hill used, is they just felt that 20 percent increase was acceptable.

Now it is proved that 20 percent increase is not acceptable for all piping, all materials. Knowing what we know today, with the Code Case, how can we accept the 20 percent increase that really had no justifiable basis?

MS. WILLIAMS: We went through a similar line of questioning when we wrote up the observation. I guess what we are getting down to now is do we agree that it is acceptable, in light of current day practices, and you have some specific concerns on that, that this does not address -- that our response does not address, or that you disagree, even with our comparison.

So far, on this response, I want to make sure that we are talking the same concerns here, so we can focus in on

it. We thought it was a concern, too. We did not think there was a basis for it. There was some room for interpretation of the codes, as they existed back then. We had a conference call, telephone call, with Gibbs & Hill, where they explained their logic behind that.

We thought about it some more, to discern whether we thought it was really a problem, given that we had a 50 percent margin in the system and given that we felt that there was only specific concerns, such as in the case of the stainless steel. We felt that there was no ultimate design impact on using that.

And now we are discussing that basis, whether that is an adequate basis for saying that is acceptable.

MR. TERAO: The main concern is reaching the pressure boundary of the pipe. There are many ways that an engineer can meet the intent of NC-36.45, in order to minimize the excessive localized bending in the pipe. One can use pads, saddles. One can avoid welded attachments that can induce localized bendings, such as shear lugs would intend to induce shear on the pipe rather than stantions, which can induce the localized bending into the pipe.

And I guess the philosophy is if shear lugs break, it would fail and shear, and it would not necessarily breach the pressure boundary of the pipe, whereas welded stantions to the pipe -- if that fails, it would induce a localized

bending into the wall of the pipe.

So the intent of NC-36.45 can be met by using -- shall I say -- good engineering practices and recognizing what you are trying to avoid. Do you find that these kinds of engineering practices were used by Gibbs & Hill?

MS. WILLIAMS: They used the SYLNOZ, S-Y-L-N-O-Z, program, where it was deemed necessary that they use pads. It probably does not address the concern of trying to avoid the use altogether, the use of welded attachments altogether, which I think I hear you saying.

MR. TERAO: I wonder if there was a reasonable basis for either using or not using pads on piping, where local stresses can be significant? Was there any screening done by Gibbs & Hill, for example, limitations on temperatures of the pipe, pressures of the pipe, where a certain type of attachment was or was not allowed? Is there any kind of guidance of that given in any other procedures or specs?

Let me see if Lee can answer that.

MR. WEINGART: What we found was that it was totally based on the results of adding the SYLNOZ stresses to the Code equations, it would increase the allowables. And if they pass, that there was no further requirements imposed.

Now if I understand your concern correctly, you're saying that just adding those stresses to the equations 8, 9, and 10, and showing that those stresses met the allowables,

would not be sufficient.

MR. TERAO: What I am saying is perhaps in the RHR that may be appropriate. The thermal gradients and the number of cycles are relatively small. The use of that procedure, for example CYLNOZ, only calculates external loadings and not internal loadings. The use of that program may not be appropriate, for example, in evaluating the main steam or feedwater pipe or the thermal gradients can be quite large.

MR. WEINGART: You do not consider for Class 2 and 3 piping.

MR. TERAO: The reason for not considering, for not having to have an explicit analysis, is because most Class 2 and 3 pipings don't see the type of pressure and temperature cycles that Class 1 piping sees. The main steam and feedwater sees considerable and significant numbers of cycles throughout the life of the plant.

One should use a little engineering rationale there, in order to determine whether those stresses should be calculated. Just because the codes -- the Code does not say don't calculate, the code only says that one should avoid excessive localized bending and thermal gradients in the pipe.

MR. SHULMAN: We do not know, at this point, what they did on the main steam and feedwater.

MS. WILLIAMS: The main steam is a subject for

our Phase III review. Correct me if I am wrong, but I think that they minimize the use of welded attachments on the main steam system. That's not true? Okay.

MR. WEINGART: If I understand what you are saying, you are not limiting your argument to just welded attachments. It is piping analysis in general for high temperature lines, or lines that will see significant temperature transients or pressure transients.

MR. TERAO: The overall concern is have welded attachments been properly considered? And is this 20 percent increase appropriate? My position, at this point, is it may be appropriate for some piping systems, but other piping systems it may not be appropriate. Now you have looked at -- CYGNA has looked at the effect of the 20 percent increase on RHR and concluded that it does not impact RHR.

Our question is how did it impact the other piping systems?

MS. WILLIAMS: We might be able to pick up on that specific concern on Phase III, since we are looking at the mainsteam. It might be an appropriate place to evalute that.

(Pause.)

MR. YOUNGBLOOD: We were just discussing what your responses will be, with regard to these question. Obviously, some of them will require some response from Phase III or Phase IV. Phase III or Phase IV, I believe, are being done

basically in response to the hearing board, and so forth.

Do you plan to give us these responses separately for the IAP, and not as part of your package that you are doing for the total Phase III and Phase IV?

MR. PIGOTT: Are you referring to the specific questions being asked today?

MR. YOUNGBLOOD: Yes.

MR. PIGOTT: We can answer your specific questions in the context of Phases I and II without requiring that they be rolled into whatever.

MR. YOUNGBLOOD: You may roll them into that report, but we would like a separate response.

MR. PIGGOTT: The timing may be another question. I don't know if we are in a position yet to give you those answers.

MS. WILLIAMS: Not quite yet. We are still evaluating Phase III.

MR. SHULMAN: What would the time frame be, given that they are part of the Phase III and IV evaluation?

MR. YOUNGBLOOD: We cannot finish our report until you give us these responses. The timing is sort of --

MR. BACHMANN: There were certain specific responses that were requested and that were referred to Phase III, possibly Phase IV. Those very specific answers, if they can be pulled out and forwarded, as Mr. Youngblood said, are

necessary for us to complete the Staff's evaluation, the Staff's review of the IAP. And if at all possible, we would like to get those -- obviously -- as soon as possible. We would appreciate being made aware of any of these reponses, and of course we will all have the transcript so we can see exactly what they were that will be delayed, or that could not readily become available within a reasonable period of time as soon as you are aware of them, and let us know. And see if there is a possibility, if they can be worked around or something.

We definitely would like to wrap up this review. Some of these, as far as I know, are completely indispensible to completing the review.

MR. PIGOTT: We will have to look at the questions and determine how fast we get the answers. As we get to the answers outside of Phase III and IV certainly.

MR. YOUNGBLOOD: The reason I said that is I would expect that to take a little longer than maybe pulling the separate ones out. It is -- we are certainly interested in Phase III and Phase IV.

So far as the IAP is concerned, we do not have to have all of that.

MR. PIGOTT: You do need these for this particular phase of your review?

MR. YOUNGBLOOD: Yes.

(Slide.)

MR. BACHMANN: Off the record.

(Discussion off the record.)

(Recess.)

end t6

MR. BACHMANN: Back on the record.

MS. WILLIAMS: Cable trays, item four.

(Slide.)

This is an apparent omission on one of our tables contained in the design criteria. It was an appropriate question. It was omitted. It was not because we did not perform the review using that criteria. It just was not filled in so we have provided, and this will show up in a revision to the design criteria, what the safe shutdown column should read using the 1.6 bump factor in allowables.

MR. BACHMANN: Will you provide this as an official amendment to your report?

MS. WILLIAMS: When we issue official Rev. 0, yes. It is in one of the errata sheets that will be provided.

MR. RINDALDI: In your testimony, you address this number, Walsh No. 5, question. I was given some papers on your testimony, on cable trays. You addressed the Walsh No. 5.

My question is mainly when you compute --

MR. WILLIAMS: Which part of Walsh 5?

MR. RINALDI: The attachment that you have, page one of one, for example, here. Let me ask a general question. I don't think you need to look at numbers, Nancy.

Basically the factor of safety that you use in the computation for the bolts, it is related to the same load

factor that you have, the 1.6 that we are talking about right now. You alternate between factors of 3, 4 and 5 and it is not clear why you keep on changing and 7902 recommends 4 and then for OBE you use 4, other cases you use up to 5. I don't think that this point is clear, what was done or what you have accepted.

MS. WILLIAMS: We will start with the anchor bolt safety factrs, which is the only thing that that would refer to.

MR. RINALDI: The 1.6.

MS. WILLIAMS: That does not apply to anchor bolts. That is the key and really part of Mr. Walsh's question is whether 1.6 is a bump factor allowable for the SSE condition in using the structural design.

You look at the chart and when you get down, the bump factors on anchor bolts, you will find that there really are none. You have built in safety factors that the manufacturer requires if you follow his installation procedures, which give you permissible capacities for the bolt. That is when we start discussing safety factors of 4 and 5.

Now, Hilti, when you look at their table for capacity, built into that number is a safety factor of 4. Gibbs & Hill originally started doing their design using safety factors of 5 in some cases, but that is not required.

7902 addresses various types of anchor bolts where the sleeve pipe inserts require safecy factors of 5. Hilti's requires safety factors of 4, which is in accordance with the manufacturer's manual and they only use Hilti's in the case of the cable trays. So you can forget about the safety factor of 5 being required for anything because it did not use a sleeve type redhead insert.

The fact that Gibbs & Hill used a factor of 5 for some parts of this calculation, that is fine but it is not required.

So a safety factor of four refers to Hilti type anchor bolts, expansion -- concrete expansion type anchor bolts.

This calculation here on Attachment W-2 is an assessment of what safety factor they really have in their bolts, using the type of design approach that they do on the cable trays.

Now that is another subject.

MR. RINDALDI: I would like to refer you to a specific part. You have page one of six, Attachment W-5-3. You have CYGNA's approach at the bottom of the page. Maybe if you explain that sentence.

MS. WILLIAMS: I have to put it in context, unfortunately. I will try to do that in an overview type manner.

There is the OBE and the SSE condition that you designed the cable trays for prior to -- and this is shown on Attachment W-5-2. It is just a one-sheet attachment.

They went through and basically normalized those equations so that they only had -- they picked the worst case between OBE and SSE and they did their design to that case.

What this sheet on W-5-2 is, a reflection of how they went through and assessed what that worst case was.

So now they have chosen what the governing loading condition is and they use that throughout their design but now inherent in doing this is the fact that you are allowing a bump factor of 1.6 in your numbers.

Now you have taken and compared the OBE and the SSE. The fact that you are comparing the SSE, you are acknowledging that you are allowing the 1.6 bump factor in your allowables for that condition, but anchor bolts are not allowed at 1.6 bump factor.

That is where we get into the next attachment, which is, "well, how important is this to the design?" Was that an omission? Was it really a concern? When we were up there doing the review, we stumbled on this as well, just as Mr. Walsh has in this question.

Then we went back and we found out that in fact Gibbs & Hill had addressed it back in 1979 as well. There were internal memorandums on it. We did our own calculations

here to make sure that we agreed with what they did. This attachment, W-5-3, is a summarization of our calculations where we went back and checked whether we think the anchor bolts are okay given using that design approach of normalized or governing loading conditions.

MR. RINALDI: I understand the general statement. Can you addresss specifically the three with the four, how that comes in? I just looked at this during the meeting.

MS. WILLIAMS: In the middle of the page there?

MR. RINALDI: Through all of the computations on the following page.

MS. WILLIAMS: We are checking to make sure that the anchor bolts, whether or not the anchor bolts meet the required safety factor of four given that approach. The safety factor of three is what we agree would be acceptable for the SSE condition and we went through and did some checks and discussed it with the manufacturers and evaluated those conditions. So 3 and 4 refer to the anchor bolts, 4 being what is normally required, 3 being a minimum that we would think was allowable and we wanted to set out to see if they met the 3.

MR. RINALDI: What is the basis for accepting the 3? Why do you determine that it was an acceptable number? A minimum acceptable number?

Is that document anywhere?

MS. WILLIAMS: MS-129-4, I don't believe we included that here. No, we did not include this as part of the response. I do not think I sent it out.

MR. RINALDI: I have not looked at great depth. I just looked at it this morning. This is one of the questions if possible I would like to be clarified on, MS-129-4 that you indicate.

The other thing is you also attached some report, which is Attachment W-5-4. It refers to seismic testing of electric cable support systems. I believe this was some research work done to qualify various cable trays. The second page to your attachment, figure 1, shows some configuration of typical cable trays.

Are these pretty much the same as what we are talking about, the Comanche Peak site?

MS. WILLIAMS: We are relying on this paper to be clear. This is the damptin values. John, do you want to comment on that?

MR. RUSS: I have to check -- if you give me some time. They did use different types.

MS. WILLIAMS: There are several papers we did not include here. We put this in as a sample. It is our belief, based on the various test reports available in the industry, that using the damping values, the cable tray damping values, can be very high.

MR. RINALDI: I understand your point.

All I am trying -- since this is an attachment to your testimony. I wanted to make sure that there was a real solid tie between the field use of the cable trays and the one we referred to in the document. That is what I was trying to do by my question.

MS. WILLIAMS: I understand your question, but I would point out that there is more of a generic discussion on our part. We will check on that.

MR. RINALDI: Going back on the cable trays, relating to the damping value, I guess the big question is the damping factor related to welded structure versus bolted.

It is a fact, I understand, that these trays are clamped down to the brackets and the welding is only for the trays themselves, only the weld applies to the trays and not to the connection in the trays and the supports, right?

MS. WILLIAMS: Basically that is true. They have various clamping configurations that I think when you were at the review we had the catalogue out. The welding is basically within the members of the support structures themselves.

MR. RINALDI: Out of the trays are clamped and bracket support?

MS. WILLIAMS: Yes, we look at it as a system because of that.

MR. RINALDI: Any welding used in the brackets is minimum? You indicated there is some welding of bracket supports that does exist at the site.

MS. WILLIAMS: It is the bracket to the tray -- the bracket to the support, not the bracket to the tray. They have those fiction type bracket connections with the tray and they also have bolted connections between the tray and the support. Those are the two types of configurations I believe we found in our review.

MR. RINALDI: Is it possible to obtain a sketch showing what the welding exactly -- what it looks like, what we're talking about?

I want to be very clear, if possible.

MS. WILLIAMS: It is on one of the drawings. I just have to get the drawing number for you. I think you have a set.

MR. RINALDI: I have a set.

MS. WILLIAMS: It is in the bottom lefthand corner of a drawing if I remember properly.

MR. RINALDI: I do not have any more questions on this item, on the March 30th letter.

(Slide.)

MS. WILLIAMS: Item 5, cable trays. Did we verify that the construction drawings matched with the design drawings or the design?

Our review, we looked at the design drawings which are the S-900 series drawings, and we checked to make sure that they in fact matched with the design analysis. The reason it is important in the cable trays is because they used a generic design approach where they have certain standard details, standard design calculations and they apply that as an envelope to certain specific designs which they have produced, the structural design drawings 4.

Now we did go and make sure that each one's standard details that we looked at was a correct match with the analysis which qualified that support.

I want to make the distinction between that and a construction drawing where we were not really going into the field and checking the construction drawings that may be developed from the S-900 series of drawings to make sure that the design matched with the qualifying calculations.

MR. RINALDI: What is the tie to assure that the S-900 drawings are indeed pursued in the field for field drawings?

MS. WILLIAMS: There are two ways. You can go in and make -- to look and make sure that the installed condition matches the S-900 series drawing or you can compare the construction drawings with the S-900 drawings.

Quite often some sites, because we did not look at construction in the case of Comanche I can only say this

in general, they can use their structural drawings as construction and they take off details from there for the connections in items such as that, which is what I presume they do at Comanche, but it was not part of the scope of our review.

MR. RINALDI: Do you know if it was part of the scope of any other work at the site, of any other group?

MS. WILLIAMS: I cannot speak for other groups. I can only say that we are going to do walkdown of the cable trays for Phase IV, where you would make that link.

MR. RINALDI: When would that take place?

MS. WILLIAMS: I would say that is about six weeks. I don't have my schedules here with me but to give you a rough time frame.

MR. RINALDI: The S-900 drawings do indeed show compliance with the design, the 15 Standard Design, of the cable tray supports.

MS. WILLIAMS: Yes.

MR. RINALDI: Thank you.

MS. WILLIAMS: Item 6 is electrical --

MR. BACHMANN: This might be a good time to break for lunch. We will break for lunch and reconvene at 1:15.

(Whereupon, at 11:42 a.m., the meeting was recessed, to reconvene at 1:15 p.m., this same day.)

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AFTERNOON SESSION

(1:20 p.m.)

MR. BACHMANN: On the record.

MR. YOUNGBLOOD: Let's continue where we were this morning. We are at Question 6 now on the March 30, 1984 letter to CYGNA and Comanche Peak.

MR. PIGOTT: If I may interrupt, before we go off into looking at Walsh questions with respect to cable trays, in the middle of the response to 4 and 5, at the risk of being repetitive, I was going to ask Nancy to succinctly state our answers to 4 and 5 again, so that we have them at one place in the record.

MR. YOUNGBLOOD: Would it be worth pursuing, for those of us here and those of us that may be reading this transcript, how you see the overall work that CYGNA is doing, what relates to the IAP and what may relate to the rest of it that relates to what the hearing is going to be. They both interweave each other.

Would that take some thinking before you would attempt to do that?

MR. PIGOTT: May I answer that?

MS. WILLIAMS: Yes.

MR. PIGOTT: I had contemplated at the end of our presentation -- I don't know if the Staff would want to caucus, but I thought that we would caucus and go through

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and pick out the questions that you have asked, and then try and make an assessment as to whether or not they are within the IAP or if they are within 3 and 4, and give you some kind of a timeframe also as to how long it may take to answer those questions and perhaps address your concerns in that way.

MR. YOUNGBLOOD: All right. I will cite that what is in the IAP is in the IAP. If you are going to pick up some of that in what you are doing in Phase III and IV, then that is a serendipity part of it you will feed into the IAP.

MR. PIGOTT: Right.

MR. YOUNGBLOOD: Do you think maybe you can do that after we get through it?

MR. PIGOTT: If you give us fifteen minutes at the end of the meeting, I think that we can probably, at least, give you an initial shot at it.

MS. WILLIAMS: Of the things that we are discussing here, not going through the Walsh-Doyle questions and saying which ones are in scope and out of scope.

MR. YOUNGBLOOD: No.

MS. WILLIAMS: Okay.

Frank, to answer some of your questions, I have the drawing numbers that you were asking for on the connection details. Those are 2323-S-090 through 0903. The first one is 0901. It is 01 through 03. Those show

mac 8-3

connection details in various portions of those drawings where they are always bolted to the tray support in those connections, but you can find them on those drawings.

MR. RINALDI: We are also talking about the welding of supports, right?

MS. WILLIAMS: Yes. And then the clarification on that one is that the welds and supports are found on the support members but not the tray to the support or the anchorage of the tray to the support.

MR. RINALDI: You were going to indicate -- the question this morning was also related to at what location the welding did occur and to identify these locations.

MS. WILLIAMS: I understood your question to be the connections of the trays to the tray supports.

MR. RINALDI: That is one part. We are talking about the clamping devices, the trays and the supports. We are trying to determine whether the clamping was the only way that the trays were attached to the supports, the cable tray supports.

Also, I think you indicated that welding occurs along the support at certain locations. I was asking if you could clarify the locations by reference to drawings.

MS. WILLIAMS: Those, you would look at the standard details for the cable tray supports themselves where you would see which portions of them are welded, which had the

mgc 8-4

0900 series.

MR. RUSS: Those are the drawings in question. Those will show the details you require.

MS. WILLIAMS: In general, what you will find is that the members for the supports, member-to-member, are welded. Sometimes the members are welded to the clip angle or the angle which forms the baseplate.

MR. RINALDI: I'm not very clear right now from your explanation of exactly what is going on, other than reviewing the drawing in detail for the field conditions. I understand you have given me an answer. I do not think it is very clear at this point exactly what is going on, where the connections are with the clamps.

MS. WILLIAMS: You will find that in those details.

The other reference was to the report which was attached to Walsh-5. I think that when you go through the report, there will be a reference in there to an ANCO Test Laboratory report performed for Bechtel LA where they did over 2000 tests on all kinds of trays. One of the conclusions that comes out of that report is that the tray dynamic characteristics are not so much a function of tray type.

So that should lead you through it, when you read through it.

As far as the table goes for Question 4, I guess it

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was, -- is that one answered? I just wanted to make sure that I'm not getting lost in Walsh-5 versus answering your questions here in the March letter.

MR. RINALDI: In the March letter was the very simple phrase that something was missing.

MS. WILLIAMS: Item 5, you want to look at the drawings some more?

MR. RINALDI: Not just the drawings. The field conditions and construction drawings. Being there are all of the questions about the systems, I think the only way to satisfy anybody's concern is to tie the whole chain.

MS. WILLIAMS: That is out of the scope of our review.

MR. YOUNGBLOOD: That would be looked at in Phase IV at the walkdown.

MR. BURWELL: When you did your walkdown on the spent fuel pool cooling system, I think you did look at some cable trays and the supports, the cable tray supports.

MS. WILLIAMS: Only to the extent that the spacing was there and they provided adequate support to the power train to the pump, but the structure was actually the foundations in that review.

MR. BURWELL: But in doing that review, did you review the supports against the field drawings or the generic?

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MS. WILLIAMS: We reviewed them against the applicable drawings and found them to be in general conformance, but not to the level of detail in comparing the analysis -- making sure the analysis matches the cable tray supports in the construction drawings. It was not a detailed review of what I think would be required to answer what Frank is saying. I would not rely on looking at that to answer Frank's question.

MR. BURWELL: Okay. But I was only trying to get at, what did you use on the walkdown? I was not trying to get all across the bridge there.

MS. WILLIAMS: We used the 900 structural design drawings and the spec.

MR. PIGOTT: No. 5 is recognized as not within the scope of this report. It is not being asked that we pursue it further at this time.

MR. YOUNGBLOOD: That is incorrect. Our question is, CYGNA should describe how it verified that construction drawings have been correctly prepared from the 15 Standard Design drawings.

If you cannot do that within what you did before, then you can do that within what you are proposing to do. We would like that answer.

MR. PIGOTT: That's what I want to know.

MR. YOUNGBLOOD: If you cannot do that in what you

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are proposing to do, we want to propose that you go do that.

MR. PIGOTT: And in proposing that we do it, that it be done in a manner that can be used for your writeoff of the IAP?

MR. YOUNGBLOOD: Yes.

MS. WILLIAMS: Item 6 on the March letter, the question why we did not include Reg Guide 1.106 and Branch Technical Position ICSB-18 as part of our review criteria for the RHR system.

(Slide.)

Both of these guidelines are concerned with power supplied to the MOVs. To quickly reiterate the scope of the electrical control review for the RHR system, we checked the power supply to the pump, and we evaluated the control circuitry associated with a motor-operated valve, the isolation valve in the isolation tank. We did not look at a control circuit and power circuit associated with a given compoonent. My understanding of the history was that we were going to do that with the pump, and then it was decided that perhaps we should look at a motor-operated valve instead.

This got a little split there. We were not looking at both power and controls to one component. Our review scope included the valve control circuits only. We defined the valve control circuit as beginning with the

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control circuit transformer through the rest of the control circuit for the valve. The overload protection was correctly not included in the design. In other words, it was checked. If it had been a necessary part of the design, then we would have referenced those in our design criteria. But for the particular design of this particular valve, it was not part of the design, not required to be part of the design.

There are two valves in series, though. The valve in question that we looked at is 8701B, and we did look at 8702B, which is the next valve in series, to be sure that they had separate power supplies, so the single failure criteria was met.

MR. CHOPRA: Can you go back to the original question? Did you say that the control circuitry of the valve was not included in your scope?

MS. WILLIAMS: The control circuit of the valve was included. We take that from the control transformer for the balance of the control circuit.

MR. SHOPRA: It would not include the overload devices?

MS. WILLIAMS: It was not applicable to this particular valve.

MR. MOERSFELDER: The overload contacts were correctly not included in the starting coil circuit.

MR. LI: But the justification was not included.

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I think we imposed that Branch Technical Position for overload, the MOVs. The concern is, it may damage the valve, and during a critical moment, it cannot perform the safety function.

MR. MOERSFELDER: I believe you are speaking of Reg Guide 1.106 that talks about the terminal overloads.

MR. LI: Right.

MR. MOERSFELDER: It said the thermal overload protection devices will not needlessly prevent the motor from performing its safety function. Agreed?

MR. LI: Okay.

MR. MOERSFELDER: Therefore they are willing to sacrifice the motor to make every possible attempt to move that valve.

MR. CHOPRA: In normal conditions, they are bypassed. The overload conditions --

MR. MOERSFELDER: The overloads are not in the circuit at all.

MR. CHOPRA: They are not in the circuit. Okay. In other words, your scope did include to review this portion of the design, 1.106.

MR. MOERSFELDER: The review of the control circuit, yes, did verify, in fact, that the thermal overloads would not prevent the performance of the turbine function.

MR. LI: Do you intend to amend your report to

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include the statement you just made?

MR. MOERSFELDER: Yes.

MR. LI: I think this is part of the control circuit. It is not excluded. It should be in the scope, in our judgment, but the justification is acceptable. You have to amend it in the report.

MR. MOERSFELDER: All right.

End 8

9pb1

MS. WILLIAMS: I will jump to the February letter now.

MR. YOUNGBLOOD: What about item 7?

MS. WILLIAMS: There was a request to do both electrical items together.

MR. CHOPRA: Can you put that viewgraph back again? I'm not clear -- on your response.

(Slide.)

MR. LI: We're talking about the 8811B. You mentioned the single failure and refer to the 8701B, 8702B. I think the single failure we are referring to involves 8811B. That is on a single valve.

MS. WILLIAMS: The review scope was 8701B. That was the I.D. number for the oscillation valve that was originally chosen as part of the scope. Isn't that right?

Now we came into contact with checking the logic between that valve and the other valves you are talking about. We did evaluate the logic between the valves. But as far as doing a routine evaluation, the base of that was 8701B.

MR. LI: I think the scope is 8811B. That's where the problem came from.

MR. MOERSFELDER: Maybe that is the source of the confusion. We have to go back and check. What we reviewed was the 8702B, 8701B.

9pb2

MR. BURWELL: My understanding was that the 8811 -- that is why this particular thing confuses us -- that is the gist of the misunderstanding, the gist of why you asked the question.

MR. LI: 2.2 of this diagram. Here we referred to this one.

MR. MOERSFELDER: On the right side is the 8701 and -02 combination.

MR. LI: Interfaced with this valve. We are talking about this valve, not those valves.

MR. BURWELL: We're talking about the one in the little doghouse, which is 8811.

MS. WILLIAMS: That's how it was written up.

MR. LI: Texas Utilities' response primarily they addressed our concerns. They asked you to amend, to clarify the interlock.

MS. WILLIAMS: I have not seen that letter yet, that is response to the February letter. You're right in saying the intended scope was the isolation valve. If you want to go through -- since you did do, since you were part of the review -- if that would be at all helpful and take it from there --

MR. MOERSFELDER: The response that we had prepared for you for the technical, Branch Technical Position, related to the 8701, 8702, where with the two valves

9pb3

directly in series like the figure shows, I don't think there would have been a question of single failure criteria.

In the case of the 8811A, there are not two valves in series. I think that is the crux of your question. I too have not seen the April 2nd letter before, so we will have to review that.

MS. WILLIAMS: The original scope, I think, is what you're going to have to explain. Can you go through what that was?

MR. MOERSFELDER: I think now in light of this, we have to go back and review exactly -- we have to know with our review that we actually performed, we have to go back and see, or reconfirm for ourselves what we did review, to what extent.

MS. WILLIAMS: I think what I am hearing -- I want to make sure I am clear on this -- is that the program plan where this figure was contained is not --

MR. MOERSFELDER: I want to check that. I want to verify that.

MS. WILLIAMS: We will provide an answer to the February letter, which I think will still require some further checking, knowing that is how Al has explained the review scope. You have to take his answer in that light, and this clarification in that light.

If we all agree there is something else that needs

9pb4

to be checked, then so be it. In any case, this was a summary of that question -- of our response.

The question was, we have a checklist. EE-02 where we reference a pressure and there is some question as to whether we were reviewing for compliance with Section 7.6.5 of the FSAR. We will show you that checklist very briefly.

(Slide.)

The source of confusion is Item 1, subitem V where we are checking for compliance with Section 7 of the FSAR. We are not so specific as to say Section 7.6. There is a note over in the comments column discussing the 425 psi gauge pressure.

It is my understanding that the correct number for that pressure, correct valve is again, the 8701.

(Slide.)

MR. MOERSFELDER: Let me ask one other question. In the review that we did, we concentrated on the controls part of the control valve. We did not concentrate on the electrical power supply to the valve. What you are really asking about here does involve the power supply to the valve.

MR. LI: No, it is interlocked. The interlock is part of the control. The other concerns relate to interlock.

MR. MOERSFELDER: That part of the response is not prepared. We will have to review that further.

9pb5

MR. YOUNGBLOOD: Do you understand what your question is?

MR. MOERSFELDER: I think so now, yes.

MR. LI: When you review Texas Utilities' response, the April 2nd letter, I would like to bring your attention to clarify two items. In the middle of the paragraph, it says operator action, the third line from the bottom of the second paragraph. It says operator action is required to close the refueling water storage tank, the RHR pump, suction isolation valve, the 8812A/B immediately following the opening of the containment sump isolation valve.

I think this statement does not quite agree with the FSAR Section 7.6.5. The FSAR requires some kind of automatic interlock, and this says needs operator action. So I want you to check which one is correct.

The second item, the last paragraph on the first page. It says, the reactor coolant system pressure must be below approximately 425 psig before the RHR isolation valve will open. I talked to our system people, our reactor systems people, and this statement is questionable. It must be below -- I want to verify that because during the small LOCA situation the pressure may be above 425 psig, but you still have to open this valve.

I want you to verify this, these two items.

MR. MOERSFELDER: The last sentence in the last

9pb6

paragraph.

MS. WILLIAMS: Second to the last.

MR. YOUNGBLOOD: First sentence, the bottom paragraph of page 1.

MR. LI: Texas Utilities recommends in the last paragraph of this section, the CYGNA comments regarding direct interlock between containment sump isolation valve and the reactor coolant system pressure is not clear, and it should be clarified or reworded. You may have to revise your report to make it a correct assessment.

MR. BACHMANN: Let me ask a question here. The statement that was just read by Mr. Li and the Texas Utilities' letter, where they suggest that the CYGNA comment is not clear and should be clarified or reworded, did you have this letter prior to arriving here?

MR. MOERSFELDER: No, I did not.

MS. WILLIAMS: Part of our confusion is on the scope issue. It is an apples and orange question to some extent.

MR. BACHMANN: The reason I brought that up is, had you had it perhaps you might have been preparing clarification. But since you did not have it before this meeting, no questions.

MR. BURWELL: The same type of question -- there is an April 6th letter from Mr. Smith to Mr. Youngblood

9pb7

dealing with Texas Utilities' comments on CYGNA's work. I assume you have that.

MS. WILLIAMS: Yes, we're going through that right now.

MR. BACHMANN: It appears we have no further questions from the Staff at this time concerning the electrical instrumentation and control.

The next area that we want to move into, in a sense, back to, is the document control area.

MS. WILLIAMS: Do you want question number 7?

MR. BACHMANN: I guess so.

MR. YOUNGBLOOD: It gets into that area, too.

MR. BACHMANN: Mr. Spraul, who was not here this morning is here now and that was his particular question. We can move into 7 then.

MS. WILLIAMS: The question was with regard to observation WD-02-02. That observation deals with end-for-end reversal of snubbers that we found during the spent fuel pool cooling walkdown. We were asked to identify that procedure on the checklist.

(Slide.)

The procedure in question is a Brown & Root installation procedure, CP-CPM 9.17. The reason we encountered that procedure was in an attempt to resolve this observation on the end-for-end reversals, it is not on the

9pb8

checklist because what we were doing was as-built confirmation of the drawings to the installed hardware, as opposed to an evaluation of the installation procedures.

In this particular case we found that there was a discrepancy between the drawings and the installed condition and the place where that was permitted happened to be an installation procedure. So that was really part of the resolution and that is where it is documented, as opposed to something we were checking on the original review.

MR. SPRAUL: What is CYGNA's position regarding support drawings, as related to as-built drawings? Do the support drawings constitute part of the as-built package?

MS. WILLIAMS: They use the support drawings to stamp them as-built once they have done their walkdowns. It is a somewhat dynamic process, in the sense that it is going on on a continuous basis. We use the drawings that were as-built at the time, the spent fuel pool cooling, if there were any outstanding design changes then we would have incorporated them as well.

They were stamped as-built in the spent fuel pool cooling system. When you say package, that is a QC. We did not go into QC and ask for the as-built package. We went to DCC and asked for the drawing.

MR. SPRAUL: The as-built stamped drawing did not reflect this reversal allowance.

9pb9

MS. WILLIAMS: That's right.

MR. SPRAUL: Does it now?

MS. WILLIAMS: No, because this procedure permits that deviation from the drawing.

MR. SPRAUL: So at 30 years from now when someone wants to look at this, it takes the drawing, more than the drawing to reflect the as-built, right? It takes the drawing plus the procedure? Does the drawing reference the procedure?

MS. WILLIAMS: No, it does not reference the procedure. I cannot say that they did not go back and as-built those drawings. But at this point in time, no, there is no reference to the procedure. You find it because it is called a snubber installation procedure, so it is a natural place to look when you are trying to find out what the discrepancy -- what the reason for the discrepancy is.

There is no reference then at this point in time, it is not in the drawing.

MR. SPRAUL: And you still use the term discrepancy?

MS. WILLIAMS: It is an observation in this case.

MR. BURWELL: If ore is not completely familiar with all of the procedures, there is no way they can guarantee that the as-built and the as-built drawings really are in sync? How many other places may there be

9pb10

something that is completely different and people say, well, the procedures must allow this?

MS. WILLIAMS: I cannot tell you how many other places, obviously.

MR. YOUNGBLOOD: Obviously you cannot. But are there other places where there might be real confusion about the as-built drawing does not represent the as-built?

MS. WILLIAMS: I see. Let me think back on the observations that we had for the walkdowns. Let me just scan this.

MR. SHULMAN: Should not the as-built drawing represent the as-built?

MS. WILLIAMS: Yes, it should represent the as-built. I do not think it is inappropriate that they allow for something like that in a procedure though.

MR. SHULMAN: The other question is should the as-built reference the procedure then?

MS. WILLIAMS: Their as-built program should reference the procedure, but not necessarily the drawing.

MR. YOUNGBLOOD: Then how do you know by looking at the drawing that it is all right for that to be different?

MS. WILLIAMS: You would have to go out and find out why it's different.

MR. YOUNGBLOOD: Anything on that drawing that may differ, you have got to go back and hunt?

9pb11

MS. WILLIAMS: Yes.

MR. YOUNGBLOOD: Does that not lead one to say, gee, that is probably okay in the procedures somewhere. I will skip it then. It does not make any difference if it matches what the as-built is or not.

I am playing devil's advocate here. I think there should be a tie-in. If you can tell me that there should not be a tie-in, great.

MS. WILLIAMS: I think the tie-in should be that somewhere in the as-built program there is some link which you know which procedures are associated with the installation, so that you can check what they permit.

If you want to go out there and check an as-built knowing that something like this exists, you probably want to know what all of those procedures are. And that would make the correct package. I think that the as-built program, the 79-14 program, should reference those. And they do have a 79-14 walkdown procedure.

I would check there to see if that is where the link is.

end 9.

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MR. YOUNGBLOOD: I think you ought to think on it, and whatever your response is, the Applicant will want to think on it, too, and see what their response should be on that.

MR. BACHMANN: I would like to add something to that as long as we are on this sort of general subject of the as-built versus the -- as-built item versus the quote, unquote as-built drawing.

There were a couple of other observations. I only bring this up because we seem to be in the general area. Perhaps you can give us a feeling for them -- WD-07-01 and WD-07-02, both of which similar problems -- similar, not identical.

Could you comment? The first one was the difference in the grounding on the spent fuel pool cooling pump, and the other one was the fact that the temperature indicator was not installed. These were CYGNA observations.

MS. WILLIAMS: WD-07-01 deals with a requirement for safety-related motors per Gibbs & Hill drawing E1-170-301, that they be double-grounded. That is for 1E or safety-related motors. This was at the top of Attachment A for that observation review record. We had noted that this observation was invalid or not valid because a further review revealed that the detail on the grounding details we were using to check this pump against were not stamped 1E.

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That is for personnel safety only, so it was not a requirement from a safety standpoint.

MR. SPRAUL: That was confusing to me. When I read the observation, I thought all of the pump motors were to be double-grounded, not just the safety-related pump motors.

MS. WILLIAMS: But the requirement is for personnel safety.

MR. SPRAUL: But they are all to be double-grounded whether or not they are safety-related. As I read that observation, I got the impression that they were all supposed to be double-grounded. The particular one that you looked at did not happen to be safety-related.

MS. WILLIAMS: The requirement is not safety-related. The pump was safety-related. It is not a safety requirement. And we were doing this review looking for -- to make sure that there was no safety impact on any of the discrepancies or observations that we had.

MR. SPRAUL: But this observation being not safety-related, there was no follow-up. It was just dropped per se. Is that right?

MS. WILLIAMS: We do not view something for personnel safety as part of our charter, no.

MR. SPRAUL: So you have your scope limited to safety-related components, if you will, safety-related

mac 10-3

activities and hardware and so forth. But if you find something wrong outside that scope, there is no follow-up to see that it is corrected or anything like that?

MS. WILLIAMS: It does not fall within the same QA type requirements, when you come right down to it. Our overall objective is to -- is public safety and whether there is any design impact, so it really does not fit into those objectives. Again, it really does not fall into the same control requirements from a QA standpoint.

MR. SPRAUL: I assume the answer to my question is no.

MS. WILLIAMS: That's right, and I'm trying to say why, because I think it is important.

MR. IPPOLITO: Let me interject here. What I hear you saying is that a Class 1E or safety requirement for these motors is -- in order to meet Class 1E requires only a single ground that will assure that that motor functions correctly, but that there is an added requirement, added by whomever, that says double-grounded, and the second ground is required only to provide further assurance of personnel safety, OSHA requirements. Maybe no OSHA requirements, but to provide additional safety to the plant personnel. It is not related to the operational safety of the plant.

MS. WILLIAMS: Yes.

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MR. IPPOLITO: So therefore when you apprently found an installation with only one, you said to yourself, "The safety has been satisfied, although the personnel protection was not satisfied."

Am I reading you right?

MS. WILLIAMS: Yes.

MR. BACHMANN: I have been informed by Mr. Spraul that that finishes off the questions that the Staff has at this time on the items, up to Item 7.

At this time, Staff would like to go back to the document control area, now that Mr. Spraul is here, and perhaps recap a bit of what you said, for his benefit, that was said this morning, and then we can have questions on that.

MR. YOUNGBLOOD: Off the record.

(Discussion off the record.)

MR. BACHMANN: Back on the record.

MR. YOUNGBLOOD: At this point, we are gaining on where it is we are at this point. Why don't we attemot to get into the March 22nd letter that we sent with regard to advanced notice of documentation?

Our basic question at this point, one of our basic questions, in view of the April 12th submittal by the Applicant, as compared to your April 10th response to our question, does that change anything with regard to your

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response?

MR. PIGOTT: With respect to April 12th? You are speaking to the motion?

MR. YOUNGBLOOD: Yes.

MR. PIGOTT: I guess I could probably respond to that one. I have reviewed the testimony supplied with that motion. I guess the most careful way to cover it would be to specifically mention the various pieces of testimony.

The testimony provided by Mr. Hutchinson, I see nothing in that testimony that is inconsistent with the letter that we wrote on April 10, 1984.

MR. IPPOLITO: Off the record for a moment.

(Discussion off the record.)

MR. IPPOLITO: Back on the record.

Let me ask some questions. It is a fact, on the date in question you did provide to the Applicants a list of drawings that you wanted the next morning?

MR. PIGOTT: No. On the date in question, we filed a list where we asked for computer printouts to be returned. We did not ask for drawings.

MR. IPPOLITO: Fine. You asked for a printout?

MR. PIGOTT: Yes.

MR. IPPOLITO: And you provided that the afternoon before? You got the printout?

MR. PIGOTT: Yes.

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MR. IPPOLITO: Let me ask you a question. The purpose you wanted this printout -- was for what purpose?

MR. PIGOTT: There were a couple of reasons. They are reflected in the letter of April 10 on Page 2 -- to determine in effect whether or not the base information had been put into this document control computer. That was one thing. And then secondly to determine whether the documents were being distributed under proper control.

MR. IPPOLITO: Let me assume for the moment that you walked into a document control center or whatever it is called and said, "Give me this printout right now," and that printout was lacking a number of items on it.

How would this have affected what you were trying to verify?

MR. PIGOTT: I'm going to turn to the person who did it on that one.

MS. WILLIAMS: That is not what we were verifying. We were not verifying accuracy of the printout, the listing out outstanding CMCs and DCAs. That was part of the DCTG discussion, which is further on in this letter, that we make the distinction that that was a separate and distinct evaluation.

The purpose of this follow-up was that we had an observation where they were -- there were discrepancies between what the control document holders felt were the

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list of outstanding CMCs and DCAs and what the central DCC system was saying were the correct listing of outstanding CMCs and DCAs against a given drawing. That was the accuracy between two sets of lists.

Now the fact that they have implemented this computerized data base system where the satellites have remote access to the same data base, you somewhat alleviate that potential discrepancy between two manual logs being maintained.

The other part of it was the tightening up of the distribution controls, which is also part of our check of the satellite system, to see whether, in fact, that was a good solution for the file custodian system which they were previously operating under.

MR. IPPOLITO: I am afraid you have lost me.

You wanted a printout, and the printout was to verify what?

MS. WILLIAMS: Was to verify -- we wanted the printout, which was who are the controlled holders of this Document X. And they would say, "Okay, Satellites 304, 301, and what have you are the control holders of that document." That is the distribution list we are talking about. And we also wanted a listing, computerized listing or a manual in the case of the piping drawings, of what the outstanding CMCs and DCAs were for each of the drawings on the list.

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Those were the two documents that we requested, one for distribution, one for a list of outstanding change documents.

MR. IPPOLITO: And the purpose for this was what?

MS. WILLIAMS: For the distribution. We wanted to go to what were the satellites which superseded the file custodian system and see that the control document holder, in fact, was cognizant of that drawing and that the distribution system was being tightened up.

MR. IPPOLITO: Let me stop you there. What if the printout did not contain all of the things that you have listed here?

MS. WILLIAMS: All of the drawings? All of the changes? That was not the purpose of the check, though. We did not care, really. We were trying to check the distribution system, who was the control distribution holder. But the accuracy of that listing is a whole other issue altogether, and that is when you get into the DCTG verficiation process again. That was an equally large problem with a different solution.

MR. IPPOLITO: I guess I still do not see -- you have a listing. I am not sure how you have generated this listing.

MS. WILLIAMS: Random sample.

MR. IPPOLITO: Fine. If this listing does not show up on your printout, there is no way that you can check

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whether or not that change is where it should be.

MS. WILLIAMS: This is not a list of changes. This is a list of drawings.

MR. IPPOLITO: How do you know whether the missing drawing -- what happened to it? Does the man have it out there in the field? Isn't that what you were checking?

MS. WILLIAMS: No, not quite. This is a list of drawings. We wanted to know what the outstanding design changes were for these drawings, each one of these drawings. We got a separate computer listing or a copy of a manual log, 32 drawings, whatever is here. We got 32 printouts or 32 total manual and computer printouts.

Now on those printouts are who are the satellites who are responsible for controlling that drawing, and secondly, what are the outstanding design changes for each of these drawings. Those are the two documents that we walk away with.

MR. YOUNGBLOOD: Two types of documents.

MS. WILLIAMS: Right. Nowhere in that process are we asking them, is this list of design changes accurate for this drawing? You take Drawing VRHL, the first one on the list, we were not asking whether the list of design changes was accurate. That was a separate effort, separate observation, separate solution.

MR. SPRAUL: You wanted to see which satellites

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were responsible for that particular drawing?

MS. WILLIAMS: Yes, and to see if they were following the procedures.

MR. SPRAUL: The next day you went out to the satellite, and how did you determine whether they recognized their responsibility?

MS. WILLIAMS: We went out to the satellites. This is the second follow-up review, and we had done a previous follow-up review where we felt that some of the procedures were not quite adequate to implement the system that they were attempting to implement, the satellite system, and also that the clerks were not very familiar with their jobs -- somewhat understandable, because it was a new system, and they were still in the process of implementing it and all of the start-up problems that would be associated with a new system.

End 10

We went to assure that the clerks knew what their job was, that the satellites had the drawings they were supposed to have, and that they were controlling them in the manner they were supposed to be controlling them. We observed the process of the satellites during the day, we checked some 1000 pieces of change paper during the day.

MR. SPRAUL: This list is what you took out to the satellites and said show me? Satellite 301, that you do have control of this particular drawing? Or something like that? Is that the way it works.

MS. WILLIAMS: Yes, and watched how their regular operations were handled, in general, observed their access to the computerized data base system, checked that their books contained all of the CMCs and DCAs that were required to be there, as a controlled holder of that document. And we would go to several satellites, if that was appropriate for each one of these drawings, checking that process.

MR. BURWELL: Just so I understand, let's just take an example. Let's take number three, RH-1-00-3-011-S42R. I think you said that you went out to the responsible satellite station. You asked for this hanger package. You then checked the hanger package to establish that all of the outstanding change paper listed in your printout was, in fact, in that package? Is that what you did?

MS. WILLIAMS: That was one of the things we did,

yes.

MR. IPPOLITO: Going back to my question. If in doing this, following Mr. Burwell's example, you found X number of pieces or paper missing from that document, what would you do then?

MS. WILLIAMS: We would write another observation or revise the existing observation, as a system not functioning properly.

MR. PIGOTT: You had an earlier question, as perhaps now all of the documents coming up on your request.

MR. IPPOLITO: That's right.

MR. PIGOTT: I'm not sure that was answered. I believe that would have reflected that they did not have their data base in place, that they were implementing this program, and one of the things was to see whether or not they had put everything in there.

MR. IPPOLITO: That is fine. I'm sorry. I thought her response to me was so what? You had looked at it before. Let me repeat it. If you still found that this data base did not contain some of these drawings, what would you do then?

MS. WILLIAMS: We probably would have gone in and tried to find out if that was a function of the fact that they were still turning the data base over and merging it with DCC.

MR. IPPOLITO: You would pursue it and try to find out why?

MS. WILLIAMS: Yes. But finding drawings in the system has not been so much the problem, as the listings of changes associated with the drawings and discrepancies between the numerous number of lists that existed onsite, which is where the computerized data base is a good attempt to clean it up, because you're only working with one source for the list.

MR. IPPOLITO: So effectively, my hypothesizing that some of the changes were not in the package, or if some of the drawings were not in the data base, could have altered your evaluation in both of those areas?

MS. WILLIAMS: Yes.

MR. IPPOLITO: Could you identify any other instances in which you provided a listing or requested information in advance of your needing it and whether it is for verification or for the original basic review?

MS. WILLIAMS: This was the only example.

MR. IPPOLITO: This is the only example?

MS. WILLIAMS: Normally, in the technical reviews, our reviewers go down, they make the request, they take the drawings. In many cases, it was myself. I was there just physically, took the drawings. The turnaround time was within hours, in receiving the drawings. This was a second follow up

for the satellites and we were really checking to see that they were moving along the right lines and implementing the new program and felt that the empnasis was not entirely on the accuracy of the listings.

And for those reasons, thought also that the time frame was relatively short, that it was not totally inappropriat in such a setting. But in general, that is not how we conduct the audits.

MR. IPPOLITO: I liked your statement, except for the statement general.

MS. WILLIAMS: Let me take it out then.

(Laughter.)

MR. IPPOLITO: It is a very important point and I'm sure you share that with me. Obviously, I do not want to place words or characterize your audits. I think it is important that you -- what your response is regarding -- is this the exception to the rule? I guess that is the question I want to ask and I want your answer.

MS. WILLIAMS: Yes. The answer is this is the exception to the rule.

MR. IPPOLITO: The one and only exception to the rule?

MS. WILLIAMS: Yes.

MR. SPRAUL: Roughly, for this list of drawings here, can you give me some idea of how many change notices or

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engineering change order are reflected for the average drawing? Or something like that? Are we talking about one or two per drawing? 23, 50, 100, you know, what order of magnitude are you talking about?

MS. WILLIAMS: It varies. The total for the list was roughly 1000.

MR. SPRAUL: 1000 changed notices.

MS. WILLIAMS: Of change paper associated with these 32 drawings.

MR. SPRAUL: Would you like to comment on the feasibility of somebody taking this from the time that you gave it and putting those 1000 change notices properly into the data base, if they were not there?

MS. WILLIAMS: It would not be into the data base. It would be physically in the satellites, recognizing that they have to be in more than one satellite. In other words, more than one satellite can have control over one of these drawings. And you are dealing with so many. We did not think it was very feasible.

MR. IPPOLITO: Did you find the next morning, when you went to get these documents, did you find everything in order?

MS. WILLIAMS: We did not have any discrepancies.

VOICE: We may have been missing a few on the list when the paperwork was brought over. I think there were

a few missing.

MS. WILLIAMS: A log itself -- as far as when you went into the satellites. Were there any CMCs or DCAs missing?

VOICE: No.

MR. IPPOLITO: Were you surprised by this?

MS. WILLIAMS: No, it was already our second follow up. We had been pursuing this system since July and it was now October. They had been putting a fairly intensive effort, on a documented plan for developing this system. I don't think it is unreasonable to expect that they would have been slowly getting it cleaned up.

MR. IPPOLITO: What if your experience would have been different? Let's start with 10 percent of the changes were missing. How would that have affected your evaluation?

MS. WILLIAMS: It would have very negatively affected our evaluation. That is a large percentage.

MR. IPPOLITO: Let's drop it then, five percent. Is that still a large number?

MS. WILLIAMS: Even then, it would still be written up.

MR. IPPOLITO: Obviously, nothing is perfect. Would it be half a percent? You would expect? You obviously must have some criteria that says this verification -- I guess that is what you call it -- that you were doing. You know, I conclude that, based on half a percent, they are doing the

right job.

MS. WILLIAMS: We use MIL Standard 105D for the sampling, in developing the standard size for an acceptable limit. And I believe for this sample size, one error was permissible.

MR. IPPOLITO: One error means one change missing from one drawing.

MS. WILLIAMS: In this sample, 32 drawings.

MR. IPPOLITO: One change in one drawing is acceptable, two changes --

MS. WILLIAMS: Is not acceptable.

MR. IPPOLITO: Whether it is in the same drawing? I want to make sure. One change missing from any one of 32 drawings or is it one change missing from all 32 drawings.

MS. WILLIAMS: It is one change missing from one drawing, because that drawing would not be adequate. Your acceptability limits are based on 32, so one out of 32 was not correct.

MR. IPPOLITO: That is acceptable, but two is not acceptable?

MS. WILLIAMS: That's right. Then what we would do is expand our sample size to continue along the sampling process until we got a good handle on how good or bad the situation was.

MR. IPPOLITO: Basically, if you found greater than

one, it would have caused you to continue your verification program until such time as you felt that you could identify the problem and identify the problem in a very decided manner?

MS. WILLIAMS: Right, depending on how many errors there were, as to whether we would stop and say you have a lot more work to do on this system. We're not even going to go audit it anymore until it gets cleaned up, or continue the sample size because we think that might be isolated.

MR. IPPOLITO: Basically what you did, the next morning, when you got down there, you apparently found everything okay and your review stopped at that point, or your verification stopped at that point?

MS. WILLIAMS: Yes.

MR. SPRAUL: I missed most of this morning, is their effort going to pick up the piping and pipe support drawings under the same system? Was that discussed this morning?

MS. WILLIAMS: There are piping and pipe support drawings on this list. I will go through it again, if you wish.

MR. SPRAUL: Does it take long?

MS. WILLIAMS: I will try not to.

MR. BACHMANN: I think what Mr. Spraul is indicating, you're talking about the computerized system? We're talking

about the computerized versus the what we now call manual.

MS. WILLIAMS: I should make that distinction.

There is an old definition of manual and a new definition of manual. When we first started our review, back in the June-July time frame, of 1983, everything in DCC was still on a manual system. This is old manual. Everything is manual.

And then parallel, at this point in time, they were developing the computerized data base using a data base that Gibbs & Hill had in existence to track design verifications. Since it was the data base Gibbs & Hill used for design verification, not every type of drawing was at that time entered in, because not all drawings were under Gibbs & Hill's responsibility.

Pipe supports were not in Gibbs & Hill's responsibility. And then sometime in -- I believe it was August, late July or August, some time around there -- there was a merger of the DCC and what we call the DCTG data base. This data base is the one I just referred to, that they were taking from Gibbs & Hill and adapting for their purposes onsite.

Then DCC began to run off of this computerized data base. However, certain types of drawings still were maintained on a manual system, and those are the piping and pipe support drawings. And that is the new manual looks. They are still manual.

It is their intention, I understand, to put that into the computerized data base when they have completed all of the vendor certifications and everything is as built. And in the case of large bore, they have incorporated all of the design changes. They are not going to carry design changes against large bore piping and pipe supports.

MR. SPRAUL: Of the sample of 32, how many were computerized, and how many were manual? Do you have any idea?

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MS. WILLIAMS: There are seven piping and pipe support drawings -- eight. You are right. There are eight manuals.

MR. SPRAUL: And these eight had roughly their fair percentage of design changes relative to the rest of them? There is no big difference as far as design change documents for these eight as opposed to the other 24?

MS. WILLIAMS: The piping and pipe support drawings do not carry as many design changes as the electricals and structurals which are on the computerized database. The electricals and structurals have the most significant number of design changes being carried against them. The piping and pipe supports are a manageable number.

MR. SPRAUL: If there were a problem still existing in the new manual system, as opposed to the old thermal system, with a sample size of eight with relatively few changes involved as opposed to the rest of the drawings, the feasibility of double-checking to make sure that these things were right when you got to them the next morning is more feasible?

MS. WILLIAMS: Yes. We never did have a problem with the piping and pipe support drawings in our original audit.

Looking at the observations, DC 101 through 104, they are fired against the electrical and structural drawings.

MR. SPRAUL: That is because of the large number as opposed to the relatively small number on the piping and pipe supports?

MS. WILLIAMS: That could be a reason. That is supposition.

MR. IPPOLITO: Would it not be improper, since the database, whether it is the manual or the computerized one, these are living databases -- changes are made, let's say daily.

How did you factor that into what you were doing about verification?

MS. WILLIAMS: We were always operating with the list as it existed for a given point in time. I am not quite sure I understand your question beyond that.

MR. IPPOLITO: What I am trying to say is it just may have happened that on the day that you asked -- received the information or the changes attributed to these drawings, a change just came about.

How would you know that that change just came about and that it is a valid change?

MS. WILLIAMS: The first point would be that there is a time lag between a change being issued against a drawing and it being entered into the system sent to all of the distribution points and the logistics associated with any system that operates like that.

I understand that the turnaround time had been long, i.e., a week or something, which was now down to fairly rapid 24-48 hour turnaround.

MR. IPPOLITO: Was this both for the new manual and the computer database?

MS. WILLIAMS: That is my understanding. Our focus was on trying to understand the computerized database and how it was functioning, how it was intended to function.

And as I answer that question, I am mainly aiming at that. The way in which we would see that process happening would be, for example, if we looked at the centralized log and then went out to the satellites and the paperwork had not yet arrived to match the log, The real time-data being a more rapid process of entering something into the database, it is then locked up against the drawing but yet the paper has not reached the satellite yet. We did not happen to run into that but that is certainly a feasible occurrance.

MR. IPPOLITO: Therefore, had there been a discrepancy, like more than one missing document, I think what you are telling me -- or are you telling me that one of the first steps you would take is to make sure it is not a document in process?

MS. WILLIAMS: Yes.

MR. BACHMANN: I have an overall question. This is sort of a content question.

Earlier on you had used the word or words that this was sort of a second followup.

Have you done this type of shall we say testing of the satellites prior to the one in question?

MS. WILLIAMS: Yes.

MR. BACHMANN: In other words, had you gone down with a list of drawings and checked the satellites to see that they had it?

MS. WILLIAMS: Yes, and it was a longer duration audit with our people there. They went in and pulled the documents and we have some internal memoranda indicating that there were still problems and discrepancies with the system.

MR. BACHMANN: In that time, had they been given the list ahead of time or had that just been a real time -- come in, Nancy, let's look at the situation?

MS. WILLIAMS: To the best of my knowledge --

MR. BIBO: We went to document control and said these are the printouts. It did take some time to get them. We were onsite at the time.

We went in and said this is what we want, the information was given. It did take some time during the day to get the information.

MR. BACHMANN: Was it about the same size sample?

MS. WILLIAMS: I think it was.

It might have been larger for that matter. It was

at least 32.

MR. BIBO: I do not remember the exact -- maybe 32, maybe a little bit less.

MS. WILLIAMS: I believe it was 32.

MR. BIBO: We requested the same information relative to the distribution of all of the loads and a list of all changes.

MR. BACHMANN: Did this turn up discrepancies?

MS. WILLIAMS: Yes.

MR. BACHMANN: Can you give us an idea of the magnitude or the number of discrepancies versus the sample?

MS. WILLIAMS: We had five -- I am guessing now, I would say it is around there. It was enough that we did not even expand the sample. We said there is still a problem and we are going to come back when the system has been checked and corrected.

MR. SHULMAN: Five out of about 1000 ?

MS. WILLIAMS: Out of 32. We're missing a design change.

I think it was basically missing a design change. I do not know if it was a distribution problem or just missing it and I would have to go back in our minutes and check.

MR. BACHMANN: So this particular situation was to verify that they had fixed it for the first time. Am I characterizing that correctly?

MS. WILLIAMS: Yes, to see if they had corrected the problems we saw on the first followup.

MR. BACHMANN: Yes. And the second time through you corrected the problems?

MS. WILLIAMS: They had revised procedures. The clerks knew better what their what their job was and there was the checking and the distribution, the functioning, and then whether they contained all of the documents -- the satellites contained all of the documents they were supposed to.

MR. BACHMANN: Going back to the DC checklist as a whole, this particular inspection, which I guess was October, either 24th or 25th, this is dated the 24th, I assume the inspection itself was the 25th?

MS. WILLIAMS: Yes.

MR. BACHMANN: How significant was this particular action that you took compared to the entire DC section of the IAP? Based on all of the checklists, how much did it weight in your final conclusions in the DC area?

MS. WILLIAMS: I think we felt they were heading along the right directions toward implementing a system that was going to correct their problems.

It weighted in that it closed out the numbers, i.e., going in and checking.

MR. SHULMAN: Was it one-third? One-fourth?

MS. WILLIAMS: That is hard to quantify. We would not have closed it out if it were not a successful audit.

MR. IPPOLITO: Let me ask that another way.

This was the second time you went. Let's say it would have failed -- it failed your test and then you said I think in answer to a previous question that you had not closed this out, but I think you said that you would go and probably go and get another sample?

MS. WILLIAMS: If it was so bad, like in our first followup, we would just wait until it was corrected.

MR. BACHMANN: The entire DC set of checklists, the DC area, the ones that you used the DC checklists on, had this not gone through and come up with, within the one mistake out of 32, that entire section would still be open?

MS. WILLIAMS: Not so much the checklist as the observations. The checklists are the reviewer's tools.

MR. BACHMANN: I did not mean closing out the checklist. I meant closing out the areas represented by the DC checklists.

MS. WILLIAMS: An observation is borne out of one item on a checklist, so that does not have any effect on the balance of that checklist. That is why I like to focus on observations.

MR. BACHMANN: The overall DC area would have stayed open until this particular audit had come out right?

MS. WILLIAMS: No. That particular aspect of that area would have remained open.

MR. BACHMANN: Of the DC area?

MS. WILLIAMS: Of the DCC system, it is a particular area in their design change control system that we felt was weak. We wrote an observation.

MR. BACHMANN: I will go back again to my question and say how big is this compared to the overall design control system, this particular part?

MS. WILLIAMS: I think the proper functioning of the system is an important part to control the paper.

MR. BACHMANN: Necessary?

MS. WILLIAMS: To control the paper, yes,

MR. IPPOLITO: As a following question, how many times -- I will use the word "pulse" the system before you say, "Man, you've got serious problems here"?

You did it once and it failed. Assuming you failed the second time, how many times would you try to pulse it before you say you have got to fix something?

MS. WILLIAMS: That is a question on degree of seriousness and here we felt they were moving along the appropriate corrective action path.

MR. IPPOLITO: Would you go back two more times before you threw up your hands and said that the system is now working? One more time? Five more times?

MS. WILLIAMS: No one likes to spend their time futilely and if we really felt it was bad, we would not keep going down. We felt that they were moving in the right direction. It is tough to answer hypothetical questions to some extent.

MR. IPPOLITO: I do not think it is a hypothetical question.

If you were in the verification process -- and I am saying what is your criteria? How many times to you fail? If one assumes with every attempt at verification you have failed, an assumption, would you keep going back two times, three times, four times? At what point would you say "enough"?

I think it is a legitimate question to ask.

MS. WILLIAMS: I think if the system had not been corrected when we went back this time, it would have (a) remained open.

The next question is, would we have raised it to a PFR, which is our way of saying this is really a problem, Potential Finding Report, where we did that in the cable trays. That is probably the course of action we would have taken.

MR. IPPOLITO: If this one verification had proved negative?

MS. WILLIAMS: I should say the potential exists there.

MR. SHULMAN: Would it matter if you had found two problems or six problems as to whether you would have made that decision?

MS. WILLIAMS: I think it is also a function of whether we think they had corrected their procedures, whether the people know their jobs, whether this evidence shows that it is functioning properly.

It is more than just as aspect of finding one or two errors of whether we overall think it is a valuable system.

MR. IPPOLITO: Isn't the end result, is it working? One can design a system that makes every bit of logic there is but isn't the end result, you know, is it -- when you pulse the system and it keeps coming up, you know, not up to speed, don't you have to suspect one of these other parameters?

MS. WILLIAMS: Yes, you have to suspect it and if we really believe, suspect that they have a breakdown, then it becomes a Potential Finding Report, it gets raised to a higher level of visibility and we discuss with our senior review team and in-house what we think. It is either necessary for them to correct it or discuss what the root cause problems might be further and just sit back and totally re-evaluate and re-assess where they are going with it.

13pb1

MR. IPPOLITO: Could this reach a level, you may have to revise your system?

MS. WILLIAMS: It could.

MR. BACHMANN: I would like to refer to the first paragraph, page 3 of the April 10th response. This is going to be similar to a question that I asked before. You state that the documents requested were not -- on October 24, were not for the purpose of detecting problems not solely relied upon, whether TUGCO had resolved its problems with respect to accurate listings of CMCs and DCAs.

The next sentence states that that verification required an assessment of the design change tracking group activities. The documents requested, not solely relied upon, would you have given equal weight to the verification of the DCTG to this particular verification? More weight? Less weight?

There is an indication that both are relied upon. This verification and the verification at the design -- of the design change tracking group. I'm trying to get a feeling for which is the more important or the equally important. Is one much more important than the other?

Can you comment on that?

MS. WILLIAMS: I think they are equally important, but they are also separate problems. The satellite system in this list is a control and distribution problem. The

13pb2

DCTG is an accuracy problem with their listings and their database.

This paragraph is trying to make a distinction that the DCTG and the verification process for the computerized database is separate from what our purpose was with that list to check the distribution problems, and the implementation of the satellite system.

MR. BACHMANN: My question was sort of to the extent that -- I think you have answered. You said they are of equal weight within the scope of your entire investigation of the design control program.

MS. WILLIAMS: Yes.

MR. BACHMANN: That is really the answer I was looking for.

MR. IPPOLITO: On page 3, the first paragraph in quotes, this is page 3 of your April 10th letter. The last sentence says, "CYGNA did not rely solely on the review of documents to ascertain whether either problem had been resolved."

Could you tell me what other things you relied on?

MS. WILLIAMS: This is the procedures, did they revise the procedures. Our assessment of whether we think that they are viable procedures, our assessment as to whether the clerks understand their jobs, whether they are carrying

13pb3

them out. And then of course, you want to go and check the documents themselves. So there are a couple of aspects to it.

MR. IPPOLITO: But the proof of the pudding is in the eating thereof.

MS. WILLIAMS: It has got to work.

MR. IPPOLITO: Right. Wouldn't you say that that is the ruling criteria? Everything that you have just stated, you know, the procedures are there, the people are there and all of that. You can test them and they all could prove satisfactory.

But the end result, not bore out, you know, all of this. All of these good ingredients that went into making the pudding.

MS. WILLIAMS: I agree. I think they carry some weight. If you do find errors you have to look at them in light of the fact, are they even going down the right path. This is even a system that we think is going to work and comply with the regulations.

It has got to work, and it is approved. The other one pretty much puts it in perspective. It puts any errors in perspective, more likely.

MR. BACHMANN: I have a very basic question. In answer to one question on how the 32 documents were chosen, you stated they were by random. Could you just expand a

13pb4

little bit on that? Did -- this is, if I recall correctly the spent fuel pool cooling system documents.

MS. WILLIAMS: Yes.

MR. BACHMANN: Did you take a gigantic list of all the documents that were in the -- throw darts at it? You picked them at random from what sort of a pool?

MS. WILLIAMS: These are from the RHR system. You are right, though. The original review of the spent fuel pool cooling system, but because we did a random sample and a first followup using the spent fuel pool cooling, we decided to use the RHR. That is not relevant.

I just wanted to make it accurate.

MR. BACHMANN: The first followup, when you found problems was with the spent fuel pool. And the second one to see if they had corrected the problem. On the second followup you chose the RHR system.

MS. WILLIAMS: Yes, we have a list of all of the drawings that -- in the case of the RHR, the technical reviewers are using cross-discipline for doing the technical evaluation. Given that list, then they just randomly picked one off of 25 pages of drawings, or whatever the total number is.

MR. BACHMANN: Do you have a vague idea of approximately how many drawings the 32 -- 32 out of, are we talking 1,000?

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MS. WILLIAMS: I did remember that number. I would have to go back and check.

MR. BACHMANN: Do you have a general number?

MS. WILLIAMS: I'm going to guess, 200.

MR. IPPOLITO: But the sample size was based on MIL Standard 105?

MS. WILLIAMS: You can see a range and a quality level and 32 would be the given sample, yes.

MR. IPPOLITO: Are you at all surprised -- let me make the assumption again, the second verification, it showed a number of failures. It exceeded your acceptance criteria.

Since the fact that the Applicant knew that the two systems you were reviewing -- how much weight would it be if you were to find continual mistakes in those two systems, when you post it with the verification? Doesn't that add a degree of wonderment that maybe it is a bigger problem. Let's face it, you know. The way we have identified the systems and all that, you know, it is prenotice if you will. And here we have two prenotice systems, or portions of systems.

And if on the reverification -- on the first time around you found some problems. And then if you were to accept my premise that the second time around you would find problems. Isn't that a significant finding?

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MS. WILLIAMS: We thought it was, too. And that's why we wrote an observation. We would have expanded into other systems also if we found it was a continuing problem. We would not have stuck with those two systems with the "knowledge" that that is what CYGNA was in their review.

MR. IPPOLITO: I think it expands on a question I previously answered. You s? i the audit that we made -- that portion which made it open, and what you are saying, that audit would remain open.

Again, on my premise that the second time, the second go-around proved negative. What you are indicating to me is that, hey, if that were the case, I would then go look at other systems.

MS. WILLIAMS: Just as we did not stick with the spent fuel for the second followup, we would not stick with the RHR or the spent fuel for anything beyond that.

MR. YOUNGBLOOD: In Phase III and Phase IV, do you plan to do any of this in Phase III and Phase IV?

MS. WILLIAMS: It seems like it would be a good idea.

MR. YOUNGBLOOD: Without prenotification?

MS. WILLIAMS: Without prenotification.

MR. PIGOTT: In this letter and what has been stated today, I think, in justification of what we tho ht was a reasonable procedure of -- at the time for making this

13pb7

following review. I hope it is not construed that we're saying that it would have been impossible for someone to have affected our review, as a result of having it for this period of time.

We reasonably did not expect it for the number of reasons stated. But we are not going so far as to say that it was impossible for guaranteeing that something could not have happened to affect these results. We are only saying that it was reasonable, given the circumstances, and what we were atempting to do at that particular time.

MR. IPPOLITO: I understand your statement.

MR. BACHMANN: I happened to think of another question. It was stated earlier that of the 1,000 changes approximately associated with the 32 drawings, that it would not be reasonably considered feasible for changes to be made. In perspective, I would like to kind to, sort of question -- not question, but get a little better understanding of how this would work.

If someone, this hypothetical person has -- knows which of these 32 drawings from each of the satellites -- what is the worst they could do, in your estimation to bring things up to speed? What would they actually have to do if they had this list and you had the guy out there who wants to make sure that it is perfect for you. What do you understand they could possibly do if they wanted to?

13pb8

MS. WILLIAMS: They could go and make sure that for each satellite that is responsible for a given drawing, that all of the DCAs and CMCs applicable to that drawing are physically located within that satellite.

MR. BACHMANN: How would they physically do that, if you can explain briefly as far as the computerized system and the manual system?

MS. WILLIAMS: They still keep hard copies of the CMCs and DCAs in the satellites. They could take the listing of the outstanding CMCs and DCAs from the central system, just as we are getting it, find out that satellite, for example 304 is responsible for holding that drawing. Go to that satellite and make sure that all of the CMCs and DCAs applicable to that drawing are physically there.

MR. BACHMANN: On a given typical drawing, and let's take the -- let's forget the piping ones which are smaller. But on a given typical drawing, how long did it take your people to verify that all of the changes were with that drawing on a given drawing? Can you give any guesstimate, when your people went out and looked at the drawing?

MR. BIBO: It varied. You could find that a particular drawing was a satellite and there were 35 design changes, and the computerized listing which showed them numerically. You go to the hard copy of the satellite,

13pb9

where they were filed numerically in the books, and you just verified that each one of them was, in fact, in the book.

MR. BACHMANN: The drawing of 35 changes?

MR. BIBO: That is a guess.

MR. BACHMANN: Let's assume 35. I am talking about a CYGNA auditor. Now how long would it take to go through those and verify 35 changes in a given drawing?

MR. BIBO: It depends -- there may have been 15 changes right in a row, numerically, which would be in one book. You could go through 15 in one book in a matter of seconds. You would not have to go to various books.

It could take anywhere from five minutes to a half hour.

MR. BACHMANN: That's the answer.

MR. BIBO: Here again, it depends on the number of changes. In one of the satellites the changes were physically in a package with the drawings. In that case, it was really quick. You could pull out the package, 35 design changes were right there. You could verify them against the computer list.

It also varied from satellite to satellite and how they were filed. It is a little bit difficult to answer. I just wanted you to understand.

end 13.24

MR. IPPOLITO: Is it safe to say a half hour per drawing?

MR. BIBO: No, I would say it would be less than that.

MS. WILLIAMS: It was ten hours for the audit?

MR. BIBO: I was there two days.

MR. BACHMANN: It took two days to verify the 32 drawings?

MR. BIBO: Verify that the drawing for that particular satellite --

MR. IPPOLITO: One person, two days?

MR. BIBO: Yes.

MR. BACHMANN: How many people were involved in the audit of the 32 drawings?

MR. BIBO: The last review of the 32 drawings? Just myself.

MR. BACHMANN: You hit each of the 32, on all of the satellites?

MR. BIBO: Right. Some of the satellites may only have had one drawing. Like I said, it varied.

MR. YOUNGBLOOD: You went from satellite to satellite on this? The last satellite you went to was a day and a half after you gave them the list? That is a question I am asking, not a statement I am making, although it sounded that way.

141b2

MR. BIBO: I think there were seven satellites, 300 to 307. Satellites 307 to 304 were physically in one place. Yes, it may have been a day before I got to the last satellite.

MR. PIGOTT: To be clear on the timing, Ms. Williams came in on the first day and provided the list. Mr. Bibo came in on the seond day and then worked two days.

MS. WILLIAMS: It was three days total and they did not know the sequence of satellites.

MR. BACHMANN: We would like to take a ten minute break now, if it is all right with everyone.

(Recess.)

MR. BACHMANN: Back on the record.

Mr. Youngblood had a couple of follow up, additional questions, to what we were talking about just before the break.

MR. YOUNGBLOOD: One of the questions I had would be if you were to do the check again on the satellites, without prenotification, would it be -- since it takes a day or a day and a half, two days to do this -- would it be less apt to be biased by someone doing something with the packages if you were to have someone at all seven satellites at the same time, or what do you think the probability of your evaluation being biased is? Would be, not only with the 12 hour notice, but also an extra day and a half notice, that

141b3

some satellite could change up, modify, get the packages together, be sure all of the notices are in there? Since you do not find an error.

MS. WILLIAMS: Is that possible?

MR. YOUNGBLOOD: I'm asking you that question and I don't think -- maybe you can give me an extemporaneous answer. That is a question I want to lay out to CYGNA.

MS. WILLIAMS: Let me make sure I understand it. Not CYGNA people at seven satellites?

MR. YOUNGBLOOD: Yes.

MS. WILLIAMS: If you were to go back and redo it and put a CYGNA person at each one, would that reduce the possibility of any interference?

MR. YOUNGBLOOD: Yes.

MR. PIGOTT: What's the answer?

MS. WILLIAMS: Certainly.

(Laughter.)

MR. YOUNGBLOOD: What was the other question?

MR. BURWELL: May I proceed along the same path, shall we say rather than requesting a list for a request one, two, three, go do your thing; and then request three, four, you know, as you go. Would that improve your chances of maintaining control over the -- over what you are reviewing?

MR. YOUNGBLOOD: It would certainly increase their work effort if they had to go to one drawing, and then go to

three satellites, and then go back and get another drawing and go to the same three satellites.

MS. WILLIAMS: There is a possiblity, since the remote access to the data base is available at the satellites, of us having internally a sample selected and knowing because the satellites are divided by discipline, the electrical satellites say with our list that only we know what we want, and then ask them to dial up on the screen, right then and there, and see what they should see. And then go, right then and there, and check them. With the advent of the CRTs in the satellites, I would think that is a viable way to go.

MR. BACHMANN: Were these CRTs in these satellites in October of '83, at the time of your audit?

MS. WILLIAMS: I think they had just recently put them in and were getting them ready, and the bugs out.

MR. BACHMANN: Would they have had the capability to do that on October 25th, 1983?

MS. WILLIAMS: They were operational in October, yes, but we did not know that they were operational until we got down there. To some extent, it went into us asking for the outstanding listings. If we had gone and done that right at the satellite, it would have been the same information. We just did not know that portion of it was going to be operational.

MR. SPRAUL: You are saying that there are ways

that you could provide more assurance of unbiased audit results?

MS. WILLIAMS: Absolutely.

MR. YOUNGBLOOD: Our corporate memory has lost us now. Noone here remembers what the other question was, so will forget it for now.

(Laughter.)

You were going to give us a little bit on the overall scope of what CYGNA is doing and what portion of it, at this point, as you know, would apply to our IAP.

MR. PIGOTT: Do you want that now? There is one item which is a burning interest to us before we leave today, and that is to talk about how we implement the protocol from this time forward.

MR. YOUNGBLOOD: We can go with that first, if you want to. There is a little wrap up we want to do. We want to ask a few questions, for the record, that we picked up during some site visits that we made, or audits that we made. And we want to ask the questions so that we can get the answers formally on the record, rather than just having it been something that somebody picked up verbally.

MS. WILLIAMS: We went through each of the items on the March letter and identified what we think the open items are and what our follow up would be, and where that might be in time. So I wanted to take just a moment and go

through that.

In Item 1, which is dealing with document control questions, it is our understanding that there was a question on the validation of the data base and whether it would be appropriate to go in and assess how well that activity had been performed or was being performed. We think that is an appropriate thing to do and would propose that that could be accomplished by the end of May.

In the second, in the document control center, would be a reaudit of the satellite system. We, just briefly, discussed that now as the possibilities of how that may be conducted and we think it is possible to conduct that sometime by mid-May.

And Item 2, there was a discussion of three inch and four inch Schedule 40 piping. We think it would be appropriate to make a sampling of three and four inch lines and make a check to ensure that the proper SIFs at the butt weld locations does not result in any stresses above the allowables.

For Item 3, we will evaluate the concerns with respect to the increased allowable that we have discussed today. We are going to have to get back to you on what we think our course of action would be on that in the next couple of days.

MR. BACHMANN: On Item 2, you talked about the

stressing justification factors of the butt welds. Did you mean to give us any time frame on that?

MS. WILLIAMS: That one, by the end of May, would be appropriate.

MR. SHULMAN: On the one that Nancy just mentioned, we cannot give a time frame yet. We're not totally sure of our approach.

MR. YOUNGBLOOD: Let me interject here, also. These are things that we winnowed our of our discussion after we read the transcript, obviously. We always want the string to be able to add or modify.

MS. WILLIAMS: Okay.

MR. YOUNGBLOOD: I assume on question two there was a special question? Dave got on the phone and talked to someone. Was that being wrapped up in that question also? Or were you speaking to it?

MR. SHULMAN: We wrapped it up in the question, but we can give an answer now on the specific question that Dave asked.

MR. WEINGART: In regard to the counterbore Dave Terao asked about earlier, checking into the fabrication specification, it states that field counterboring shall not reduce the wall thickness of the pipe to be less than minimum wall thickness. And that minimum wall thickness is defined as being within the 12 1/2 percent of the nominal

wall thickness. I believe that was your question.

MR. YOUNGBLOOD: I interrupted you. Do you want to continue?

MR. IPPOLITO: I think when you started to proceed down this question list, that you have before you, you referred to the March 22nd letter? I think you really meant the March 30th letter.

MS. WILLIAMS: If it is the one with the seven items, yes.

MR. IPPOLITO: For the record, it is the March 30th record.

MS. WILLIAMS: On Item 4, I have nothing.

MR. YOUNGBLOOD: You're going to correct that in a revision?

MS. WILLIAMS: Yes. On Item 5, we will be checking the construction drawings and the installation for cable tray supports as part of Phase IV.

MR. PIGOTT: Am I correct that you want that pulled out so that you can have it available to finish off --

MR. YOUNGBLOOD: Anything you were doing in Phase III and Phase IV, that can be used for the IAP, I think the Applicant will want you to respond to us on the IAP, rather than waiting until you finish all of Phase III and Phase IV.

MR. SHULMAN: That is an issue in terms of timing.

MR. PIGOTT: We have not really looked at the timing on that one, because obviously you want that one first.

MR. YOUNGBLOOD: I am not anxious for you to freeze the timing on it now, if you're just giving something that you think, that's all right.

MS. WILLIAMS: Item 6, I want to clarify something that threw me off balance during the course of today's discussions. That is, that 8811B is the basis for our review scope on the electrical controls.

Now personally, I was left with the feeling that maybe something had disconnected internally, on what the basis for our review scope was. I think it was a communications problem, on what question we had answered with respect to which valves.

My first point, 8811B was the basis for a review. However, there are three other valves which are interlocked in some manner of speaking with that valve. As such, they make up part of the review of the complete systems or control logic review for that valve.

The thing that is missing is that we need to address the question in the March letter with regard to 8811B, rather than 8701B. That was our miscommunication with regard to answering the letter.

MR. BURWELL: I think you meant the February 6th letter, not the March letter.

MS. WILLIAMS: I think the clarification was appropriate, that the 425 psig guage does apply to the correction that we stated. We stuck with that valve in answering the March letter and that is what we did not intend to do.

MR. MOERSFELDER: Mr. Li was questioning me about Branch Technical Position 18 and I could not answer that on the basis of 8811.

MS. WILLIAMS: Were you one off on the 425 psi and kept on that valve. It was not the basis for that review.

MR. SHULMAN: The review was the appropriate scope. We got tongue-tied when we were talking a couple of hours ago. We were not sure whether that was clear or not.

MS. WILLIAMS: It was not clear in my mind.

end14

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MR. YOUNGBLOOD: If when we get your answer, it is still not clear, we will ask you again.

MS. WILLIAMS: I thought that was necessary to clarify.

Item 7, I'm not sure we finished that discussion. The way it was left so far was whether the as-built procedure would in any way link you to the snubber installation procedure or somehow close the loop on completing what the as-built should look like.

MR. YOUNGBLOOD: That's right.

MS. WILLIAMS: That's all I have.

MR. YOUNGBLOOD: We want to discuss protocol some. I'm sure everyone in the room is interested.

MR. PIGOTT: Do you want me to start?

MR. YOUNGBLOOD: Yeah, why not? You can start with the last sentence in your letter to us, if you want to.

MR. BACHMANN: Are you talking about the letter of April 10th?

MR. YOUNGBLOOD: No. That is not the one that I saw -- maybe it is -- yes, it is the last sentence on Page 3.

MR. PIGOTT: That is a good place to start. I think it accurately reflects the way we have interpreted and applied the protocol. The face-to-face exchanges to resolve technical issues do not fall within Paragraph 3 of

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the protocol, which would define it as a meeting and require the appropriate notice to the NRC.

Also, as we indicated earlier, it is apparent that there has been more than one interpretation applied to the protocol. We have since at least this date and probably a little bit before adopted what we reflect in here, the very conservative position that face-to-face exchanges of any type have to be noticed. But frankly, that is really not a workable way for us to proceed.

MR. IPPOLITO: Why did you propose it, then?

MR. PIGOTT: Because of the exposure that we currently have in the hearing arena, because of the -- what we perceived to be a very strict interpretation of that document coming at least from the Board, and for that matter, from Mr. Eisenhut's letter as perhaps reflecting Staff's interpretation of that letter at this time, and we felt until something more workable is put together, that we did not have the unilateral capability of implementing some alternate interpretation of that protocol. So on the grounds of being better safe than sorry, we took the most conservative view until such time as we can work out something more practical, which is what we are hoping we can do today.

MR. IPPOLITO: Let me ask you, I think I am allowed to because I am a new kid on the block to ask the question, had you had any discussions with the Staff as to the

mc 15-3

understanding of this protocol before you got started?

MR. PIGOTT: I'm going to leave that to Nancy. Perhaps you can best discuss that.

MS. WILLIAMS: No.

MR. IPPOLITO: At what time did you determine that this protocol was ambiguous or however you want to characterize it?

MR. PIGOTT: I would have to say coming out of the hearings in February, the on -- the 19th and 20th, the issue arose. It appeared - it appears from that transcript that the Chairman perceived, if not an ambiguity, what he considered to be some difference between the way it was being applied and the way he would read it. I would have to say, to my knowledge, that would be the first indication of varying interpretations.

Nancy, do you have an earlier time?

MS. WILLIAMS: No. I would say it is the February hearings and subsequent discussions.

MR. IPPOLITO: Let me ask a question, then, and this could be a criticism of the Staff as well.

In February, it looked as if we were not in synch as to what the protocol meant. Why didn't you come forward and say, "Let's clear this up now," in February?

MS. WILLIAMS: I'm not sure it was at least clear in my mind that the discrepancy existed with the Staff, so

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much as with other parties involved in the hearings, and we had made what we thought was a logical interpretation of the intent.

When you start interpreting it more literally and you start to listen to what some of the various interpretations may be, it is about that time that we started considering that we should be talking it over with the Staff.

MR. IPPOLITO: Let me ask you, how do you understand -- what are the elements that would cause you to call a meeting -- in other words, meeting Item 3? Why would you call a meeting? To discuss what?

MR. PIGOTT: As it is now? At least I would guess in the current atmosphere, resolution of corrective actions, we would, I guess, look at it practically, not think that technical eschanges, either face-to-face or on the telephone, should reach the level of a meeting, if we were to discuss whether or not certain factual -- certain facts rise to the level of an observation, I would think that would be the first point at which -- well, I guess the key is, you are probably talking about discretionary rather than purely technical interpretations, and I would guess that when you are getting into judgments, you probably have to think about meetings.

MR. IPPOLITO: What do you mean by technical

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discussions? I'm not trying to trip you up or anything. I'm looking at the protocol.

In my quick looking at it right now again, I cannot find the word "technical" in the protocol.

MS. WILLIAMS: "Technical staff to resolve open items." It is essentially the entire content of what we do.

MR. SHULMAN: The biggest problem we have is that Item 2 says "telecons." That does not define other types of interactions of a very similar nature. You could have no more implication than a telecon in terms of resolving technical issues. If it is a meeting in Al's offices in New York to talk about cable trays, between Nancy and some of our cable tray experts and people from Gibbs & Hill, how do we handle that right now? It seems to fall into a hole between 2 and 3 right now. That is where we are having our problem. We do not think that is any different than a telecon, but if we look at our interpretation of this right now, almost being overly defensive and cautious about it, it does not enable us to clearly put it in Item 2. And that is the kind of thing more than anything, I think, we want to get clarification on.

MR. IPPOLITO: What I want to do is understand how you have behaved, what has to be done about these? What I would like to know is, what has been happening?

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I have started off with No. 3 saying, you know, why would you call a meeting? What are the bases for you calling a meeting right now? Have you had any meetings with the -- with TUGCO?

MR. PIGOTT: Have we had any meetings, or have we noticed any meetings? We have not noticed any meetings.

MR. IPPOLITO: Under Item 3.

MR. PIGOTT: We have not noticed any meetings.

MR. IPPOLITO: You have not had meetings following the Protocol 3?

MR. PIGOTT: Not to the best of my knowledge.

MR. YOUNGBLOOD: In going over the draft report, a meeting was called for that, to get together and discuss that. We have done that.

Are you talking about outside?

MR. BURWELL: That is our meeting?

MS. WILLIAMS: Yes, with your reviewers. Mostly all of our work is asking questions to either find out if there is a document that we have not encountered that would address our concerns or ask them for an answer on a technical question with that information in hand. Then we go away internally and evaluate whether we still think it is a problem, whether they have to initiate corrective actions, or what our opinion on the situation is. But we do not go and discuss that with the Applicant.

mgc 15-7

The first time they see our assessment of the problem is in the draft report.

MR. IPPOLITO: Getting to Protocol No. 2, it says -- what it says here, you can talk to them on the telephone to resolve open findings.

As you are doing -- I want to underline "open findings" -- what are open findings as it relates to what you people do?

MS. WILLIAMS: It could be an unsatisfactory item on a checklist. It could be an observation. It could be a potential finding report.

MR. IPPOLITO: In other words, this is something that you have in an evaluation you have completed, and you have a piece of paper in front of you; is that correct?

MS. WILLIAMS: Yes, and we write that "in telecon," whether it is face-to-face or over the phone, to ask them what their position on it is, and that is the extent of the conversation.

MR. SHULMAN: Let's clarify that. That is what we had done in the past. As it is now, it is only over the phone. That's what we're trying to resolve.

MS. WILLIAMS: Or in writing.

MR. IPPOLITO: But what you have said is, you have also had telecons to obtain clarification of procedures, to obtain procedures, pick up the phone, "Please send me

mgc 15-8

send me Procedure No. XYZ." Is that what you do by telephone?

MS. WILLIAMS: Yes.

MR. IPPOLITO: And you can also go over and ask for it. You do both?

MS. WILLIAMS: Yes.

MR. IPPOLITO: I don't have any more questions. Do you have any?

MR. YOUNGBLOOD: I would make a statement. The protocol was not intended to keep you from doing your job of gathering and collecting information. As long as you are doing that, that is what you have been hired to do. Once you start trying to get into the resolution of some of these things, it starts getting to be a gray area in here, when you do a telephone call trying to get a resolution to some of the corrective actions and so forth. And in those cases, you probably should get the project manager on the line with you whenever you have any discussions, or if you want to have a general discussion about philosophy or something like that, you probably should get the PM on the phone with you, so that it is a three-way party.

MR. SHULMAN: I have a question independent of the content of the conversation. We understand the criterion for the content.

Do you view a technical telephone call between two people any differently than a meeting between two

mgc 15-9

technical people? That is the issue. If we walk out of here with that resolved, we would feel like we had accomplished a major part of what we need to go to work.

MR. YOUNGBLOOD: You mean technical issues to get clarification or to collect further information with regard to your evaluation? In that case, I would not. I personally would not view them differently.

MR. BURWELL: May I supplement that a little bit? I guess I am speaking on my own judgments.

End 15

Although you have not used my words, I read somewhat in what you have said the same idea. To me, face to face conversations for the purpose of collecting information in dealing in factual understanding, dealing in facts, would fall under Item 2.If you began to deal in judgmental questions, then I might look on it slightly as being --

MR. SHULMAN: You would say the same thing about a telephone call, wouldn't you?

MR. BURWELL: Yes. Whether or not it is a telephone call or it is a face to face meeting, to me it should hang on a movement into a discussion of judgmental elements.

MR. SHULMAN: Rightly or wrongly, that has been our hangup basically. We understand the concerns about the content of those discussions. We just do -- we want to make sure that there is no difference between whether there is a telephone conversation or two people or even three people meeting to discuss the same things that they would be allowed to discuss under Item 2 in a phone call.

MR. IPPOLITO: You have just heard two personal views.

MR. PIGOTT: Underline personal.

MR. IPPOLITO: Again, being the new kid on the block, I thought the purpose of the protocol, at least one of the significant purposes, was an attempt at putting on

paper certain rules for performing an independent design review that would provide the greatest assurance of underline independent -- to maintain the independence during the review. While not trying to handcuff you to do a review, I think that was the purpose.

But what we have here is I think no previous discussion as to the understanding of the protocol, both on your part and our part. I think at this point we have progressed quite deeply into this independent design review. We could always have a clarification at this point on how to proceed, you know, from here until you conclude.

Let me say that the review that the Staff wanted I am not talking about the additional review that the Board may want -- I think what has to be done here is to understand what you did and to assess whether or not it has affected independence.

That is why my question was to understand just what did you do -- and obviously I focused on the -- on two and three and I tnink you will agree with me that these are the troublesome areas.

I think what I want, I would like to know specifically what you did or how you treated two and I think your answer on three is we have never had a meeting, a pre-noticed meeting with the Applicants.

I think I need to understand what you did for

Item 2 and your understanding that certain things could be discussed face to face as being equivalent to Item 2.

Now if you think you can tell me no, that's fine. If you feel you need to take some time to think about it, that is okay too.

Am I making myself clear?

MR. PIGOTT: Yes, and I think we can probably answer it now.

MR. IPPOLITO: Fine.

MS. WILLIAMS: I will describe the activities under Item 2, then.

MR. IPPOLITO: I don't want to limit you to Item 2.

MS. WILLIAMS: That is pretty much everything we do.

I will discuss our communications in general. Ma be that would be a better way to put it.

There are two major things: we collect data and we kind of go away and do our reviews and then we come back with questions.

The questions could be, is there a document that will answer this or where is this missing piece of information.

That is kind of the first layer of [illegible]tions, where we have gone through the review and we [illegible]out something is incomplete or something does not quite fit or make sense.

Then we get that new set of information and we assess now what the picture looks like and we have internal meetings and reviews to assess what the open items are, the discrepancies, the observations, or anything that we feel is not apparently adequate at that time and then we would ask the question -- to take, for example, the 20 percent allowable on the welded attachment, please provide justification for use of a 20 percent allowable.

We could do that over the phone or we could do that face to face. We will get the answer to that and in most cases what we will do is take that internally and assess that and determine whether we feel that that is an adequate answer or not.

MR. IPPOLITO: You said in most cases.

MS. WILLIAMS: I should stop using that then. That is what we do.

Sometimes we might go back with another question based on their answer and that is the extent of the communications.

It could be done with more than one party involved in talking. It could be two of our reviewers and two of their reviewers or something of that nature. That is the type of questions which we ask.

Our assessment on those answers -- of those answers -- is a totally internal matter and that gets

documented on the observation review record and then that gets issued.

Texas Utilities does not see those documents before the report goes out and we do not discuss whether they should take corrective action until that point in time and provide them with any direction that they should be taking.

In the case of document control system, they were taking corrective action at the time, so we would have a conversation which was along the lines of "When is it going to be ready? We will come down and re-audit it and perform the re-audit."

We take the results in hand and go back internally and assess that.

What we consider to be technical exchanges of information, all interpretations and evaluations of that are internal to CYGNA.

MR. YOUNGBLOOD: You just reminded me of my other question.

You did an audit. You found a lot of problems with it. And you said we will come back and audit this again later. Why weren't those observations, instead of going back and doing it later?

MS. WILLIAMS: This is Rev 1 of the observation. There was a Rev 0 of the observation, which is on our file at CYGNA which is the results of the first audit. In that, I

heard your answer.

MR. IPPOLITO: Any other questions on the protocol?

(Pause.)

MR. BACHMANN: After referring to Mr. Ippolito, the Staff's conclusion at this point and subject to definite further discussions, would be to leave the actions taken by CYGNA vis-a-vis the protocol, as you have stated in your letter, for the time being, for the present.

As Mr. Ippolito stated before, you have heard some personal observations. The Staff will be discussing what we have talked about today, probably tomorrow or very, very shortly, believe me.

We will be getting back to you on a better, or at least a more complete interpretation of what we have discussed.

It will be the Staff's suggestion that the steps described by CYGNA's, let's say, new interpretation or current interpretation of the protocol, especially as described on page four of the April 10 letter, last paragraph, beginning with "During the interim . . . " with CYGNA adopting the most conservative interpretation, be left in place until the Staff has had a chance to discuss amongst themselves what we have discussed today.

We are not going to hang you up very long. We simply have got to have a chance to discuss this a little

bit further and make a definitive statement to you, which should be done in very short order.

MR. IPPOLITO: Let me add to that, I do not like leaving you in the position that you are being left. Had I had the background and understanding of why these three steps in the protocol were written the way they were written, if I had that understanding, you would have gotten an answer right now.

I don't have an understanding and until I get that understanding I just will not give you an answer right now.

Let me say this to you: whatever comes out, we will meet and we will have a thorough discussion of whatever protocol, whether it is these or any other protocol that might be devised for carrying us from this point forward.

I know you prefer to walk away with an answer today but I cannot do it.

MR. PIGOTT: I understand that, and obviously you recognize this conservative approach virtually stops our activity.

MR. IPPOLITO: I will not agree with that. I cannot agree with that because you can still go fact-finding.

MR. PIGOTT: By telephone.

MR. IPPOLITO: You are on site, so instead of walking to trailer number three or whatever it is, you pick up the phone and call trailer number three.

Item 6 Response
(Electrical/I&C)

- Both regulatory guidelines are concerned with power supplies to MOV's.

- The review scope included valve control circuits only.

- Although the approved scope only included one valve, there are two valves in series which are powered from separate sources.

Response to NRC letter of February 6, 1984 from
Mr. B.J. Youngblood to Mr. R.J. Gary

Question

The interlock described in Cygna checklist EE-02 is not in conformance with FSAR Section 7.6.5 requirements. Conversely, the Cygna report is silent on the control and interlock requirements described in FSAR Section 7.6.5. Cygna should explain this inconsistency and confirm that the design is consistent with the FSAR.

Independent Design Review Checklist

ELECTRICAL (INSTRUMENTS & CONTROL)

Reviewer A. Moersfelder/J. Dady

Checklist No. EE-02

Date 9/27/83

Item	Satisfactory Yes	Satisfactory No	Comments
1. Does the design of the control circuits comply with the following regulations, industry standards and project-specific licensing requirements:			
a. Gibbs & Hill Instrumentation and Control Diagram 2323-M1-2263-06, Rev. 5?	X		Although the drawing is not marked Nuclear Safety Related, it is classified as Class 1.
b. CPSES/FSAR, Section 7?	X		Defines requirement that valve 1-8811B be interlocked to prevent opening until pressure decays to 425 psig.
c. Gibbs & Hill Instrumentation and Control Diagram 2323-M1-2260-05, Rev. 4?		X	1. Drawing is not marked Nuclear Safety Related, but is noted as Class 1. 2. Logic diagram for Loop Inlet Isolation Valve has no reference to Note 4 which describes Alternate Power Supply connections. 3. Loop A inlet/outlet isolation valve logic does not agree with Loop B after Alternate Shutdown capability change. FSAR section 7.6 indicates that inlet/outlet valve logic is identical for both loops. This discrepency is due to modifications required to meet fire protection regulations.

NRC letter of February 6, 1984 from
Mr. B.J. Youngblood to Mr. R.J. Gary

Response

- Cygna's review found that valve 1-8701B, not 1-8811B, is interlocked to prevent opening until the RCS pressure decays to 425 psig.

- The Cygna review did corroborate that valve 1-8811B meets the interlocking requirements described in FSAR paragraph 7.6.5.

Item 7

(Walkdowns)

Cygna should identify the Texas Utilities procedure which served as the basis for closing Observation WD-02-02 on the checklist.

- Brown & Root installation procedure CP-CPM 9.17 allows end-for-end reversal of snubbers.

- The checklist does not reference the procedure since it is an installation procedure. The walkdowns were intended to verify whether or not the installed hardware matched the as-built drawings.

MR. PIGOTT: We recognize that.

MR. IPPOLITO: It may hinder you in some respects but I will not agree that this is going to bring it to a full stop, especially if we are talking about a short period of time.

MR. PIGOTT: It perhaps does not stop collection of data purely and simply by telephone. It does bring to a stop interpretations of data or finding out what people mean by particular documents, that part of it -- other than the gathering. That is about where we are at in the process but I understand your position. You have got to understand all the corners of it before you are ready to respond.

Let me say, myself and Nancy, we will be in town tomorrow and available if there is anything we can do further on this subject.

MR. IPPOLITO: Would you give Mr. Burwell a place of contact. I am not going to promise it will be tomorrow.

MR. PIGOTT: We are anxious and we will be back in hearing on Tuesday. It makes Monday very difficult for meeting.

Obviously it is an important matter to us and to the Applicant, I suspect.

MR. IPPOLITO: I hear you.

MR. BACHMANN: Does that take care of comments on the protocol situation?

MR. REYNOLDS: We filed a letter yesterday with Mr. Eisenhut dated April 18th, from Mr. Schmidt. We would appreciate it if Mr. Ippolito would review that letter before he makes his decision on the protocol question.

MR. IPPOLITO: I am in receipt of that letter . I will use whatever facts I need to make a decision, all available facts.

MR. BACHMANN: Dave Terao has some followup questions.

MR. TERAO: I will try to make it short. I would like to talk about pipe supports for a moment here, pipe supports and standard industry practice.

In your April 10th letter, you refer to the Board memorandum, on March 15th, 1984, where it states, "We are concerned that whenever CYGNA relies on industry practice it be able to specify the scope of that practice. It also should be able to obtain and review the engineering analysis that supports the alleged practice. Then and only then will the Board know whether this practice comports with the applicable regulations and code sections."

I think one thing that I would like to reach an understanding with CYGNA on, recognizing that CYGNA has performed other independent design verifications on Fermi 2 and Grand Gulf, I am sure it has had many experiences going through other plants -- I also recognize that in the

February hearing, there was some discussion about -- I think Mr. Ward testified that CYGNA was not to comment on good versus poor engineering practice.

I do not want to talk about good versus poor engineering practice. What I want to talk about is standard engineering practice versus non-standard engineering practice.

From CYGNA's experience, I would like to understand if CYGNA considers the pipe supports at Comanche Peak to conform to standard engineering practice, or -- in other words, in your opinion, do you think the pipe supports, typical pipe supports at Comanche Peak are in conformance with standard engineering practice or not?

End 16.

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MR. PIGOTT: For the systems we looked at?

MR. TERAO: For the walkdown you performed on the spent fuel pool cooling system. It is not typical. The supports on the spent fuel pool cooling system are simple from what you have visually seen in the rest of the plant informally. Recognizing that it is not like the spent fuel pool cooling system supports, would you say those supports are typical of standard industry practice?

MS. WILLIAMS: I think as time goes on, we are learning more and more about what is common at Comanche Peak. We started with the spent fuel, which was a relatively simple system. We went to the RHR; it was still relatively simple. Now we are doing the component cooling water and the main steam. We are finding that there are a lot of unit designs. I am not commenting on whether that is good or bad by saying that. I am just saying we are becoming more knowledgeable on the gamut of designs that are in place at Comanche Peak, and we are discussing that amongst ourselves right now.

MR. TERAO: The reason I feel this is a very important point is, if according to the Board memorandum, if you are to justify engineering practice or industry practice, let's say, I think a more important question is, does Comanche Peak's support design, if they are not industry practice, is it valid to use standard engineering procedures, practices, for the support designs applicable to Comanche

mgc 17-2

Peak?

MS. WILLIAMS: I think that is a fair question, but I am not sure we are ready to answer it today.

MR. IPPOLITO: I cannot leave it like that. The obvious next question is, when can you answer it?

MS. WILLIAMS: We have got some questions outstanding on the pipe supports that we are reviewing in Phase III. It is within the scope of Phase III with what we looked at in Phase II and Phase I that we are getting this understanding of waht the general practices at Comanche Peak are, and we are at the point now where we have to have some in-house meetings and project reviews to discuss that. We are going to be doing that over the course of the next month.

MR. SHULMAN: Part of the reason -- I'm not sure there is one answer to it. There may be several answers to different aspects that may come out of Phase III and Phase IV.

MS. WILLIAMS: Nonstandard practice does not mean they do not meet the codes. It may mean they are unit designs. We want to assure ourselves that all proper considerations have been given to them.

MR. TERAO: But again, I want to point out that nonstandard practice in support design can invalidate standard engineering assumptions or practices, ignoring

mgc 17-3

some of the things the rest of the industry may do --

MS. WILLIAMS: That's right.

MR. SHULMAN: We agree with that.

MS. WILLIAMS: Yes.

MR. BACHMANN: Any more on this particular item?

MR. YOUNGBLOOD: We should discuss a little bit -- ordinarily we would think of, if you have gotten everything wrapped up, then you would send in a final report. This may take another iteration before you send in a final report. I don't know. This is something you may want to meet with us and the Applicant to discuss or something.

MR. BACHMANN: I think that might stand a little bit of clarification, since the November 1983 submittal was entitled "Draft Final." There were indications on -- in the testimony on the transcript during the February hearings that certain of the observations and resolutions of those observations would be updated in time for the final filing.

Can someone put that in perspective on what are the steps in producing a final report sometime? Is that dependent upon certain other things occurring? Could you please clarify that for us?

MS. WILLIAMS: All those that we know need updating or revision at this time, they are sitting in my office. They are revised. We recently received the Applicant's comments on the report, and now we need to go

mgc 17-4

through and see if there are any additional comments that need to be incorporated. And then there are two vehicles we can use for issuing it. We can either do an errata and a new cover sheet which says this is Rev 0, no longer draft, or we can just reissue the entire report.

MR. BACHMANN: I understood the reason for entitling it the Draft Final Report was so that you could take the former course without reissue.

MS. WILLIAMS: Yes.

MR. BACHMANN: Do you have a timeframe for when you feel this might be done, and if there are any hangups or impediments to that, can you let us know?

MR. PIGOTT: We did have -- frankly, as a result of this meeting, we will probably have to determine whether or not the items discussed today should properly be considered and included in whatever comes out as the final report. So although we felt at one time we were fairly close to a final, I would have to think that we have to reassess just exactly where we are before we can put out that final-final.

MR. BACHMANN: I don't know if we mentioned it earlier, but other than the Staff and CYGNA, I guess we only have representatives of the Applicant here.

Did anyone from the Applicant's side want to make any statements or comments on the record?

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MR. REYNOLDS: No.

MR. BACHMANN: They indicate no.

Does CYGNA wish to make any more statements about what we discussed today just for the record, anything you happen to think about before we wrap this up?

(No response.)

MR. BACHMANN: Staff, any other comments?

(No response.)

MR. BACHMANN: The meeting is closed.

(Whereupon, at 4:52 p.m., the meeting was adjourned.)

CERTIFICATE OF PROCEEDING

This is to certify that the attached proceedings before the NRC COMMISSION

In the Matter of: Meeting with Cygna Energy Service (for Comanche Peak)

Date of Proceeding: 19 April 1984

Place of Proceeding: Bethesda, Md.

were held as herein appears, and that this is the original transcript for the file of the commission.

Barbara Whitlock

Official Reporter - Typed

Barbara Whitlock

Official Reporter - Signature

CYGNA

TEXAS UTILITIES SERVICES, INC.
INDEPENDENT ASSEESSMENT PROGRAM
COMANCHE PEAK STEAM ELECTRIC STATION

APRIL 19, 1984

CYGNA RESPONSE TO
NRC QUESTIONS
OF FEBRUARY 6 AND
MARCH 30,1984

Item 1
(Design Change Control)

Cygna should provide an assessment of:

(1) The adequacy of the document control system to assure the plant was constructed in accordance with all design changes prior to the introduction of the computerized document listing system.

(2) The adequacy of the document controls on piping and pipe supports which were not included in the computerized document listing at the time of the reinspection.

Item 1 Response
(Design Change Control)

(1)

- As-built walkdown of a completed system

- Data base validation activities which were on-going at the time of the Cygna review.

Independent Assessment Program

Purpose

- Provide supplementary evidence and additional assurance regarding the overall design quality of the Comanche Peak Steam Electric Station (CPSES)
- Address the concerns and comments expressed by the NRC in letters to Texas Utilities dated May 4 and July 15, 1983, including supplement.
- Satisfy the commitments made at the August 18, 1983 NRC meeting regarding content of the program plan, which was subsequently approved by the NRC.

Program Objectives

- Provide an assessment of the adequacy of the design control program
- Provide an assessment of the design adequacy of a selected system
- Verify a selected as-built configuration
- Evaluate the extent of implementation of selected design control program elements

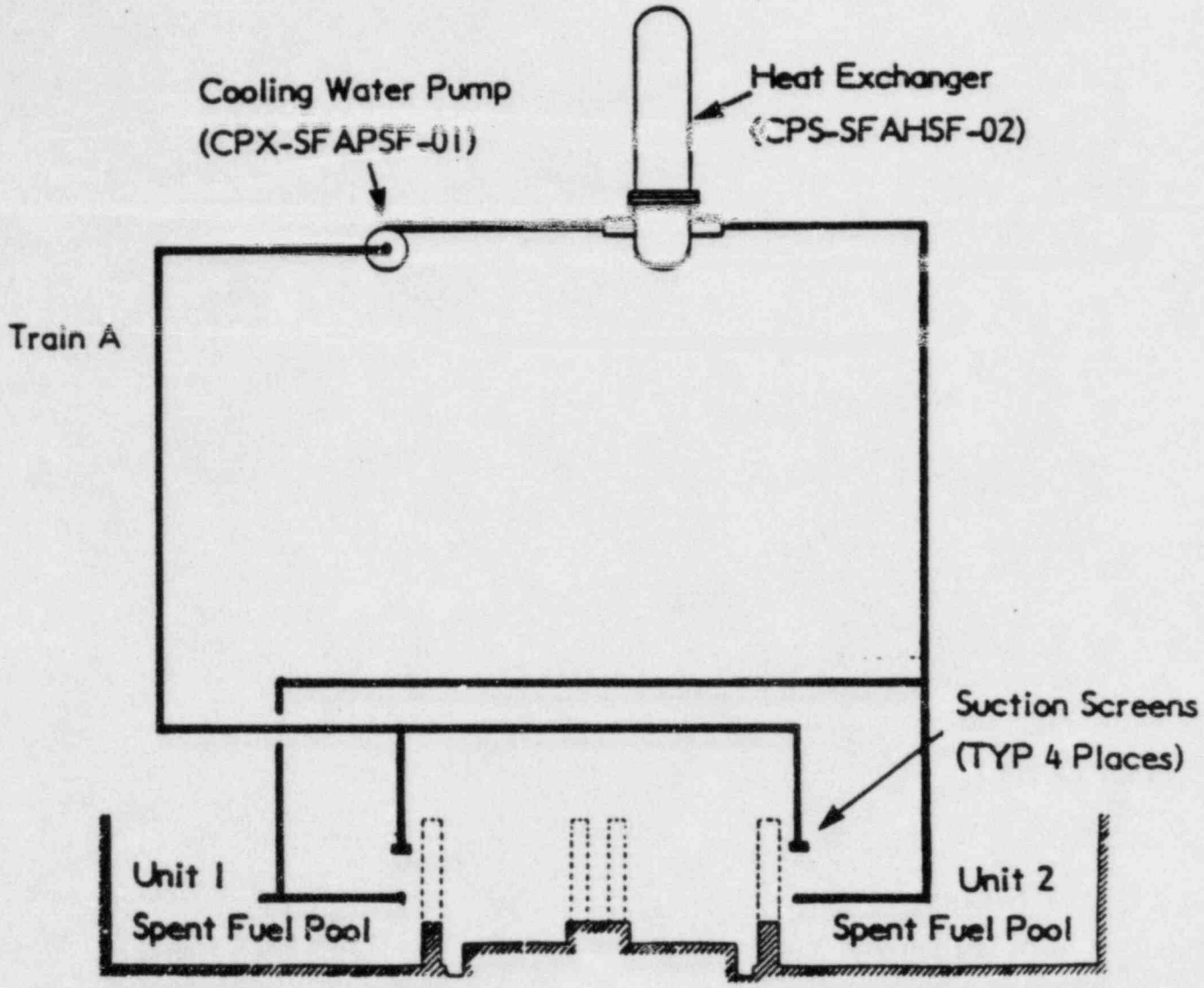
Review Scope Selection Criteria

- Include a cross-section of disciplines
- Include characteristics which cannot be verified by normal means, such as performance testing
- Include several organizational interfaces
- Include design changes
- Include other specific concerns identified by the NRC

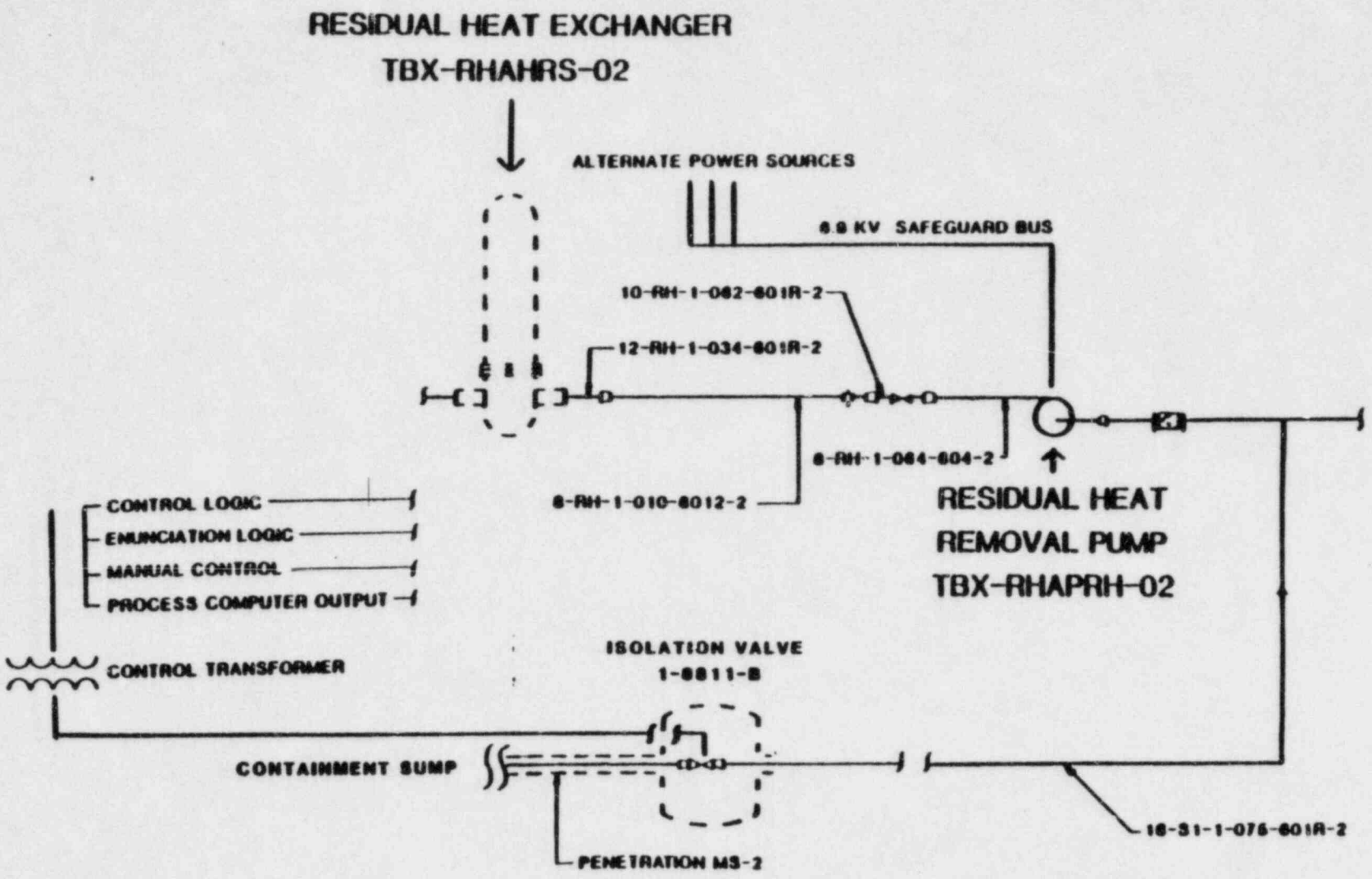
System Selection Criteria

- Safety-related
  - reactor operation
  - reactor protection
- Design and materials interface with Westinghouse
- Design and materials interface with Gibbs & Hill
- Demanding design parameters
- Turned-over to the start-up group

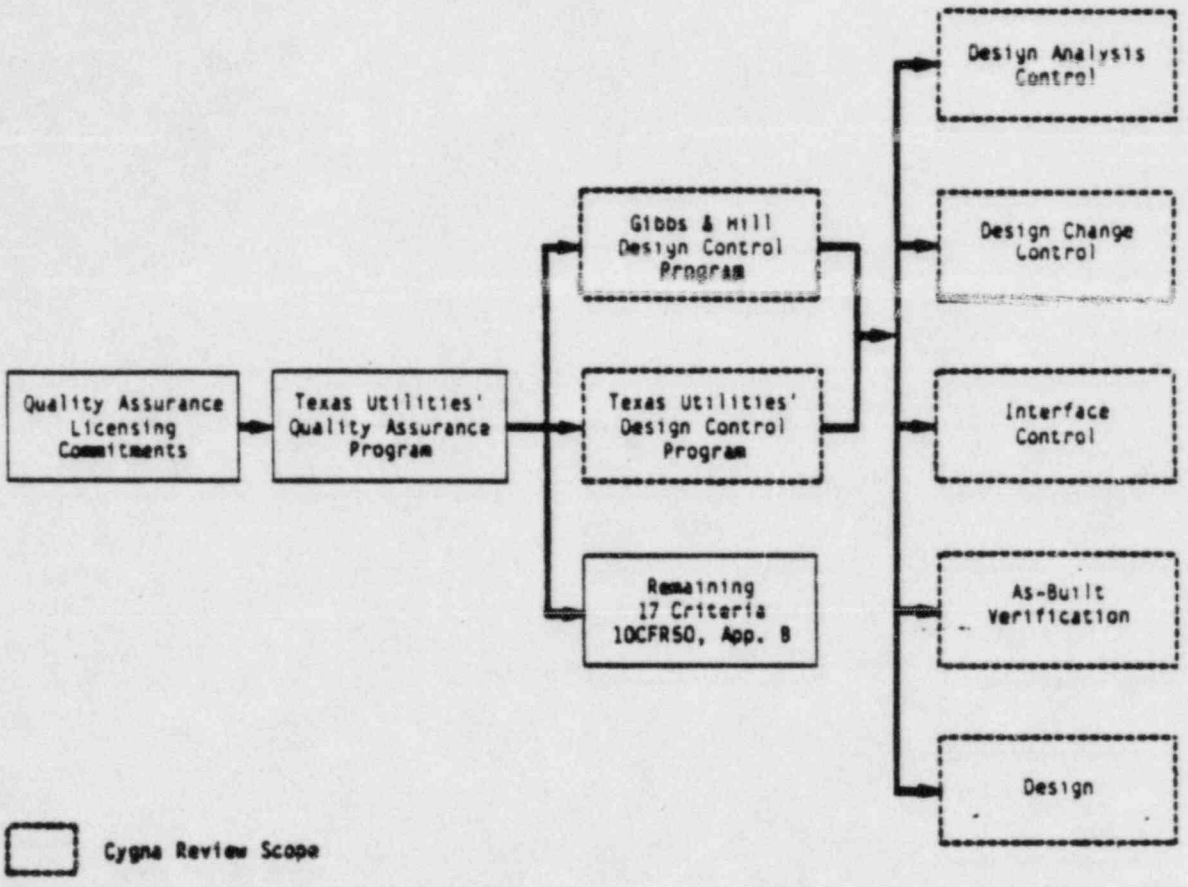
Spent Fuel Pool Cooling Element



RHR Train "B" Element



Review Scope



(2)

- Not originally part of the design verification data base which serves as the basis for the DCC data base.
- Large bore piping and pipe supports will be entered into the data base upon final vendor certification and incorporation of all design changes.
- Small bore piping and pipe supports will be entered into the data base upon final vendor certification.
- Pipe supports are part of the as-built verification program.
- Vendor certification includes a final check of each support as-built configuration and associated analyses.
- Piping is field checked to a 79-14 as-built verification walkdown procedure.

Item 2

(Pipe Stress)

Regarding Observation PI-00-01, Cygna should provide an adequate explanation of whether girth butt welds between straight sections of piping (sizes 3 and 4 inch, schedule 40) conform to the ASME Code requirements for welded joints.

SYGNA

SYGNA

Observation Record

Checklist No.	General	Revision No.	0
Observation No.	PI-00-01	Sheet	1 of 1
Originated By	M.K. Mani	Date	10/6/83
Reviewed By	J.C. Minichiello	Date	10/18/83

1.0 Description

Gibbs and Hill does not specify any weld mismatch (δ) when determining stress intensification factors for butt welds.

2.0 Requirement

2.1 Brown and Root Inspection Procedure CP-CPM 6.9D, Rev. 5, Section 3.10.1.3 allows 1/32" radial mismatch.

2.2 ASME Boiler and Pressure Vessel Code, 1974 edition, Section III, Figure NC 3673.2(b)-1 states that

$$i = 1.8 \text{ for } t < 3/16" \text{ or } \frac{\delta}{t} > .1$$

for as-welded butt welds.

3.0 Document Reference

Computer output for the as-built analyses of stress problems AB-1-69, Rev. 0, and AB-1-70, Rev. 0.

4.0 Potential Design Impact

Use of an SIF of 1.8 rather than the value which was used (1.0) may result in stresses greater than allowables.

Attachments

A. Observation Record Review

Extent		
Isolated	Extensive X	Other (Specify)

Texas Utilities Services, Inc.
Independent Assessment Program; 83090

CYGNA

CYGNA

Observation Record Review
Attachment A

Checklist No. General	Revision No. 0
Observation No. PI-00-01	Sheet 1 of 2

	Yes	No
Valid Observation	X	
Closed	X	

Comments

1.0 Probable Cause

Inadequate procedures.

2.0 Resolution

Cygna is concerned primarily with welds at elbow to pipe joints for the following reasons:

a. Welds at reducers will be taken care of by the reducer, SIF = 2.0.

b. Welds at tapered transition joints (TTJ) will be taken care of by the TTJ, SIF = 1.9.

c. Welds in long straight runs (between spool pieces) will typically have much lower load and stress levels than near elbows.

In response to Cygna's comment, Gibbs and Hill referenced NUREG/CR-0371 "Stress Indices for Girth Fillet Welded Joints Including Radial Weld Shrinkage, Mismatch and Tapered Wall Transitions" by E.C. Rodabaugh and S.E. Moore (1978). In it, Rodabaugh and Moore state that mismatch should be considered for stress indices only for $t < 0.237"$. This was adopted by the ASME Code in the Summer 1981 addenda for transition joints (para. NB-3683.5(a)) and welds (para. NB-3683.4). While it has not yet been changed in subsection NC, pargraph NC-3673.2(b) does allow the SIF (i) to be calculated based on the stress indices (C_2 and K_2) using

$$i = C_2 K_2 / 2.$$

Approvals		
Originator	M. K. Main	Date 11/4/83
Project Engineer	John C. Hanchett	Date 11/5/83
Project Manager	W. H. Williams	Date 11/5/83
Senior Review Team	[illegible]	Date 11/5/83

Texas Utilities Services, Inc.
Independent Assessment Program; 83090

CYGNA

CYGNA

Observation Record Review
Attachment A

Checklist No. General	Revision No. 0
Observation No. PI-00-01	Sheet 2 of 2

	Yes	No
Valid Observation	X	
Closed	X	

Comments

Therefore, for butt welds with t > 0.237"

$$C_2 = 1 \qquad K_2 = 1.8$$

$$1 \times 0.9 < 1 \text{ therefore } i = 1.0$$

For welds with t < .1875, Gibbs and Hill has used an SIF of 1.8, so it is only those welds on piping where .1875 < t < .237 which may have unconservative SIF's. From the piping specification, this situation involves only 3" sch 40 and 4" sch 40 piping. For these, the SIF for an elbow (1.8 and 2.0, respectively) are equal to or greater than the SIF for the butt weld. Thus, the Gibbs and Hill analyses are acceptable and Cygna considers this observation closed.

Approvals		
Originator	M.K. Jhaveri	Date 11/9/93
Project Engineer	[illegible]	Date 11/5/93
Project Manager	[illegible]	Date 11/5/93
Senior Review Team	[illegible]	Date 11/5/93

Texas Utilities Services, Inc.
Independent Assessment Program; 83090

CYGNA

Item 2 Response
(Pipe Stress)

- Later Codes use stress indices for the primary stress checks instead of SIF's.

- A comparison of the Code of record with later codes shows the later code is less restrictive for primary stress checks on butt welds.

Code of Record

$$\frac{PD_o}{4t} + .75i \frac{M_a}{Z} \leq S_h$$

Later Code

$$B_1 \frac{PD_o}{2t} + B_2 \frac{M_a}{Z} \leq 1.5 S_h$$

For butt welds $B_1 = .5$, $B_2 = 1.0$

Substituting

$$\frac{PD_o}{4t} + \frac{M_a}{Z} \leq 1.5 S_h$$

In conclusion:

$.75 i \geq 1$

and

$S_h < 1.5 S_h$

Item 3
(Pipe Stress)

Cygna should provide an explanation on whether the use of a 20% increase in upset and emergency allowables, when considering welded attachment stresses in combination with general piping stresses, consistently results in calculated design stresses which meet more recent Code Cases for all welded attachment designs and materials.

Item 3 Response
(Pipe Stress)

- The Gibbs and Hill allowable is less than the Code Case allowables for all conditions for SA106 B piping.

- The Gibbs and Hill allowable is less than the Code Case allowable for all conditions, except emergency, for 304 and 316 stainless steel piping.

- For 304 and 316 stainless steel piping, the Gibbs and Hill emergency allowable is less than the Code Case emergency allowable if the temperature is less than approximately 400° F.

TABLE 1

COMPARISON OF GIBBS & HILL TO
CODE LIMITS FOR WELDED ATTACHMENTS

Material	Temp. (°F)	S_H (ksi)	S_y (ksi)	1.5 S_H (G&H)	1.5 S_y (Code)	2.16 S_H (G&H)	1.8 S_y (Code)
A106B	200	15	31.9	22.5	47.9	32.4	57.4
	650	15	25.4	22.5	38.1	32.4	45.7
312, 316	100	18.8	30.0	28.2	45.0	40.6	54.0
358	400	18.1	21.4	27.2	32.1	39.1	38.5
	650	16.7	18.5	28.1	27.8	36.1	33.3
312, 304	100	18.8	30.0	28.2	45.0	40.6	54.0
358	400	16.2	20.7	24.3	31.1	35.0	37.3
	650	15.9	17.9	23.9	36.9	34.3	32.2

Item 4

(Cable Tray Supports)

Cygna should revise Exhibit 4.3-1, Allowable Stresses, of Design Criteria DC-3 to include the Safe Shutdown allowables.

Item 4 Response
(Cable Tray Supports)

EXHIBIT 4.3.-1

ALLOWABLE STRESSES

	Load Case			
	Operating		Safe Shutdown*	
Stress	Value	KSI	Value	ksi
Tension	0.6 F_y	21.6	0.96F_y	34.56
Shear	0.4 F_y	14.4	0.64F_y	23.04
Web Crippling	0.75 F_y	27.0	1.2 F_y	43.2
Compression	F_a per AISC Section 1.5.1.3		1.6 F_a per AISC Section 1.5.1.3	
Bending	F_b per AISC Section 1.5.1.4		1.6 F_b per AISC Section 1.5.1.4	
Bearing	0.9 F_y	32.4	1.44F_y	51.84
Bolts 307: Tension and Shear	Per AISC Appendix Section 1.5.2 and 1.6.3		1.6 x Allowables per AISC Appendix Section 1.5.2 and 1.6.3	
Anchor Bolt	See Exhibit 4.4-1		See Exhibit 4.4-1	
Welds (Fillet, Full or Partial Penetration):				
Shear	0.3 F_y (Weld Metal)	21.0	0.48F_y (Weld Metal)	33.6
Tension	0.6 F_y (Base Metal)	21.6	0.96F_y (Base Metal)	34.56
Combined Stress	As per AISC Section 1.6.1		As per AISC Section 1.6.1	

*1.6 x Operating Allowable

Item 5

(Cable Tray Supports)

How did Cygna verify that construction drawings were correctly prepared from the 15 standard design drawings?

Item 5 Response
(Cable Tray Supports)

- Cygna's review did not include verification of field-prepared construction drawings.

- Structural design as shown on the 2323-S-900 series drawings were checked for consistency with design calculations.

Item 6

(Electrical/I&C)

Why weren't R.G. 1.106 and BTP ICSB18 (PSB) included in Cygna Design Criteria DC-5 for the electrical design review?

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

FEB 6 1984

Docket No. 50-445

Mr. R. J. Gary
Executive Vice President
Texas Utilities Generating Company
Skyway Tower
400 North Olive Street
L. B. 81
Dallas, Texas 75201

Dear Mr. Gary:

Subject: Independent Assessment Program (IAP) Performed by Cygna

In the course of the NRC staff's review of the Cygna Report we have found an inconsistency which requires explanation. In Appendix E, Document No. DC-5 Cygna describes the electrical system review criteria to include the control circuit (the manual and automatic logic) that operates valve 1-8811B. This review is detailed in Appendix H, Checklist EE-02. FSAR Section 7.6.5 (FSAR Pages 7.6-17 through 7.6-19) describes the control and interlock requirements for the recirculation sump isolation valves (8811A and 8811B). These valves open automatically when two of four refueling water storage tank level signals are less than the Lo-Lo-1 level setpoint in conjunction with the initiation of the engineered safety feature actuation signal ("S" signal). The design provides for the retention of the "S" signal to allow automatic switchover from injection mode to recirculation mode of the ECCS. The recirculation sump isolation valves are also interlocked such that they must be closed before the following valves can be opened:

1. RWST/RHR pump suction isolation valves, 8812A and 8812B.
2. RHR inner or outer isolation valves 8701A, 8701B, 8702A, and 8702B.

In the Cygna Report, Appendix H, Checklist No. EE-02, it only mentions that valve 1-8811B should be interlocked to prevent opening until the pressure decays to 425 psig. The interlock described by Checklist EE-02 is not in conformance with FSAR Section 7.6.5 requirements. Conversely, the Cygna Report is silent on the control and interlock requirements described in FSAR Section 7.6.5.

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Cygna should be instructed to explain this inconsistency and to confirm that the control and interlocks circuitry for valve 1-8811B is designed consistent with the description given in FSAR Section 7.6.5. Texas Utilities should comment on the design adequacy of the control and interlock circuitry for the recirculation sump isolation valves.

Texas Utilities should give us your overview on the Cygna report including any statements, comments, or corrections you deem appropriate at this time. Your response should specifically comment on and describe your actions concerning the Cygna suggestion that a set of standard instructions be prepared for the design, revision and review of cable tray supports (p. 4-12); and the Cygna suggestion that the anchor bolt embedment lengths be deleted from the support drawings (p. 4-10).

Sincerely,

B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing

cc: See next page

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

MAR 2 2 1984

Docket No. 50-445

Mr. L. L. Kammerzell
Vice President
CYGNA Energy Services
101 California Street
Suite 1000
San Francisco, CA 94111

Mr. R. J. Gary
Executive Vice President
Texas Utilities Generating Company
400 North Olive Street
L.B. 81
Dallas, Texas 75201

Dear Sirs:

Subject: Independent Assessment Program on Comanche Peak Steam Electric Station Performed by CYGNA

This letter concerns the Independent Assessment Program on the Comanche Peak Steam Electric Station performed by CYGNA for the Texas Utilities (TUGCO). Recently certain information has been developed during the Comanche Peak operating license hearings before the Atomic Safety and Licensing Board which raises questions concerning the adequacy of independence maintained between the CYGNA staff and the TUGCO staff during the course of CYGNA's review.

1. We understand that CYGNA gave the TUGCO advance notice of the documentation needed to conduct CYGNA's review. These documents were then used to ascertain the accuracy of documentation control paperwork as well as the adequacy of control of document distribution (Tr. 9368-9372).

2. Based on the transcript (Tr. 9377-9382), it appears that CYGNA did not follow the protocol attached to my letter to Mr. Gary dated September 23, 1983 with respect to notice of all meetings between TUGCO and CYGNA.

We would like CYGNA's comments on these matters and CYGNA's assessment of whether these matters affect the adequacy of the independence maintained by CYGNA during its review. We would also like the separate comments of TUGCO on these matters, and TUGCO's assessment of whether these matters affect the adequacy of the

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independence of CYGNA's review. In addition, we require CYGNA's assessment of whether its review was fully independent, with a detailed basis for CYGNA's conclusion. In any areas in which CYGNA's review was, in their view, not fully independent, we wish their assessment of how such matters may affect any conclusion drawn by CYGNA.

Full responses will be important in NRC assessment of the degree to which we feel we can rely upon the CYGNA evaluation and report to provide the NRC staff with additional assurance that the Comanche Peak plant has been designed and constructed in accordance with the application and NRC Regulations.

Sincerely,

Darrell G. Eisenhut

Darrell G. Eisenhut, Director
Division of Licensing

cc: See next page

-IMR

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

MAR 30 1984

Docket No. 50-445

Mr. M. D. Spence
President
Texas Utilities Generating Company
400 N. Olive St., L.B. 81
Dallas, Texas 75201

Mr. L. L. Kammerzell
Vice President
CYGNA Energy Services
101 California Street
Suite 1000
San Francisco, CA 94111

Dear Mr. Kammerzell:

Subject: Independent Assessment Program (IAP) Performed by CYGNA

As a result of our review of the November 5, 1983 draft CYGNA report of its Independent Assessment Program (IAP) for the Comanche Peak Steam Electric Station, Unit 1, the NRC staff has a number of questions which we would like to discuss with the CYGNA reviewers. The specific matters are described in the enclosed request for additional information.

We believe that a meeting in approximately two weeks would be appropriate. Mr. Burwell, the NRC Project Manager will contact your staff and the CYGNA project manager in the next few days to schedule such a meeting. All explanations, assessment or other additional information provided at the meeting should be subsequently documented in the final CYGNA report or by a supplement to the report.

Sincerely,

Darrell G. Eisenhut, Director
Division of Licensing

Enclosure:
As stated

cc: See next page

Contact: S. Burwell
(301) 492-7563

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Mr. M. D. Spence
President
Texas Utilities Generating Company
400 N. Olive St., L.B. 81
Dallas, Texas 75201

cc: Nicholas S. Reynolds, Esq.
Bishop, Liberman, Cook,
Purcell & Reynolds
1200 Seventeenth Street, N. W.
Washington, D. C. 20036

Robert A. Wooldridge, Esq.
Worsham, Forsythe, Sampels &
Wooldridge
2001 Bryan Tower, Suite 2500
Dallas, Texas 75201

Mr. Homer C. Schmidt
Manager - Nuclear Services
Texas Utilities Generating Company
2001 Bryan Tower
Dallas, Texas 75201

Mr. H. R. Rock
Gibbs and Hill, Inc.
393 Seventh Avenue
New York, New York 10001

Mr. A. T. Parker
Westinghouse Electric Corporation
P. O. Box 355
Pittsburgh, Pennsylvania 15230

David J. Preister
Assistant Attorney General
Environmental Protection Division
P. O. Box 12548, Capitol Station
Austin, Texas 78711

Mrs. Juanita Ellis, President
Citizens Association for Sound
Energy
1426 South Polk
Dallas, Texas 75224

Mr. James E. Cummins
Resident Inspector/Comanche Peak
Nuclear Power Station
c/o U. S. Nuclear Regulatory
Commission
P. O. Box 38
Glen Rose, Texas 76043

Mr. John T. Collins
U. S. NRC, Region IV
611 Ryan Plaza Drive
Suite 1000
Arlington, Texas 76011

Mr. Lanny Alan Sinkin
114 W. 7th, Suite 220
Austin, Texas 78701

B. R. Clements
Vice President Nuclear
Texas Utilities Generating Company
Skyway Tower
400 North Olive Street
L. B. 81
Dallas, Texas 75201

William Burchette, Esq.
Law Office of Northcutt Ely
Watergate 600 Building
Washington, D. C. 20037

Ms. Billie Garde
Government Accountability Project
1901 Q Street, N. W.
Washington, D. C. 20009

Ms. Nancy H. Williams
CYGNA
101 California Street
San Francisco, California 94111-5894

MAR 30 1984

REQUEST FOR ADDITIONAL INFORMATION

FROM CYGNA RELATING TO THE

CYGNA INDEPENDENT ASSESSMENT OF THE

COMANCHE PEAK STEAM ELECTRIC STATION, UNIT 1

1. In two related observations (DC-01-01 and DC-01-02), CYGNA found that design changes generated against drawings and specifications were not adequately recoverable by the document control system. In the observation record review for these two observations, CYGNA described its reinspection of the document control system after the applicant had made improvements. CYGNA closed these observations based on their confidence that the newly developed computerized document listing is accurate with respect to design changes outstanding against affected design documents and that adequate programs have been put in place to assure that the plant is constructed in accordance with the design and associated design changes. However, the CYGNA Report did not provide a discussion on the adequacy of the document control system to assure the plant was constructed in accordance with all design changes prior to the introduction of the computerized document listing system. Secondly, the CYGNA Report did not provide information (data) on the adequacy of the document controls on piping and pipe supports which were not included in the computerized document listing at the time of the CYGNA reinspection.

   CYGNA should provide an adequate explanation or assessment on how the document controls assure that design changes and inspections made prior to the availability of the computerized document listing are resolved in a manner which assures that the plant is constructed in accordance with the design and associated design changes. The NRC staff is considering requiring an additional assessment by CYGNA of whether the implementation of the applicant's present document control system does identify and make available all outstanding design change documentation as may be needed in the inspection of systems and components, especially the outstanding design changes associated with the piping and pipe supports.

2. In observation PI-00-01, the applicant's piping designer (Gibbs & Hill) did not specify any weld mismatch (δ) when determining the stress intensification factor for as-built girth butt welds. Consequently, a stress intensification factor of 1.0 was used in the piping analyses. CYGNA was concerned that the use of a stress intensification factor of 1.8, which is specified in the ASME Code in Figure NC--3673.2(b)-1 for a wall thickness (t) less than 3/16 inch or a mismatch ratio (δ/t) greater than 0.1, could result in exceeding the allowable stress limit. For welds with a wall thickness less than 3/16 inch, the applicant used a stress intensification

factor (SIF) of 1.8 as required. For welds in piping with wall thicknesses greater than 0.237 inch the stress intensification factor was also shown to be acceptable. However, the NRC staff does not find that an adequate justification was provided to allow the use of an SIF equal to 1 for girth butt welds between straight piping with wall thicknesses between 0.1875 and 0.237 inch. CYGNA should provide an adequate explanation of whether girth butt welds between straight sections of piping (sizes 3 and 4 inch, schedule 40) conform to the ASME Code requirements for welded joints.

3. In observation PI-00-02 CYGNA noted that the applicant's piping designer uses a 20 percent increase in the upset and emergency condition allowable stresses when considering localized stresses in welded attachments in combination with general membrane and bending stresses. CYGNA concluded that the observation was closed based upon a finding that later codes allow the use of stress indices which result in an increase in the allowable stresses for upset and emergency conditions. CYGNA should provide an adequate explanation on whether the use of the 20 percent increase in allowable stresses consistently results in calculated design stresses which are within the stresses allowable under more recent Code Cases for all welded attachment designs and materials.

4. With regard to the design review of cable tray suports, the allowable stresses table (Exhibit 4.3-1) is arranged to provide allowable stress values for operating and safe shutdown conditions. However, no values are provided for many safe shutdown conditions. The NRC staff believes CYGNA should revise the report to provide the missing values.

5. In the design of the 40 cable tray supports within the CYGNA scope of review, construction drawings for each support were prepared in the field from the 15 standard designs prepared and analyzed by the architect-engineer. CYGNA should describe how it verified that construction drawings have been correctly prepared from the 15 standard design drawings.

6. With regard to design review of electrical, instrumentation, and control systems, the NRC staff reviewed the CYGNA criteria and checklists for the electrical design review (CYGNA Report, Appendix E, Document No. DC-5, Sections 2.0, 3.0, 4.0 and 5.0) to determine the adequacy of the criteria for assuring compliance with NRC regulatory requirements. The NRC staff notes that the review criteria did not include NRC Regulatory Guide 1.106 relative to bypassing of motor overload protection circuits and NRC Standard Review Plan Section 8.3, Appendix 8A, Branch Technical Position ICSB 18(PSB) relative to the single failure of safety related valves. The NRC staff could not determine whether these two regulatory guidelines were included in the electrical design review of the valve control circuitry. CYGNA should supplement the design review criteria and checklist for this valve and assess the design of the valve control circuitry against these two regulatory guidelines, or otherwise justify their omission.

7. One observation (MD-02-02) addressed a concern that some snubbers were installed 180° from the configuration shown on the piping support drawings. CYGNA closed this observation based on a procedure which indicates this installation is acceptable since the snubbers will still perform their intended function. This procedure should be identified in the checklist.

TEXAS UTILITIES GENERATING COMPANY
SKYWAY TOWER • 400 NORTH OLIVE STREET, L.B. 81 • DALLAS, TEXAS 75201

Log # TXX-4134
File # 10010

April 2, 1984

Mr. B. J. Youngblood
Chief, Licensing Branch No. 1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION
INDEPENDENT ASSESSMENT PROGRAM PERFORMED
BY CYGNA

Dear Mr. Youngblood:

Texas Utilities has reviewed your concern regarding the containment sump isolation valves and the two recommendations made in the CYGNA IAP Report regarding: (1) that a standard instruction be prepared for the design, revision and review of cable tray supports and, (2) that the anchor bolt embedment lengths be deleted from the support drawing. In addition, Texas Utilities is presently reviewing the CYGNA IAP Report and any formal comments will be submitted to the NRC Staff and to CYGNA in the near future.

Containment Sump Isolation Valves

The NRC Staff requested that Texas Utilities review the control and interlock mechanisms of the containment sump isolation valves (1-8811A/B). In the CYGNA IAP Report Appendix H, Checklist Number EE-02 reviews the control circuitry of the containment sump isolation valves for compliance to FSAR Chapter 7. Although the valve 1-8811B is not directly interlocked to a RCS pressure setpoint of 425 psig, CYGNA indicates that such and interlock exists.

During the injection mode, the RWST/RHR pump suction isolation valves are open and allow flow to the RCS. These valves can only be opened if the containment sump isolation valves are closed. The containment sump isolation valves open automatically when two of four refueling water storage tank level signals are less than the lo-lo-1 level setpoint, coincident with an engineered safety feature actuation signal (S signal). Furthermore, the design allows for automatic switchover from the ECCS injection mode to the recirculation mode during an accident. Operator action is required to close RWST/RHR pump suction isolation valves 8812A/B immediately following the opening of the containment sump isolation valves (cold leg recirculation mode)..

In addition, the containment sump isolation valves must be closed before the RHR system can be aligned to the RCS hot leg during a normal cooldown. The RCS pressure must be below approximately 425 psig before the RHR isolation valves will open. Thus, the containment sump isolation valves are interlocked so that they must be closed before the following valves can be opened:

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1. RWST/RHR pump suction isolation valves (8812A/B);

2. RHR inner or outer isolation valves 8701A, 8701B, 8702A and 8702B. (below 364 psig RCS pressure setpoint)

FSAR Section 7.6.2.1 describes the control logic of the inner and outer RHR isolation valves (8702A/B and 8701A/B). These valves are normally closed and can only be opened after the RCS pressure is reduced below approximately 425 psig and the containment sump isolation valves are closed. Additionally, the RHR system is only used for conditions below approximately 425 psig and 350°F. Thus, the design of the RHR system precludes the exposure to high pressure.

The CYGNA comment regarding a direct interlock between the containment sump isolation valve and RC pressure is not clear and should be clarified or reworded. The design of the control and interlock circuitry for the recirculation sump isolation valves, RHR isolation valves and RWST/RHR pump suction isolation valves is correct and there is not a 425 psig RCS pressure permissive required to open the recirculation sump isolation valves.

Standard Instructions - Cable Tray Supports

A standard set of instructions for the design, revisions and review of cable tray supports as suggested by CYGNA is being prepared and will be provided to CYGNA prior to May 1.

Anchor Bolt Embedment Lengths

CYGNA suggested that anchor bolt embedment lengths should be removed from pipe support drawings. This suggestion was made to ensure that there would be no confusion between the embedment length shown on the drawing and the embedment length used for design calculations.

Installation procedure CEI-20 (Rev. 9, 12/16/83), "Installation of 'Hilti' Drilled-in Bolts" requires that anchor bolts be embedded to a minimum depth below the surface of the 4000 psi (28-day strength) structural concrete prior to setting (torquing). A table in the procedure provides the anchor bolt diameter and the minimum embedment length for Hilti-Kwik and Super Kwik-Bolts. (The minimum embedment length is approximately 4½ times the diameter of the bolt for Kwik-Bolts and 6½ times the diameter of the bolt for Super Kwik-Bolts).

The instruction has been revised to state that the minimum embedment length shall be that specified in the anchor bolt installation procedure and that specified on the drawing. Quality control procedures ensure compliance to these instructions.

Original design calculations to ensure adequate qualification of the anchor bolt design assumes the minimum anchor bolt embedment lengths required based on the CEI-20 procedure. If, for an initial calculation, a greater embedment depth is necessary than required by the CEI-20 procedure, the required depth is indicated on the design drawing.

Furthermore, if for any reason (re-analysis, "as-built" verification, etc.) loads are high and a deeper embedment length is necessary than provided by the initial calculation using the minimum embedment lengths in the CEI-20 procedure or on the design drawing, then a calculation can be made to determine the minimum installed embedment length based on the actual bolt length. This calculation is done by knowing the actual length of the bolt and subtracting the thickness of the concrete topping (if any), steel plates, washers, and assuming the nut is fully torqued at the bottom of the threaded run of the bolt. This provides a conservative estimate of the installed embedment depth. This depth can then be used in load calculations to determine the adequacy of the pipe support design. The engineer can also have a field verification made to determine the actual embedment depth, if necessary.

Although the design support drawings and Installation Procedure CEI-20 provides a minimum embedment length required, the design calculations can be based on a conservative estimate of the actual embedment length. Therefore, there may be differences between the drawing minimum embedment length and the embedment length used in the calculations, but, as CYGNA rightly states, the differences has no design impact. We feel that no further changes are required.

Summary

Texas Utilities will provide formal comments regarding the CYGNA IAP Report. In addition, a standard set of instructions for cable tray support design, review and revision will be provided to CYGNA prior to May 1.

If there are any questions regarding the remaining concerns or those discussed above, please contact us.

Very truly yours,

H C Schmidt

H. C. Schmidt
Manager, Nuclear Services

HCS/grr