UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of:

MEETING WITH PACIFIC GAS & ELECTRIC COMPANY
ON DIABLO CANYON

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

MEETING WITH PACIFIC GAS & ELECTRIC COMPANY
ON DIABLO CANYON

California Room
Sheraton Palace Hotel
639 Market Street
San Francisco, California

Monday, April 2, 1984

The meeting in the above-entitled matter convened at 9:00 a.m., Hans Schierling presiding.

PRESENT:

Hans Schierling

Ted SUllivan

Bernie Soffell

Robert Bosnak

Jim Knight

Richard Vollmer

Jim Taylor

Robert Heishman

Robert Falukenberry

Dennis Allison

Kamal Manoli

Isa Yin

R.L. Cloud

Bruce Norton

George Maneatis

Howard Friend

Bob Oman

Larry Shipley

Mike Tresler

Dave Tateosean

Tom Dillriarte

Ed Kahler

Mike Jacobson

Tom Esselman

John Hoebel

Dave Alsing

P R O C E E D I N G S

MR. VOLLMER: Good morning. This is a meeting between the Nuclear Regulatory Commission Staff and Pacific Gas and Electric Company on the Diablo Canyon project.

My name is Richard Vollmer. I'm Director, Division of Engineering in the Nuclear Regulatory Commission.

The meeting was called on short notice and I would like to recount the events leading up to the meeting for the purpose of getting everybody up to speed.

Last Monday and Tuesday at the meeting of the Nuclear Regulatory Commission, the meeting was to consider the Diablo Canyon project and the issuance of a low power license. During these meetings, a member of the NRC staff, Mr. Isa Yin, identified concerns which led him to the conclusion that the Unit I reactor should not be permitted to go critical at this time.

The Commission decided that these issues should be reviewed further, and that the Advisory Commission on Reactor Safeguards -- the Advisory Committee on Reactor Safeguards, should also review and report to the Commission on these issues.

On Wednesday of last week, at a public transcribed meeting, Mr. Yin identified to Pacific Gas and Electric and the NRC staff in more detail his concerns which are contained in a preliminary inspection report. Since it is a preliminary inspection report, it had been held confidential, it had not

been made available to the public or to the licensee. We hope that this report may be issued and be available for public review. We may know a little bit later about that, this afternoon.

The purpose of that particular meeting was to allow PG & E the opportunity to hear and review the issues and respond to them.

On Thursday of last week, the executive director for operations, Mr. William Dircks, requested a staff review of these issues to assist the ACRS in their deliberations, and also to advise him. Since the ACRS is to meet on this subject this coming Friday, the staff review needed to be initiated immediately, and that's why we're here on short notice.

Mr. Dircks asked that the staff review identify the overall impact that these issues would have on the safety of low power operations, and that the review should also consider where appropriate the generic significance of the issue. So we would like to try to, first of all, certainly understand PG & E's view of the issues, but the focus will, we hope, be on any significance with regard to low power operation, and also, any generic significance and we would like to take the issues somewhat as a whole rather than parceling out each individual issue. It's hard to perhaps assign broader significance to them individually.

We formed a review group in response to Mr. Dircks'

request, and I'll introduce this group in a moment, to consider as a whole the issues raised by Mr. Yin and their implication to low power operation at Diablo Canyon. We met as a group with Mr. Yin last Friday to discuss the issues, and we're here today to do likewise with Pacific Gas & Electric.

This, then, is a meeting between -- essentially between this review group that was formed to consider these issues, and PG & E. And we will look for them to provide whatever information that they feel is appropriate in this regard.

The meeting today is being transcribed, and that transcript will be made available. Mr. Scheirling, in a minute, we'll give you details on that.

Okay, I might also add for everybody's information that the intent here is not to close out the issues raised in this inspection report. The purpose of the meeting here today is to try to focus for the benefit of the ACRS on the significance of the issues as they deal with low power operation. Since they are part of an inspection report, all these issues will be closed out in the normal process.

Also, at the conclusion of the meeting, representatives of parties to this proceeding may make statements for the record, and it would be helpful if perhaps anybody wished to do so, they would notify Mr. Scheirling at one of the breaks.

Now, let me introduce the review team that has been formed for this process. To my immediate right is Mr. Jim Taylor. He is the deputy director of the Office of Inspection and Enforcement.

To his right is Mr. Bob Heishman. He is in the Office of Inspection and Enforcement, Chief of Reactor Programs.

Next to him is Bobby Faulkenberry, who is deputy regional administrator of Region V.

Next to him is Dennis Allison who is a section chief in Inspection and Enforcement.

Next to him is Mr. Kamal Manoli. He is an inspector with Region I.

And although not part of the review team, next to him is Mr. Yin.

On my immediate left, and going down the row is Mr. Jim Knight. He's an assistant director in the Division of Engineering.

Next to him is Mr. Bob Bosnak. He's the branch chief of the Materials Engineering Branch in the Division of Engineering.

Next to him is Mr. Bernie Soffell who is a consultant from Bechtel Columbia Laboratories.

Next to him is Ted Sullivan. He's my technical assistant in the Division of Engineering.

And also not on the review team, but at the far end

of the table is Mr. Hans Schierling, project manager of the Diablo Canyon project.

Before I turn the meeting over to P G & E for their presentation, I'd like to ask Hans if he has any announcements to make.

MR. SCHIERLING: As Dick indicated, this is a meeting that is open to the public, and the transcript will be taken. We expect that the transcript will be available either later on today or tomorrow morning. Parties can do an order from the recording company for the transcript. The staff will go and make the transcript available through our normal process.

I will be sending around an attendance sheet that please, everybody who is not sitting at the table will sign. While we are taking -- during the meeting, please have only one person talk at a time because otherwise we will not end up with an intelligent transcript.

I would also like to mention that if there are any prepared statements or copies of handouts, I request that I will be given a few extra copies because they will be made part of the transcript.

That's all I have to say, Dick.

MR. VOLLMER: Okay, thank you. I'll ask Jim Taylor. Do you have anything?

MR. TAYLOR: No, I don't.

MR. VOLLMER: Jim Knight? Okay, then I'll turn the meeting over to Mr. George Maneatis of Pacific Gas and Electric for your presentation.

MR. MANEATIS: Thank you, Mr. Vollmer. I'm George Maneatis, executive vice president, Facilities and Electric Resources Development for Pacific Gas & Electric Company.

We're here today to respond to the observations made by Mr. Yin at the last Wednesday's meeting, and we expect that our presentations and responses will take more than a normal working day, so we're prepared to spend as much time as needed to respond fully to Mr. Yin's and this guest's observations and questions.

On my left is Howard Friend, Diablo Canyon Project Regional Manager. We will begin our meeting with some brief introductory remarks and proceed from there. Howard?

MR. FRIEND: Thank you, George. As you mentioned, we're here to discuss the Diablo Canyon Project on the observations expressed by Mr. Yin on last Wednesday, March 28th. As many of you are aware, at that meeting, there was some 47 observations from recent NRC inspections of the Diablo Canyon project.

We carefully reviewed the transcript of that meeting to achieve a clear understanding of all of these observations. We will attempt today to address each of these observations. We believe that some of these items have already been addressed

in our previous submittals to the NRC. And we will be referring to some of those submittals as we go through our responses.

We plan to go through a point by point response to each of the items in the same order that they were given to us. In particular, we will discuss the items as they have been categorized in accordance with the criteria of Appendix B 10 CFR, Part 50.

The criteria that were included in Mr. Yin's points included Criterion II, XVI, VI, V, III, XVIII and VII, in the order that he presented them.

I'd like to take just a few minutes to set the stage for our discussions. To emphasize a point that I believe is central to the understanding of our work on Diablo Canyon project. In a traditional piping design job, the engineer starts with a clean sheet of paper that allows him a number of options in accomplishing the design. After initial piping layout, and supporting system is completed, a stress analysis of the piping is performed. If the analysis shows that the piping exceeds allowable -- code allowables, the designer may reroute the pipe, add or change supports, relocate equipment or valves, or take any other measures that are available to him to generally optimize the design.

In the Diablo Canyon Project and the on-site project engineering activities, the situation is quite different. First, the pipe and all the supports were already there.

The existing installation had gone through the very complex review and coordination process for -- coordination for interference with other disciplined commodities, for compatability with equipment. Various reviews had been made such as system interaction reviews, fire protection reviews, separation reviews. So it was very important for us to maintain the configuration of the piping in the plant to maintain the integrity of all these prior reviews.

Therefore, in order to maintain the validity of all of this prior work, we imposed on the designers a requirement to maintain as much as possible the configuration of the pipe as it existed in the plant. We required the designer to operate under these constraints that would not normally exist.

It was due to these imposed restraints that we find analyses repeated several times to finally show load acceptance, that we use sometimes computer analyses, and other extraordinary techniques to demonstrate that stress has met the Code allowables.

I hope that you'll keep this in your mind as we go through and discuss these matters today, because I think it is central to understanding the approach that was taken on the Diablo Canyon Project.

I'd now like to introduce the panel that will present our response to the various points made by Mr. Yin. And we will be prepared to discuss any of the observations in

further detail as we go through our responses.

At the end of the table is Dr. Robert Cloud of Robert Cloud and Associates. He represents the independent design verification program. and was in charge of the IDVP work in reviewing piping for Diablo Canyon Project.

Next to Dr. Cloud is Mike Jacobson and he represents -- or he is the project quality assurance engineer on the project. He's with Bechtel.

Next to Mike is Mr. Ed Kahler from P G & E. He represents the project quality engineering group.

Next to Mr. Kahler is Mr. Tom DeUriarte from the PG&E quality assurance department.

One of our members hasn't arrived yet. In the empty chair will be sitting Mr. Dave Tateosean. He's a senior member of our piping design group.

Next in line is Mr. Mike Tresler. He's an assistant project engineer and formerly was the supervisor of our piping design group.

Next to him is Mr. Larry Shipley. He's the assistant chief plant design engineer for Bechtel Power Corporation in San Francisco. And he was a project piping design consultant for the Diablo Canyon Project.

Finally, on my immediate left is Mr. Bob Oman. Bob was formerly the onsite project engineer in charge of the engineering group onsite at Diablo Canyon. He is now an

assistant project engineer for systems development on the project here in San Francisco.

On my -- on the extreme right is Mr. Bruce Norton. He's our licensing attorney who has been helping us over the years in the licensing activities before the Commission.

So with that, I'd like to turn the meeting over to the panel to address the first of the criterion, which is Criterion II.

MR. VOLLMER: Howard, if I may, just a second, how long do you anticipate the presentations will make because we'd like to keep the flow such that we can ask questions when they're current.

MR. FRIEND: That's our plan, Dick. I believe our presentation in total will take a number of hours, maybe three to four hours. But we do plan, and think the best way to approach this is to ascertain -- after we discuss the criterion, say, then to entertain questions and discussions from you to clarify or whatever before we go on to the next item.

MR. NORTON: We talked about how to present this quite a bit over the weekend, as you might guess, and there are a number of these that are very closely related. For example, there might be three or four that deal with the very same thing, and what we intend to do is that the person who addresses it will tell you that he's addressing these things. It might be Criterion III, Item 4, and Criterion VIII

or V, Item 6, and so on. And he will tell you that and he will give a short presentation, and then all of those would be open for questions and discussion, so there will be some consolidation. The presentations are really summaries, and they shouldn't be very long, individually.

MR. SCHIERLING: Okay. Before we go any further, would please the members of the panel and also of the NRC staff, for the first hour or so, whenever you speak, introduce yourself for the first few times because number one, we have a new recorder that doesn't know us, and number two, many of us are new to each other, too. So please identify yourself at least three or four times so that we don't have to search through the record later on.

THE REPORTER: If I could say one thing, too. These mikes do not amplify your voice. They're solely for the tape. So for that reason, you'll all need to speak up.

MR. KAHLER: Good morning, my name is Ed Kahler. I'm responding to the criteria of two items. Under this we have two items. The first one we'll categorize into two subgroups. Item A, there was inadequate provision for the -- in the program for personnel indoctrination and training. The small bore piping support engineers were not familiar with the important elements in both QA and technical programs.

Item B, the program should have allowed people to work only if they are trained, not specified with specific

time frames.

In response to Item A as Mr. Yin stated in his March 28th testimony, he concluded that our latest training program appeared to be adequate. But raised questions as to the adequacy of the previous training programs.

The current program consists of basically a four-hour orientation in the engineering manual procedures, and in the indoctrination of the quality assurance progrm. The trainee is advised of the content of the manual. There are arrangements, the subjects covered by the individual procedures, various forms are used as examples, and the context of each procedure is described with the use of the forms.

The training is not directed to achieving technical proficiency. It is quality assurance procedure training. The current training program that we use today is substantially the same as it has been since the inception of the project. We have, what we consider, some refinements in the presentation of the material, and the handouts that we provide to the trainees as part of the program.

Mr. Yin asserted in this area that QA training had been suspended from 1982 until May of 1983. The present Bechtel program requires quality assurance training of all new employees.

In 1983, an element was added to -- where the indoctrination of the PG & E personnel to the Bechtel quality

assurance program. This has been incorporated as part of our affirmative training program, and is given to all employees who attend the training program.

Mr. Yin presumably drew his conclusion that the OPEG training is inadequate based on interviews with personnel. We feel that such interviews are not the most reliable indicator of training effectiveness. We feel that the most proper indication is the employees' familiarity with the technical programs and in the adequacy of the design.

Based on Mr. Yin's review and our own reviews of all the OPEG work, we have not found any instances where we have had to do any modifications to the equipment in the field. We feel that the ultimate quality of the end product is not totally attributable to the procedural and quality training as I previously discussed. We feel it's basically the technical adequacy of the engineers who are assigned to do the work.

In our February 7th submittal to the NRC, we provided basically this same rationale. We have hired experienced technically qualified engineers. And in an evaluation of the onsite project engineering personnel, more than 41% of those people had greater than five years' experience in nuclear related projects. Most of them had worked on two or more projects and all of them had at least a B.S. in engineering, or an equivalent. And their professional experience ranged

from one year to about 14-½ years. The average professional experience of the onsite engineering group was over five years.

We don't feel that the technical training required for experienced engineers is the same as that -- as an example where you would take a high school graduate, and train him to be a qualified welder. We hire people who are experienced and train to come onto the project and do work for us.

MR. VOLLMER: Mr. Kahler, if I may interrupt for a minute. You were -- gave instances and reasons why you felt that the training was not an important aspect. Could I ask this question? Do you feel that the -- even though your procedures call for this training that the training was really not needed? Is that what you're saying here?

MR. KAHLER: No, sir, I'm not. The training that's provided in the engineering manual is basically the responsibilities of the individuals for what they should be doing. For example, the responsibilities of the person who prepares the calculation, the responsibilities of the checker of a calculation, and how to package the completed calculations so that it is in a quality acceptable document, cover forms, approvals, sign offs, that type of data. But no, sir, the quality program training is an important aspect.

MR. VOLLMER: Thank you.

MR. TRESLER: I'd like to add something to that. I'm Mike Tresler. In addition to training, I think we have

to understand that we've prepared some pretty detailed procedures and instructions which implement, and are easily accessible to the engineers, the requirements which are contained in the training program. So really, we're providing the information in more than one way.

MR. TAYLOR: My name is Jim Taylor. I'd like to ask whether the company expanded on the findings that Mr. Yin brought to your attention. That is, do you -- he interviewed half a dozen or so people. And you acknowledge that there seem to be gaps in the training in terms of the process and procedures. Have you gone further to review that with other engineering staff in the OPEG group to see whether it extends further than he indicated with his results?

MR. JACOBSON: I'm Mike Jacobson. Yes, we did. Project QA did a complete review of the training records of the engineers at OPEG. We did find some additional cases where engineers did not receive training, and there is a requirement -- this is addressed in our February 7th submittal. We did not find the same rate of discrepancies that Mr. Yin found. In fact, we found that during the latter part of the project, most people did comply with the 30-day requirement.

MR. TAYLOR: Did you -- you emphasized that part of the training and the process was the use of the up to date procedures and approaches in doing the calculational work, and the technical work. Did you -- there were instances that

Mr. Yin pointed out where people had out of date procedures. Did you go further in this look at the engineers and the people working to see that that situation didn't prevail further, and that indeed people were working to the latest criteria?

MR. KAHLER: Yes, sir, we did. That's discussed later as another item. And is addressed, this assertation.

MR. TAYLOR: Okay.

MR. VOLLMER: Following up on the training part, since you indicated the training was fairly brief, what was the rationale behind the procedural requirement for 30 days? In other words, why wasn't the training initiated when the person was put on the job, rather than have a 30-day procedural requirement? And the second part of my question is, were there any specific instructions given to the supervisors of these -- the OPEG people so that they would be required to be briefed in the administrative aspects of their job wher they first initiated work?

MR. KAHLER: As is described in our engineering manual, Procedure 2.1, it identifies that prior to performing quality assurance functions, which may affect the final status of designer construction activities, there should be training. We used it, an interpretation of 30 days should be a reasonable period of time in order to get these people trained. We have also found that it is often more informative to the employee attending the training session if he has had an opportunity

to be in the group, see how the group operates, has a chance to look at the material that has been compiled, and some experience with working with that. That way, when he goes in and they start talking about a procedure on calculations, he's seen a calculation, he knows generally what it looks like he's -- he can relate to the material that's being discussed within the training session.

MR. FAULKENBERRY: This is Bob Faulkenberry. Dick, I'd like to follow up on your question a little bit. First of all, what kind of system did you have to assure that the engineers had completed their training before doing safety-related work? Did you have any control over that?

MR. KAHLER: Not as a direct review control.

MR. FAULKENBERRY: Okay, the second question, you said that your review showed that some engineers had not received training until the end of the 30 days. Can you give us any numbers of -- do you have any way of telling how many engineers did safety-related work prior to the receipt of the indoctrination training?

MR. JACOBSON: The review we did was to the thirty days. We did not go back in each case and review each engineer and see if they had, for example, initiated a calculation in the initial 30-day period. But, with that review, I believe we found that 70% of the people on the current OPEG roster had received training within the 30 days. And most of the

others would have been four months.

MR. FAULKENBERRY: Did you say 70%?

MR. JACOBSON: Yes, sir.

MR. KAHLER: Also, as stated in our February 7th submittal, we did do an investigation of the types of errors that were found in the calculations. And as to examine it as to whether indoctrination training or professional experience would have been a cause of these errors, and our conclusion was that it appeared to us to be a rather random event, and we could not attribute it to any of those three areas explicitly.

MR. VOLLMER: In other words, what you're saying is the training was not in -- or the errors were not in areas that the training was part of the indoctrination?

MR. KAHLER: No, sir.

In response to Item 2 -- or, I guess Item B under Criteria II, Item 1, we no longer have a 30-day window. We have revised our procedures which now require that the training will be given to engineers before they do any type of work on the project.

We've also looked at the discrepancies in the calculations, the errors, if you will, and we have not been able to correlate the errors with the people who did or did not receive timely training.

Mr. Yin also is apparently extrapolating the training concern from the small bore area into the large bore

analysis area. We do not feel that that is necessarily a good extrapolation. And a large bore analysis was done in San Francisco where we had specialists more readily available for consultation. We also had a special experience group of engineers who did a review a third review, after the checking of calculations in the large bore support design calculations. This was an added thing that we did for the large bore because we recognized that basically the large bore -- the difference in operating with a one-inch line in supporting interest, the 20-inch line in supporting it, the loads are much greater. The apparent more importance to the failure in that area.

MR. VOLLMER: Okay, I understand that. Were the training requirements similar for these people, however? Were they given this training in a timely fashion according to the procedures?

MR. KAHLER: The training program was basically the same program, or was the same program. Do you want to respond?

MR. JACOBSON: Yes, I was going to add that we've also performed a 100% review of the engineers in the San Francisco office, the large bore group. And there were some instances where engineers were not trained in the 30 days, but predominantly this was in the early period of the project prior to the 30-day requirement being promulgated.

MR. TAYLOR: I'm Jim Taylor. You mentioned the Bechtel process of checking the calculations on the large

bore, and then you mentioned a third review by a review group. Right, to the large bore supports? All right. Do you know how -- to what extent they reviewed the large bore support area, was it -- did the review extend throughout the work?

MR. TRESLER: Excuse me, I'm Mike Tresler. I think I understand your question, and Ed was not only addressing pipe supports, but he was also addressing piping analysis.

MR. TAYLOR: Right.

MR. TRESLER: And we did accomplish the work in accordance with the normal process of the doer and the checker and the independent reviewer. But in addition to that, we established special groups, one for piping analysis, one for pipe supports. We picked what we believed are some of the most qualified individuals and placed them in these groups. As an example, in pipe supports we had Dr. Thaler as one of our reviewers. And they reviewed these calculations in detail, the detail that they judged necessary because a simple pipe support review is not extremely detailed, and as it became more complex, the review was more thorough.

The review was not even limited to technical. It was also limited to format, and proper signatures and so on. And this review is above and beyond the checker review.

MR. TAYLOR: Do you know how much they looked at, though, in terms of the packages? Did they look at percentage of the packages? Did they look at all --

MR. TRESLER: No, they looked at all packages, every calculation.

MR. TAYLOR: So that review looked at all the calculations?

MR. TRESLER: That's correct.

MR. HEISHMAN: I'm Bob Heishman. But that was, in fact, only the large bore?

MR. TRESLER: That's correct.

MR. HEISHMAN: I understand, okay. Thank you.

MR. KAHLER: This is Ed Kahler. And just as an amplification on that, Mike, I believe they looked at all of the calculations, but they did not look at all of them in the same detail.

MR. TRESLER: That's what I said. Depending on the complexity of the analysis.

MR. SCHIERLING: Mike, we can not hear you.

MR. TRESLER: It depended on the complexity of the analysis as far as the depth of the review performed by these special groups.

MR. FRIEND: Mike, would also add a comment as to the -- this group's review of the contractor's calculations?

MR. TRESLER: The contractors, Impell & Cygna, were included in these reviews.

MR. FRIEND: Thank you.

MR. TRESLER: I was not limiting it to DCPO.

MR. VOLLMER: How would you characterize that since it wasn't part of the design control review? It was a technical audit or an overview of the adequacy -- technical adequacy of the calculations?

MR. TRESLER: We realized the importance of Diablo Canyon. We felt we had to produce a product that was really beyond question. We knew we were going to be under very careful scrutiny by the IDVP and obviously, the NRC, as well as the responsibility to do a proper job. And the work was done over a relatively short period of time. We brought in a lot of people and so on. And we felt there was a need for additional confidence beyond what the normal process would allow, and that was the purpose of establishing these groups.

MR. TAYLOR: This is Jim Taylor again. Do you have any idea or can you characterize for us the sort of errors that were found by this last review group, and whether they were significant, whether they required any redesigns or beefing up?

MR. TRESLER: May I have a moment?

MR. VOLLMER: Yes.

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MR. TRESLER: The way I characterize it is that in the initial stages of the design and analysis effort, the rejection rate was fairly frequent, however, the way I understand it, the rejections were primarily for format. Maybe assumptions weren't documented, that sort of thing, although there were rejections on a technical basis also.

And, in the later stages of the project, the rejections were very frequent. Does that answer your question?

MR. TAYLOR: Yes, did any of them require then going back and rerunning the --

MR. TRESLER: Certainly, certainly.

MR. KAHLER: Again, my name is Ed Kahler. I'll be addressing the item 2 under Criteria 2.

This observation is characterized as supervisors did not advise subordinates of the requirements of new procedures or the revisions to existing procedures.

This observation is apparently developed from private interviews conducted by Mr. Yin of six pipe support designers in the OPEG group. OPEG is an acronym for the On-Site Project Engineering Group.

Mr. Yin had established that their supervisor had received training in two particular procedures, project engineers' instruction number 16 and revision 2 to

the Engineering Manual Procedure 3.60N which is the Operating Nuclear Power Plant design changes.

The particular training sessions that Mr. Mangoba attended on these two procedures, basically the project engineering instruction 16, added a form called the plant modification follower to it which was an additional form used for routing the design change package that they had been previously using. It was a routing slip, basically. That was the basic content of the PEI 16 training. The revision 2 to the engineering manual procedure 360N was a new section which permitted a design change notice for unit one to include a family of related changes and to describe how to control them. The other change in revision 2 to that procedure involved a clarification of requirements for approval of sketches attached to design change notices.

Mr. Yin apparently questioned the individuals whether or not their supervisor had discussed these two procedure changes with them by using the project engineers' instruction 16 number and the engineering manual procedure 360N number. They responded that they had no recollection of any such discussion and from this Mr. Yin concluded that Mr. Mangoba had failed to advise them.

First, we'd like to point out that the pipe support design engineers did not need to be familiar with the plant modification follower or the approval requirement

for sketches on DCN's. Again, the plant modification follower was a routing slip that was attached and the requirements for sketches or the approval of sketches was not applicable to them because they issued drawings. And, therefore, he most likely would not have discussed these particular changes with his people since it would not effect their work.

The second, assuming their supervisor had conveyed the information to them, he would most likely have discussed with them the changes they had to make in the normal work procedure rather than discussing them in the context of a particular procedure change.

We feel that this is the reason that they fail to recall the particular procedure numbers that they were asked if they had been -- if he had passed on the information.

It is the project's policy and practice to inform employees of procedural changes that effect their work. We use several methods. We use meetings, we circulate copies of the revised procedure and we issue memorandum and supervisors informing people of what they should be doing to fully document their work.

MR. VOLLMER: All right, if he did conclude then Mr. Yin would like to make a comment on what he's heard.

MR. YIN: My name is Isa Yin. I'd like to make a couple of statements before we wrap up this area. First of all, there are many people at the site that have received training several months after the required 30 days period. Even the 30 day period is not considered to be acceptable. How can anybody show up to work -- even though the people have a lot of years experience, many years of training working on the different sites -- but still, people showing up to work should know the specific requirements of that particular job, okay? So that training is what we're talking about, not the training to be a qualified engineer, but the training to know the specific requirements of the job, okay?

Now, in the area of special training, I did talk to six people. The six people that I talked to told me that they never received any specific training by his immediate or their immediate supervisor and that's the key point, not specifically on that one or two procedures that we're aduring on is in fact, they have never been trained before. They even have any formal discussion, talk about the things such as the trending of the problem. If there's any problem, we identify -- boys, let's not do it again, make sure you don't follow the same path as the other guy. Such as the thing is, we have an important procedure change.

The way it sets up, the procedures stack up some other ways. It is not a normal practice, everybody show up early in the morning and go to see if the procedure is changed today. If the supervisor do not tell the workers, hey, there's a significant procedure change, then how in the heck the people working would know this is a new requirement that we should follow from here on, and that's where we're coming from, okay?

MR. KAHLER: Yes, sir, I agree with your statement that if there are significant changes to procedure the supervisor should be passing on the information.

MR. YIN: There was any record at all? There was no documentation of anything, any of that that we can trace. From my end of the world, the people -- there's no such thing have taken place.

MR. KAHLER: We have provided and documented specialized training in cases where we have felt that the entire project needed to be upgraded on a procedure. The other training, where it affects particular small individual groups, we have basically left that training to the supervisor as his work instructions to them. And again, as we pointed out, there are meetings between these people, there is constant on the job kind of training between these people, we have issued memoranda and just the supervisor working with his people, reviewing their work

would certainly notice of things are being done different than the current procedure that's out.

MR. FAULKENBERRY: This is Bob Faulkenberry. Could I ask a question? Since this was probably minimal training, four hours, etc., is there any reason why you didn't have a system set up where the people when they reported on board, say the first day on the job who didn't get channeled into a four hour or eight hour specific instruction on how to do the job?

MR. KAHLER: We had set up an automatic notification system as to advise our training group that these people had it right. We had regularly scheduled classes and when the next class became available they were put in the class. We had scheduled them, I believe between a two to three week training schedule. We were training large numbers of people and we felt that was the most effective way to get the training to the people.

MR. FAULKENBERRY: Okay, I guess I'm still not understanding your response. If you had that frequency of training, why didn't you see more of the people? We're talking in terms of 70% receiving within 30 days and 30% within a four month period. I don't understand why you weren't more current with your training if you had that type of system set up and you implemented the intent

of the program.

MR. KAHLER: Sometimes you get in a situation where you schedule a specific training program on a certain day. The individual may be sick, on vacation, a number of personal reasons. We have run across cases where that particular person had been trained and he had been sent to the job site or from the job site to the office. They were scheduled for retraining. Notification letters were sent to both the individual and the supervisor that they had missed their training. We have had some cases where the notification process itself apparently did not work for some individuals.

MR. TRESLER: I'd like to address this. Mike Tresler. I think we've got to understand that we believe generally that the procedures and instructions that are provided to the engineers and are available in their work area provides for the most part adequate directions and I think totally adequate direction for accomplishing their technical work for performing calculations, determining acceptance criteria, specific requirements, that sort of thing. The training that is conducted is conducted to the procedures that they wouldn't probably be using as an every day part of their job. These are things like discrepancy reporting and that sort of thing.

In addition, the way in which calculations are

accomplished is in the standard format and that in itself to a certain extent controls exactly how the work is to be done.

Generally, and I'm not sure this is 100% true, it may be, Bob can confirm it but the people at the on-site organization prior to doing any work that was to be approved and issued for construction, they were issued sample problems and then reviewed those sample problems with their supervision to see that they were doing the job properly in accordance with our requirements and procedures. That is not a documented training program but it certainly leads to an individual qualified to do the duties he's assigned. The training is very broad in nature. You really have two categories of people down at the job site. Piping. One's a piping analyst. They have experience doing piping analysis. The other is more of a structural pipe support effort. The engineering methodologies used are more or less standard whether you talk about this plant or another plant. The differences are how we document it, the formats that we use to transfer the work that cite specific requirements including accepted criteria and these are established and maintained in design criteria in the case of pipe support it's M-9 and it's -- everybody, you can't avoid it and it's there.

MR. SHIPLEY: Mike, let me add something. My

name is Larry Shipley. From the technical point of view, in terms of technical training, as Mr. Kahler stated, we hire experienced people, people, engineers that had been doing this work at other job sites, they know their business. I believe, Mr. Kahler, you said it was five years average experience level?

MR. KAHLER: Yes.

MR. SHIPLEY: We do on the job training. The supervisor trains the new employee, although new means new to Diablo and not new to the process. He trains that person on the job, carefully checking the first work that he does. The acceptability of the final design seems to bear out the fact that the training was indeed adequate, the technical training was indeed adequate, since, from all the reviews we have done, we have shown in all cases that supports can be qualified.

MR. TAYLOR: This is Jim Taylor. The 30 day criteria was one established by your own procedures to meet the general quality assurance criteria of appendix B and, so, I presume that you thought when that was set up that that was an appropriate time to bring people into the various process controls and I assume if you're going to maintain that 30 day criteria that you are now seeing the people are being trained within the 30 day period. It was obviously meant to get people familiar with the

quality aspects of the projects, wasn't it -- the procedural aspects.

MR. KAHLER: That's correct and we have now amende d that 30 day program to require them to be trained before they start anything.

MR. TAYLOR: My obvious point is, if you had said five days, we'd expect you to mean five days.

MR. KAHLER: Yes, sir.

MR. VOLLMER: You also mentioned the hiring of well-qualified people and so on. There were also, besides procedural errors, some technical errors. Do you feel that these are in the norm, to be expected for well-qualified people doing this type of work, or, why don't you speak a bit to the technical area?

Larry, why don't you speak to that example that we talked about in the last couple of days?

MR. SHIPLEY: There was one example that, of a technical error, I believe that Mr. Yin found that was Hanger No. 99-20. That support was a relatively simple small bore support, a support that had attached to it six small bore pipes. Perhaps we should define small bore at the outset, that is, piping that is two inches in diameter and smaller.

There were six pipes attached to this particular support and the question that Mr. Yin raised was one of the

appropriate load point for application of the load from the piping, whether it's to be applied to the structure itself or an intervening member between the structure and the piping and the -- there was a clear disagreement between the structural analyst who had done the STRUDL model and Mr. Yin and his considered opinion so what we had was a difference in opinion and I personally believe that both of those judgements can be support. I believe that Mr. Yin's approach to the problem would have been extremely conservative. I believe that the analyst's approach to the problem was a reasonable representation of the piping and support when taken together.

So, when we went back and looked at the revision 1 to that particular hanger, we found that there were 19 places where the load point differed from what, from that at which Mr. Yin would have placed that load point; that was 19. The analyst then -- when this hanger was re-reviewed during the design reverification program over the past year and a half, it was found that perhaps this needed to be more consistent so the analyst consciously put all of the load points for three of the pipes at the same location. Again, at these three points, it differed from Mr. Yin's interpretation of how it should have been. There were 30 cases because there are ten load cases -- there are ten load cases in the same model, ten load cases,

so you get three pipes and ten load cases, you have 30 disagreements that Mr. Yin had with the analyst. This over the course of time has gotten categorized as 49 errors in one calculation. The first 19 were with the first revision of the calculation. The second 30 were with the second or third revision of the calculation. So what we really had was one difference of opinion that was, caused, 49 differences in the different load combinations but the actual structure of the whole concern was one difference of opinion and that, to categorized that as 49 errors, I believe is a mis-statement.

So, the error issue can best be placed in perspective by saying that out of the 120 some odd supports that we have reviewed, some of which admittedly were the most complicated designs in the plant. We have found that all of the supports can be qualified.

When the as-built hangers are reviewed, it can be shown to be qualified.

MR. TAYLOR: This is Jim Taylor again. You mentioned that that review of 120 -- excuse me Bob, you can be right after.

You said or you alluded to the fact that you had selected the most complex configurations. Is that generally true? That whole population that you repeated the calculations on, that you deliberately went out and selected the

most complex various types of supports with sizing and so forth?

MR. SHIPLEY: Perhaps explaining what we did might help shed some light on that. Through allegations and various discussions that members of the Staff had had with people at the job site and ex-people at the job site, there were chosen 25 extremely complicated hangers. They were purposely picked because of their degree of complication. The project then went and picked additional hangers in the manner that we picked, clearly the most complicated small bore hangers in the plant are designed using computer methods. We took the total scope of computer analyzed small bore piping and did a random sampling of that scope.

MR. TAYLOR: Other than the 25, is that right?

MR. SHIPLEY: Yes, sir.

MR. BOZNAK: My name is Bob Boznak. I have a question on the -- since we're in the area of training on the subject of the pipe support, pipe interface. That's the area that we've seen that most plants, if there are difficulties, it's this particular interface where it occurs and what I'm probing for is the type of training that you've given your people to make sure the interface information flows across this interface properly and that there is a responsible party that can make decisions on

what happens when there is a disagreement between the two groups, the pipe support groups and the pipe design group.

MR. SHIPLEY: Perhaps I could request a little clarification.

MR. NORTON: Larry, I think he's asking about Roman 3-7 -- let me interrupt for a second. We've just passed out this three page green thing and what that does is, it lists -- if you look at the left-hand column under item -- the first two are II-1, II-2; that's criterion that Mr. Yin -- this is in the order in which he presented it on March 28, so that's criterion II, item 1 and item 2 and it gives the name and we just have brief word descriptions of the topic which, of course, aren't -- you shouldn't take them too literally. They're just to identify the topic and then it gives you the panel member who is going to address it and I think Larry, the question that Mr. Boznak just asked is III-7 which is item 7 which is criterion III, item 7 on page 2 of that index about in the middle and it's entitled OPEG Stress/Support Interface and I think that's what he's getting at and you can either address that now if you'd like or when we get to it.

Incidentally, I might point out that we're still in the first two items and we've been here an hour.

MR. VOLLMER: Bob, do you want to defer it until then?

MR. BOZNAK: I can defer it until then. I was looking at your procedures rather than the details that you might expect to find when you get to the other item. We're talking about training and perhaps we'll cover that later.

MR. SHIPLEY: The other item is primarily the procedures and how the work flow is handled as opposed to the technical.

MR. VOLLMER: Were you through with your presentation on the first two items? Criteria 2, then?

MR. NORTON: I think we were except for the question part if you have others.

I believe Mr. Yin was trying to say something.

MR. VOLLMER: I want to get to Mr. Yin in just a second, if I may. Denny?

MR. ALLISON: Do you want me to go ahead? My name is Dennis Allison. Question on criterion II, item 2, procedure changes. We have, I guess, six people who were interviewed and indicated that they'd never been told of procedure changes. You talked about how supervisors generally do this. Have you done any investigations that lead to hard data that find people who had been told about procedure changes or who have shown that they've known about the ones they need to know about?

MR. JACOBSON: This is Mike Jacobson. There have

been several cases where -- we'd mentioned this earlier where projects you need training sessions were held, and these were primarily in response to audit findings or other issues that were raised where it was apparent that people needed to know more about a specific topic.

MR. MANOLI: This is Kamal Manoli. I have a question about the type of the training that people came on-site. Had they been involved in any checking process before they received the training or was it limited to the guys doing the preparation of the calculations?

MR. KAHLER: I believe there's a possibility that because some individuals did not receive training within the allotted time, that there's a possibility they could have performed a checking function without having been trained. I do not know of any specific instances that we have documented where that has happened.

MR. MANOLI: Or they could have been prepared and checked by non-trained personnel?

MR. KAHLER: That is true but there is also a third level of approval on our calculations and that is the supervisor's approval in addition to the preparer and the checker.

MR. MANOLI: Usually that's over-view kind of --

MR. KAHLER: It can be. It can also be detail.

MR. VOLLMER: Mr. Yin has a comment after which I'd

like to take a short recess and discuss with Mike ways to expedite the process.

MR. YIN: This is Isa Yin. Contrary to what Mr. Shipley was just mentioning, I was trying the most conservative method and the PG&E people is applying the most reasonable conservative approach is really a false statement.

My identification of the problem is not trying to make the problem as conservative, as difficult, but rather trying to identify the point, the input of the calculation is wrong. For instance, Mr. Larry Shipley asked me for a cup of water or a cup of coffee and I hand to Mr. Mike Tresler a cup of coffee. It's very close to each other, but in fact for you, you never get the cup of coffee. It's the same thing with the loading approach. If the structure is right here where the load hits and you assume that the load is hitting the other side, then you would say I'm conservative. If that's being conservative, so be it. To me, it's accurate.

And the second point is, the fact you're talking about there's no problem and the evaluation does not identify any big problem. The efficiency and so on -- after my investigation and also the review of the problems you people are going back, pick 85 computer runs and 25 hand calculations for your evaluation and you sent us the

response that the report is telling us 78% are problems, including additional calculation that has to be performed and 17% involving such a problem you have to rerun the whole calculation, so you add them up together -- is 95% rejection of all the calculation that you review that has been proofed, has been checked by your people so with this kind of percentage, how can we say your program is working? How can you say your training is working?

MR. SHIPLEY: I think from several points of view, let me start by talking about the results and not the process. The results indicate that when the work is done, there's sufficient conservatism in all the hanger designs such that an amount of additional work, we are able to show that the hanger details, that the hangers as designed and as-built are acceptable. The proces that, what I believe Mr. Yin is talking about is the process that got us to the as-built configuration as opposed to the acceptability of the as-built configuration. My remarks previously were addressing the acceptability of the as-built configuration for, I believe admittedly by most people the most difficult small-bore hangers in the plant. What is there is acceptable.

MR. YIN: I don't like to argue this point and believe this -- we're not trying to say hey, this 110 that was going to fail meeting the allowables, is just bring up

the point, the QA program, Quality Assurance program is to remove, trying to remove the doubts from these kinds of things. So if the program doesn't work, although you analyze 110, you're lucky to get those 110 are meeting the requirements. Really, I have no confidence in my mind the rest, thousands and thousands of piping and hangers will work, will come out essentially the same thing, because you have so many people involved in this job, I'm not too sure all the people are in the same group, 110 and I don't know whether or not we have more complicated hangers in other areas or whatever because you have no assurance and you have no procedural control in your work, then anything can happen.

MR. SHIPLEY: Again, Isa, without arguing, I guess I don't understand where you say we have no procedural control. I don't know what your basis for that is. There is clear procedural control and in fact, the errors you're talking about are in general of a very minor nature.

MR. TRESLER: I'm Mike Tresler. I think when we went back over these 120 calculations or whatever the exact number is and identified the need to do additional analysis to show certain qualifications, part of what we're talking about is re-performing the analysis to document engineering judgements that were made and so what we're

really saying is by preparing calculations that totally represent the as-built configuration, we've shown that those installations are qualified.

Now, if we were to exercise judgement, I think many of these would have been accepted as they were in the first place without additional analysis so I think to portray these as a rejection rate is somewhat misleading.

MR. VOLLMER: Why don't we take a recess?

MR. NORTON: Before we do that, I hope that your group, what your review group is looking at is the February 7th submittal which Mr. Yin just referred to as saying 78% failed and I think if you read page 13 of that submittal, that's a very poor characterization. That 78% had very minor things and I quote from that submittal, "lack the statement needed to document the conclusion reached. Did not contain documented evidence of the evaluation of certain items which the reviewer, being the second reviewer felt was prudent to include the calculation." The third item was, "contained information of which the reviewer could not make an assessment and thus deem it necessary to perform a supplemental calculation in order to support his evaluation and conclusion." And that's, to characterize that as hangers that are wrong or supports that are wrong, I don't think that's what this write -up says. The number 78% certainly

appears on that page but I don't think that characterization of this February 7 submittal is accurate from the submittal itself and I would hope this, perhaps this submittal could be made a part of this record because I think it should speak for itself rather than people arguing about trying to quantify these matters.

MR. VOLLMER: We'll take a recess. Off the record.

(Whereupon, a fifteen minute recess was taken.)

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10:30 a.m.

MR. VOLLMER: Okay, we will reconvene now.

Before we get onto the next topic, let me make a couple of comments. One is, perhaps to expedite the process and make it a bit more meaningful, it might be better if we allowed the presentation to run its course, since I understand that it is only ten or fifteen minutes. That might keep our question more focused. I am as guilty as anybody of running off into different criteria.

Secondly, I would like to concentrate on the mission that we have here. As I mentioned in my opening remarks, we were to -- this group, that is -- was to try to identify the overall impact that these issues would have on the safety of low power operation. We should also consider, where appropriate, engineering significance of the issue.

So what I would like to do, if you could focus your presentation a bit more on those particular areas, we do have inspection findings which Mr. Yin has raised, and I think as you would indicate yourself, it is clear that these inscpection findings are factual, but let's get to the significance more and debate less, the actual finding itself.

All right. We can proceed.

MR. NORTON: We would like to -- we have covered two other criteria and we would like to skip Criteria XVI-1 until later. I would suggest maybe if we could cross out as

we cover these, so that there are some -- if there are some that we somehow don't cover, we can sum up at the end or whatever. I think that there a number of things that addres XVI-1, and it would be easier to do that toward the end, as opposed to now.

So I would like to go to Mr. DeUriarte.

MR. DE URIARTE: My name is Tom DeUriarte. We are going to discuss Items Two and Three under Criterion XVI, (XVI-2/3), the observation from the transcript, page 23, is the lack of timely correction, of PG & E in the audit findings, and lack of PG & E management attention to assure adequate project responses to the audit findings.

The two items appear to stem from a concern expressed during one of Mr. Yin's recent inspections. At that time, he identified three PG & E quality assurance department audits, Nos. 20703, 20813, 20917, as containing audit findings that were responded to an corrected in an untimely manner.

PG & E management detected these concerns early in the project -- approximately November 1982 -- and issued a non-conformance report, which we call an NCR. The number of that NCR was DCO-82-2A-N005. This NCR identified the failure to provide required responses to several audits, including the audits in question, after the audit findings had been identified and reported.

Non-conformance reports are issued in our system to

identify significant departures from requirements.

PG & E management gives attention to the timely closure audits, findings, and NCR's by establishing priorities and schedules completion dates based on the significance of the problem.

The evaluation considers the impact on work completed, and on work in progress. It considers whether the correction needs to be made as soon as possible, or can be scheduled for later correction, without any impact on the work going on.

Following the evaluation of that non-conformance report, the following actions were accomplished: the audit findings from the involved audits were closed. The generic issues involved regarding the response to our findings, which was identified by management in NCR, were resolved by revisions of quality assurance procedures, which provide for the following things: to assure that written responses, instead of verbal, are obtained by quality assurance departments as required; to assure that responsible organizations include a scheduled completion date for corrective action, if corrective actions can not be completed within thirty days; to assure that corrective actions are accomplished as scheduled and to provide a system for obtaining revised schedule dates with a status for quality assurance to evaluate.

Requiring the quality assurance department to notify GONTRAC. CONTRAC is an acronym for a management committe which stands for the General Office Nuclear Plant Review and Audit Committee. To notify them if the scheduled completion dates are repeatedly rescheduled.

In summary, on this item, we feel that our management has given attention to insure adequate project responses, and timely closure of PG & E audit findings.

Are there any questions on that item?

MR. VOLLMER: Okay, let's see -- the issues, however took place after the -- this management attention had been given, is that right. Am I understanding?

MR. DE URIARTE: I missed the first part of your question.

MR. VOLLMER: The issue that we are dealing with, or the concern that was expressed -- actually, as a result of an audit taken after this management attention that you referred to, is that right?

MR. DE URIARTE: That is right.

MR. VOLLMER: Could you explain a bit about that?

MR. DE URIARTE: When you say an audit, you mean a PG & E audit. Are you referring to an NRC inspection or a PG & E inspection?

MR. VOLLMER: You said that management had given attention, based on their own findings, that the audits had

not been adequately followed up on and they had written ---

MR. DE URIARTE: I understand it now.

All audit findings are evaluated at the time that they are identified, to decide the things that I just covered about -- are they covering work in progress, is there a need to go back and review work that has been completed, do we have to correct it as soon as possible, etc.

In the follow up of those items, if you follow them to closure, Senior QA management -- supervisory people -- review the status of those things on a weekly, sometimes on a daily basis, depending upon the item, and depending upon its estimated completion date. In doing so, on the audit findings involved, it was identified that there was a series of them that had not been responded to in the required time frame.

And therefore, they were collected as a group, and reported on a non-conformance report. What that does is that necessitates a technical review group to sit down and evaluate that particular item. The technical review group consists of members from the various departments who are involved.

And so, essentially what we did is that we escalated the problem from a series of lesser significant problems, to one of major significance.

MR. VOLLMER: Would you have an audit report in that requires follow up, based on the number of findings -- is

there an assignment given to priority or timing for that follow up or action to be taken? Or is this left in the hands of those responsible for taking the action? How does that work?

MR. DE URIARTE: It is a joint evaluation on prioritization. The project -- the Diablo Canyon project for PG & E has always used the a system of priorities for any action that needed to be taken. I think in the middle 80's or the early 80's we started using an actual numbering system for priorities. We would actually assign a priority that was prescribed in documented system, based on scheduled milestones, or steps and activities.

Prior to that, the priority was really a process based on the significance of the item. It was not only tied to a specific detail description system. We have always analyzed a finding to determine what is its significance, when does it need to be closed. Ever since we have been doing audits.

MR. NORTON: Mr. Vollmer, to perhaps speed up, I think the next four topics, which are covered by Mr. Jacobson and Mr. DeUriarte are all very inter-related. They are entitled Delayed Corrective Actions, Audit Followup, Audit Closure and Management Attention to Audits.

Perhaps, if they presented -- I think that they are fairly brief presentations -- perhaps if they did all of

them and the corrections were held, it would speed up the process. I think that particular question related to, I think, the third one down.

MR. VOLLMER: What you are saying is that I am violating my own ground rules. Okay.

MR. NORTON: Mike, why don't you go ahead now, with the XVI-4?

MR. JACOBSON: I am Mike Jacobson, and I will address Criteria XVI-4.

The observation is delay in Bechtel in audit findings correction, without documented justification. This appears in the transcript on page 23.

Let me first respond that there is no regulatory or DCP QA program requirement for documented justification for delays. And then let me address how our program covers responses to audit findings.

The response time is agreed to at a conference for each audit. And this depends upon the significance of the finding when action should be taken. And then, our program follows the guidelines and requirements N45Q12 which requires the auditing organization to follow up as necessary to obtain response.

The standard, I believe, states that the response may be written inquiry, or re-audit or other appropriate means. Project QA performs that follow up, either by a

verbal or a written inquiry, often before the finding is due.

If appropriate, an extension to the response time can be requested, with approval.

If these measures are not sucessful, the next step required by our program, we notify project management in writing of the overdue response.

These two measures have been successful in getting responses in all cases. If there were not, additional measures could be taken, such as preparation of a non-comformance report or a directing a stop work action.

The transcript is not specific, so I will address all of the audits of OPEG. There were seven OPEG audits that required responses. In three of those cases, the responses were either received early or within one week of their scheduled date. The remaining four had other circumstances which I will briefly go through.

On the first one, the response was received seven working days late. But, the response coincided with the Christmas/New Year's holidays. There was no great significance to that.

The second audit had two findings, one of which was answered early. There was an extension request received on the second, it was responded to within that time frame.

The third audit had four findings, three of them show a written response date of ten working days later.

However, in this case, engineering was provided draft responses to the auditors, and he had been engaged in some discussions with them in reviewing them. Once their acceptability was decided, they were formalized and submitted.

The fourth one was received substantially overdue. This finding concerned the need to microfilm historic calculations and did not affect current, on-going work. The apparent reason for the delay was some difficulties that they were having in coordinating, prioritizing inputs in the records management system.

We were aware of what was going on and we were tracking the progress during this time. For all of the timings this audit, management was notified and concurred.

On the last audit, extensions were requested and granted. The reason was the need for additional time for coordination between San Francisco, and the job site.

For two thirds of the findings, responses have been received within the agreed time, and the remainder are coming due in the near future.

To go on a little furthur, project QA has re-emphasized engineer, the need for timely response. We certainly agree with that, and we are putting additional emphasis on aggressive follow up.

And we have also implemented an additional tracing system, primarily to give more visibility to when items are

due and what their status is before the due date arrives.

MR. NORTON: Mike, why don't you just skip to XVI-6, which is also Bechtel, and then maybe Mr. DeUriarte could go back to XVI-5, which is PG & E and XVI-7 which is also PG & E. I think for a little bit, more consistency.

MR. JACOBSON: Okay, XVI-6 -- the observation is inadequate Bechtel QA followup. Audit finding relative to OPEG's design personnel training, were closed, prior to corrective action taking place.

And the reference in the transcript is on page 23.

The audit referred to here is 28.4-1 and 2 which was performed in February of 1983. There are two findings issued. Contrary to observation, the recommended corrective actions were completed by engineering and accepted by QA and the implementation verified by QA prior to closing the findings.

The corrective actions were completed on April 20, 1983, and the audit was closed May 10, 1983.

The first finding identified serveral engineers that had not received training as we discussed earlier. The corrective action on that consisted of engineering reviewing all training records at OPEG, identifying those that required training and performing that training. This was completed on March 14th.

This action was then accepted and its implementation verified by project QA. We verified that the original

engineers found deficient were trained and we also checked the roster of OPEG against training records, verified that the engineering review had been effective.

And that was completed and the finding closed on May 10th.

The second finding followed a similar sequence. We do acknowledge that there are some reocurrences of OPEG training discrepancies later in the project. This is discussed in the February 7th submittal.

But, we believe that this audit did result in the correction of most of those discrepancies, and it is my feeling that the later reocurrence of some training discrepancies doesn't mean that this audit was improperly closed.

We have reviewed all other audit findings against OPEG to insure that they were not closed prior to corrective action being taken, and found no problems.

And finally, the indoctrination and training area was once again audited in accordance with our normal schedule this month, earlier this month, and the results show satisfactory implementation of the training program.

MR. DE URIARTE: Okay, I will go back to Criterion XVI-5, and the observation was the lack of PG & E audit followup to insure effective corrective actions; to include identification of the causes, preventive measures taken and

and evaluation for generic implications. This is from page 23 of the transcript.

All PG & E audit findings are documented on open item reports or non-conformance reports, and corrective actions to those findings are evaluated by PG & E, QA supervisors, as to the identification of causes, preventive measures taken and possible generic implications.

If the audit findings are document on non-conformance reports the review for generic implications is documented on the form -- the actual entry spot for that specific evaluation.

Open item reports do not have that requirement that the review for generic implications is documented on the form. They are considered to be less significant items.

Evey non-conformance report is then evaluated by what we call a technical review group, which has the responsibility in part to evaluate and document the cause and resolution and corrective actions required to prevent recurrence for each deficiency.

Part of determining the corrective reaction to prevent recurrence is the technical review group's investigation into the generic implications of the deficiency.

Although an open item report does not require documentation of the evaluation of the generic implications, the evaluation takes place as if it is a normal routine

review of the open item.

One of the key aspects of reviewing something that is identified by the auditor as a less significant problem is the evaluation of whether or not it is an non-conformance. If it is determined to be a non-conformance, it is then redocumented on a non-conformance form, passed onto the technical review group.

Now, the example that I was giving in the other item is the review of these audit findings that were not responded to in a timely manner. These were considered to represent a non-conformance. We have escalated all of those open item reports into one non-conformance report.

We have revised our procedures to require the audited organization to document in greater detail the steps taken to evaluate generic implications of audit findings. The specific corrective actions taken and the basis for considering a finding closed..

Auditors will then perform followups of those things that have been documented and verify the detailed information. We perform trend analysis on open item reports as well as non-conformance reports.

On Criterion XVI-7, the observations is the lack of PG & E management evaluation of the effects of the many audit findings that have not been corrected for extended periods of time. This is from the transcript page 23.

PG & E QA department has always evaluated all PG & E audit findings and informed management of their status. All audit reports and finds are currently transmitted to the Executive Vice President, Facilities and Electric Resources Development, which is Mr. Maneatis. Standard distribution is made to all involved organizations. All PG & E departments and the General Office Nuclear Plant Review and Audit Committee which we refer to as GONTRAC.

A monthly status report is made to GONTRAC. Similar distributions of audit reports and findings is always been made, since the inception of the quality insurance department.

As stated earlier, hard findings have always been evaluated to determine the impact of the finding on work completed and work in progress. The evaluation has always considered whether a discrepant condition needs to be corrected immediately, or can, without adverse impact, be corrected later. Based on that evaluation, findings are prioritized and the actions scheduled.

Prioritization was not a formal documented process until the 1980 time frame. It has always been a part of the process.

The departments responsible for correcting audit findings were required to provide estimated completion dates for their corrective measurers. An example of PG & E management's attention to the evaluation of audit findings

and the item's important quality, is the decision made by GONTRAC in June of 1983.

At that time GONTRAC directed the QA department to not only inform them of the status of QA audit findings, but to also include the status of all non-conformance reports generated by all PG & E departments in a single report.

In August of 1983, Mr. Maneatis directed the QA department to further include the status of all quality problem reports of any kind -- generated by PG & E departments and major on site contractors into that same single report.

Since August of 1983, about sixty quality problem status reports have been issued to date. Whenever a Diablo Canyon Unit One approaches a change in operating mode, these status reports are sometimes issued on a daily basis -- to management attention.

MR. VOLLMER: Okay, I have two questions. One, I guess would be the generic nature of the findings that we have, whether or not these findings would be considered representative of other work areas, since they were taken out of an isolated area. Secondly, as I understand it, your audit findings are submitted broadly to a lot of levels of management, including that of Mr. Maneatis, and I would like to ask Mr. Maneatis, what attention he is able to give to the audit findings and what he does with them.

MR. MANEATIS: I am George Maneatis. I will start

with the latter question.

I receive these, as was indicated by Mr. DeUriarte, on a regular basis, and depending upon their significance, I call in the manager of quality assurance, and other members who are affected, and discuss the nature of these findings.

A lot of the disucssion has to do with timelieness of closure, because there are -- the date is indicated as to when these findings have been made. We do have disucssions on generic significance -- what does this particular finding imply? Where do we have to strengthen our organization, as an example, to preclude their recurrance? Is it ignorance of procedures, is it lack of training? In some cases, we come down on that lack of training.

In that connection, we had decided to put together a quality assurance training film, which I introduced and had made professionally, to convey more widely to all of the employees at Diablo Canyon, precisely -- committment to compliance with all aspect of 10-CA-550 Appendix B. I just give you some of those examples.

It is a kind of continuing thing that goes on almost daily. We did have an organizational change last year where I had the manager of quality assurance report directly to me, so that I could give that particular manner, top management attention.

That is an awfully long answer, Mr. Vollmer, but if we need anything else, I will be happy to collaborate.

MR. TAYLOR: This is Jim Taylor.

I have a question -- your reference to a technical review group, looking at the audit findings. Is that a PG & E group?

MR. DE URIARTE: Yes, it is.

MR. TAYLOR: And who is in that technical review group?

MR. DE URIARTE: The required members of the technical review group -- the chairman is sponsored by the department responsible for the NCR. It must contain one quality control member if it is a department other than QA, one QA member, and then any other members who can lend information to the subject.

MR. TAYLOR: And you said that they review your audits as well as the Bechtel audits, is that right?

MR. DE URIARTE: They review the subject of an non-conformance, what they are reviewing. There is a technical review group fromed for each individual non-conformance. It is not always the same group.

MR. TAYLOR: I see.

MR. NORTON: Mr. Vollmer, I think maybe your first question got lost in the response to your second question and then Mr. Taylor's question. I think that you forgot what

your first question you asked was, but I think that it was directed at Mr. Di Uriarte's ---

MR. VOLLMER: The question was: didn't these finding were in this particular area that was inspected; what about if you look at other work areas, would you expect to see the same type of thing, or not, and if not, why?

MR. DE URIARTE: I am not sure that I understand your question.

MR. VOLLMER: The findings that we are discussing here on XVI -- help me out ---

MR. NORTON: That were identified ---

MR. VOLLMER: -- that were identified were the results of the inspection of one relatively narrow work area, when you consider the whole broad aspect of the project. The question is: would you, if you looked at another aspect of the project, expect to see the same general findings, and if not, why not.

MR. DE URIARTE: Our internal review that identified the need for issuing a non-conformance, is a routine review. This non-conformance was identified long before the inspection. It was not identified as a result of the inspection. We have made this review of our findings in all areas.

If not -- we have not found it to be ---

MR. NORTON: I think that you have to put that in perspective. These were observations of findings that had

already been made by the QA department. I mean, these werent unique to this inspection, except that it had to do with that subject matter, and I think the answer is obviously those kinds of audit findings by the QA department would be historically, through out the project in all phases. I mean, because they audit all phases, and they have findings in all phases.

So the answer to your question, I think, is yes. That those kinds of findings were supplied throughout and I think that is what he is after.

MR. DE URIARTE: But the lack of inadequate response was not a generic part of it.

MR. VOLLMER: Questions?

Well, I guess that we can move on.

MR. NORTON: Again, I think that we want to combine one, two, three and four under Criterion VI, before questions, because again, they are all closely related and I think many of the questions might be answered on number one by the following discussions.

MR. KAHLER: My name is Ed Kahler.

I will be addressing three items on the Criterion No. 7. Item One is characterized as an observations that designers were using out of date procedures to perform their work, reference transcript pages 28 and 29.

MR. FRIEND: Excuse me, did you mean Criterion Six?

MR. KAHLER: I'm sorry, yes. I did mean Criterion Six.

This particular concern was relative to a set of sub-tier procedures to the engineering manual that were used exclusively by piping and pipe support groups..

At the identification of the problem, the on site engineering organization initiated a discrepancy report required by our quality assurance program, and studied the problem and came to a resolution of the problem.

In their investigations, they identified that in OPEG group, there were sixty three manuals containing one hundred and thirty three criteria documents, four hundred and twelve procedures, and four hundred and fifty one instructions were review -- to give you an idea of the scope that was done for this particular issue.

The results of that review showed that ninety percent of the documents were -- that were under control, were propertly and correctly in place. In no cases, did they find any out of date criteria.

In reviewing and trying to determine how this had happened, at a point in time prior to this we had a split of these piping procedures, to thread a better control -- that is, there were a number of procedures that were only for pipe hanging, piping, or pipe support work. Other procedures that were specific only to the piping analysis group.

We thought that it would be better control in this area, if we split the two manuals and when we split the two manauals, the engineers occasionally decided that they would keep the old procedures, even though they were identified as no longer applicable to the work.

We found instances where engineers would receive a procedure, sign off that he had received it and since it was not basically applicable to his work, he would put it in his hold basket rather than immediately filing it in his procedures manual. That is the type of discrepancy that was noted in the manuals.

We reviewed all of the documents -- we reviewed the impact of the document, or of the lack of control of the document -- of the procedures manuals. And, we assesed it, that based on the areas of the findings that we had, that there was no impact on the work of the individual engineers.

We also -- to tighten control of this particular problem, we have revised the piping procedure control procedures to require that supervisors review the manuals held by their employees on a regular basis to assure that they are current and up to date.

Item Two, under Criterion Six is characterized as Inter Office Memorandums used in lieu of word procedures, the reference is from transcript page 29.

We addressed this particular concern in our February

seventh submittal to the NRC, and then in summary, the project has formal procedures for requesting and approving design changes. The procedures do not permit that design changes be made on the basis of an inter-office memorandum.

The first inter-office memorandum involved the use of welding codes for calculation of skewered welds. The supervisor of the pipe support group issued this particular memorandum for clarification to his people to make sure that there were no improper interpretations of the code in that area. This is the AWS Code.

The inter office memorandum did not change any design documents, and therefore we feel that it did not violate any engineering precepts or the approval process of the design change requirements.

The second inter-office memorandum was a memorandum from the engineering organization to the construction organization, in response to a question about the pre-heat weld temperatures for welding. The question had been raised about the applicability of the pre-heats that were in a Pullman Power Products procedure. Engineering reviewed the pre-heat temperatures in that procedure and concluded that they were excessively high, and requested that construction request Pullman to revise their procedure.

Again, we did not change any design documents and our conclusion is that neither were used inappropriately.

Item Three, under Criterion Six, is characterized as procedure listings were out of date.

We responded to this particular observation, again in our February 7th letter to the NRC. During an inspection it had been noted that the table of contents of the on site project engineer's piping procedures was a later version than that which was in the procedures manuals used by the engineering and design work group.

Ironically, I guess, that this observation was made by the inspector at a time, when management was trying to tighten up the control of issuing these procedures. They were instituting within their administration organization a more tightly controlled system of distribution to the engineering people. And the project engineer had requested that that particular revision to the piping procedures not be distributed until that process was in place.

We went back and review the impact of not distributing this particular procedure for the impact on the engineering work. In review the procedures it is noted that they were primarily of an administrative changes or minor clarifications. Failure to apply them to design work for a two week period had no adverse impact on any of the design work.

Again, as I stated earlier, supervisors have been directed to review the manuals that are held by their subordinates on a regular basis and also that the manual

configuration control process is covered as a QA auditable item.

End of discussion.

MR. OMAN: My name is Bob Oman.

I will address the fourth point under Criterion Six, which has to do with the design being conducted without adequate control documents for an extended period of time, with reference to page 28 and 29 of the transcript.

As Mr. Kahler indicated, the implementing procedures that were used in the design -- small bore pipe supports -- at the job site, were authored by the project team piping group, and the control and distribution of those procedures was managed by the project administration group, using a system of signed returned receipts.

They used a master distribution matrix, which was prepared to establish which manuals and manual holders would receive specific documents as determined by the requirements of their particular job assignments.

Which is to say that the pipe support design engineers would receive one set -- a predetermined set of procedures; pipe stress engineers would receive a different predetermined set of procedures.

Not every engineer got his own individual copy of control procedures, assigned to him. That was not a requirement and we believe that assigning each and every engineer his own

copy, would lead to complications in the control of the documents and in the distribution of changes.

And we, therefore, believed that an adequate number of control copies, within the work area, would -- and available for reference in the work area, would be sufficient.

When the on site project engineering group began the small bore pipe support effort in the letter part of 1982, the pipe support group consisted, in the November 1982 time frame, of eleven engineers. At that time, there were three controlled copies of procedures assigned to that group in their work area.

At that time, the group was increasing in size as the effort was building up and it was recognized that with the addition of more people to the group, we would be in need of additional controlled copies, and we requested them in December.

We received additional copies of the manuals in December, but we recognized very quickly that we were in receipt of uncontrolled copies. Consequently, in January, we asked for specifically- -- we specifically asked for controlled copies. And, in February, thirteen controlled, a total of thirteen controlled copies were assigned to the pipe support group, at which time, the group numbered about thirty five engineers.

In -- historically, in April of 1982, there was a

complete reissue of all controlled copies. Additional copies were assigned as the group grew, and as Mr. Kahler indicated, currently there are on the order of sixty three controlled manuals assigned to OPEG engineers.

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(End of page.)

MR. OMAN: (Continuing) In summary then, although not every engineer had his own signed controlled copy, that was not our intent and we believe that it was not necessary. There were sufficient copies available for reference in the work area at all times and the engineers were able and were directed to use them.

MR. NORTON: I think that concludes criterion 6, the four items.

MR. VOLLMER: I had a couple of question. One is, when was the system instituted, the return receipt system for keeping track of receipt of updates?

MR. OMAN: I will take a crack at that. We, well, OPEG always had a return receipt requirement when they received an instruction manual. At the very beginning that return receipt was returned to the piping discipline in San Francisco and more recently that function of control was taken on by the project administration group in the Spring of 1983 but there was always a return receipt system with distribution of instructions.

MR. VOLLMER: What does this system provide for in terms of, let's say the return receipt is not received after two weeks, say, what period of time is some action instituted to see why the receipt has not come back?

MR. KAHLER: I believe that is a two week requirement. If it has not been received within two weeks, there

is a follow up letter to the individual to the man who was assigned to it asking him for an explanation why he has not returned it.

MR. VOLLMER: What's your general view on keeping old, out of date procedures. You said that you often allow the individuals to keep the old procedures for whatever reason. Do you feel that this is an adequate practice or what?

MR. KAHLER: This is Ed Kahler. The requirement is that if an engineer wishes to keep an outdated procedure in his manual, he is required to mark it as a superceded procedure, clearly mark it as superceded.

MR. VOLLMER: I only have one other question.

How often are the supervisors supposed to review their employees manuals for current status? You said, I think, they did it on a regular basis. I'm not sure what that means.

(Pause)

MR. OMAN: I believe the procedure either specifically states which I believe it does that it's a monthly requirement, that the supervisor review the manuals of the engineers under his supervision on a monthly basis.

MR. TRESLER: This is Mike Tresler. I just spoke with Myron Lefke and he informed me that the procedure

had been to perform this review on a monthly basis. Recently it was changed to a periodic basis, non-specific and I believe the intent of that is that it is to be performed at whatever frequency is necessary which ensures that adequate control exists. However, it may be more frequent than monthly.

MR. VOLLMER: Is there any particular record of when a supervisor does this and finds the things to be adequate? Is this noted in any way or is it just something that is done as part of his routine but not documented?

MR. OMAN: I believe it's done as a routine item and I don't believe there's a specific requirement to document his review of the manuals. The review.

MR. TRESLER: I'm sorry, it is documented.

MR. VOLLMER: How is it documented?

MR. TRESLER: It's documented as a report by QA, those QA individuals assigned to monitor OPEG.

MR. VOLLMER: It's an audit function of theirs?

MR. TRESLER: Yes.

MR. VOLLMER: If they audit the activities not documented, how do they know he did it? He says, I did it?

MR. TRESLER: No, I say it is documented, it is documented in an audited report.

(Pause)

MR. TRESLER: I'm sorry. As a clarification, this

is Mike Tresler again. Apparently, the audits performed by the supervisors are not documented but there are audits performed by the QA organization within OPEG to verify that the audits being performed by the supervisor are effective. These audits performed by QA are done on a two to three week incremental basis and the results are documented in their audit reports. Does that clear it up?

MR. VOLLMER: So, how do they audit an activity that's not documented?

MR. TRESLER: They audit the manuals to verify that the supervisors' reviews are effective. In other-words if they found in their audit a manual was not up to date, the conclusion would be that the supervisor was not doing an adequate job.

MR. VOLLMER: I see.

MR. NORTON: I think you might want to verify time frame here. I don't know that what you just described has always been the case at OPEG and if it has, say so, because if it hasn't I think you ought to clarify it a little bit because --

MR. TRESLER: What I described is the current practice.

MR. NORTON: Right.

MR. TRESLER: In the past, audits were performed and not on a fixed frequency. As a matter of fact, we

performed an audit once where we found a higher percentage of problems than we would have expected and as a result, we stopped work that day and brought all manuals up to date.

MR. VOLLMER: When was that?

MR. TRESLER: Early 1983.

MR. FAULKENBERRY: Yes, Bob Faulkenberry. When were the procedures first sent to the site and is that documented through your control system?

MR. TRESLER: The routing of procedures to the site, all procedures is documented. The procedures were sent as they were developed and the procedures were in place prior to starting work.

(Pause)

MR. TRESLER: I guess it would be late '82.

MR. FAULKENBERRY: Late '82 and that was before the work started at the site and with your system documented could we go in and see, for example that the additional procedures were revised and the revisions sent on a prompt basis?

MR. TRESLER: Yes, that's correct.

MR. FAULKENBERRY: In all cases?

MR. TRESLER: Yes.

MR. SOFFELL: This is Bernie Soffell. Whose responsibility was it to appraise new employees as they came

on board of the existence of the control set of procedures and the need to use them?

MR. OMAN: Well, the training in the engineering manual procedures that we discussed earlier in which the employees received earlier in their assignment and now before they do any work, appraises them of the procedure, the engineering procedure manual as well as implementing procedures that exist.

It is also I believe, important to note that an engineer when he came to OPEG, when he continues to come to OPEG as a new assignee to that group is not assigned group that immediately, that documents an end product. He is familiarized with and I think as was discussed earlier, familiarized with the operating arrangments and procedures that are used at OPEG and he is, as an on the job familiarization training process, brought up to speed with the way that business is conducted and is familiarized with the procedure.

MR. NORTON: I'd like to ask a clarifying question to make sure that nobody's mislead. The stop work that was referred to, did that occur at OPEG or did that occur in home office, is that small bore, large bore or what? I don't think that was clear on the record and the subject is OPEG small bore.

MR. OMAN: I'm sorry, it was large bore I was

speaking to.

MR. VOLLMER: Thank you.

MR. TAYLOR: This is Jim Taylor. You mentioned your own work at the procedures, that you found 90% of the documents up to date and roughly 10% that were not. And then we got quite a description of your process for controlling your procedures manual. Were you finding people using copies outside of the manual? Is that what you saw in that 10%? What were you seeing? You said that you found --

MR. KAHLER: The 10% that we're missing were characterized basically as the problem of engineers keeping procedures that were not known or applicable to their work when the manual was split in the analysis support areas.

MR. TAYLOR: Do you count on the engineers themselves to keep the manuals up or do you have somebody go out and make sure they're up --

MR. KAHLER: It's the engineer's, the assigned engineer's responsibility.

MR. TAYLOR: I see. You're depending on each individual engineer to keep his procedures up to date?

MR. KAHLER: Yes, sir.

MR. TAYLOR: Did you find any other examples? There mentions -- I believe Mr. Yin mentions that people had

procedures that were even applicable to other sites, other work or architect engineers. Did you find any further examples of that?

MR. KAHLER: I believe that is addressed --

MR. TAYLOR: Is that in a later one?

MR. KAHLER: In a later one.

MR. TAYLOR: If it's in a later one then skip it. It may be. I may be jumping.

MR. KAHLER: It's addressed in criterion 5, item 6, 5(a), item 6.

MR. HEISHMAN: This is Bob Heishman. I have one question for you. You mentioned earlier, Mr. Kahler, about, that you found no out of date criteria. I'm not sure you understand what you meant by that product. Can you help me with the clarification of what you were trying to convey to us?

MR. KAHLER: Yes, sir. The particular set of piping procedures manuals is a set of procedures that they are required to follow, a set of instructions or guidance and a set of the criteria to be used in piping design. It's that -- when I refer to criteria, I am talking about the criteria to be used in the design of the supports and the piping.

MR. HEISHMAN: Okay, so the audit results would indicate then that the assumptions to be used and

those kinds of things that are normally in some of those engineering procedures were indeed correct and your findings were that they were using the proper criteria?

MR. KAHLER: Yes, sir.

MR. KNIGHT: Jim Knight. In an earlier discussion, you mentioned that you now have 63 controlled copies of procedures in OPEG. Do you have any feel for distribution? I mean, are they equally distributed or is it likely there's one group where there's only one copy of a control procedure available or several people --

MR. OMAN: I understand the question. I believe, I would characterize it as a reasonably even distribution people. An on-site project engineering group is organized and located physically within trailers at the job-site, double wide trailers which house 30 to 35 engineers in a trailer so not all people are in one trailer, obviously. There's one or two trailers with pipe support engineers and one trailer with piping stress people and I believe that there's a reasonably even distribution of available control documents over the population and the locations where they're located.

MR. KNIGHT: Was there some criterion by which they're issued, if not all, I mean starting with supervision and down the line?

MR. OMAN: Supervision is assigned a control

manual. The on site project engineer, his assistant, the supervisor, the group leadership do have control documents. Down within the groups, withing the squads of engineers within their groups, not every engineer has one. There is the request for additional control copies as made by the supervision within the group and the intent is to give enough copies so that they are readily available for reference in the work area but as I mentioned, without having one for everybody that we feel would encumber the distribution.

MR. KNIGHT: You also mentioned that on April 1983, there was a complete reissue. Were these substantive changes?

MR. OMAN: That reissue occurred because the project organization that was controlling the distribution transferred at that time from piping and mechanical discipline to the project administration. That was the reason for the reissue not that there was any substantial changes at that time.

MR. KNIGHT: But in fact, all of the old documents were out and presumably --

MR. OMAN: Had to be retrieved.

MR. KNIGHT: Retrieved --

MR. OMAN: And reissued by the administration, that's correct.

MR. NORTON: One of the things I think should be said about a lot of these questions and answers and this whole subject matter that these gentlemen don't respond to in responding to individual items is that a lot of these questions are "damned if you do, damned if you don't" situations. For example, the number of manuals. If you send too many manuals down, you're criticized, how can you possibly control that many manuals and if you don't send enought down, you're criticized for not having enough so it's obviously an individual judgement as to where that perfect number lies.

Similarly, you asked who was responsible for changing procedures or putting the new procedures in the manual and one could certainly argue that gee, if you had someone who, that was his function, go around and change, make sure all the manuals had the right procedures, that the manuals would probably be more up to date than if you left it up to the individual engineer.

If on the other hand, the individual engineer isn't responsible for it, how do you know that he saw the new procedure when it was put in this manual, so a lot of these questions and subject matters are very difficult to draw a judgement value on as to, "what's best" and it's really an individual situation and it's very difficult, I think for us to respond to argue that one is

better than another. I think that's kind of missing from this discussion.

MR. VOLLMER: Okay, I think we appreciate that, Bruce.

Let me ask one other, maybe final question on this particular topic and I guess it deals a bit with the, again the generic significance.

As I understand it, procedures used here are basically the same, that are used in the other part of the process and so any findings, good, bad, or without characterizing them would probably be typical. In otherwords, your issuance procedures and getting receipt back, that's the same process, the supervisory review of up to date manuals is the same process -- am I characterizing that right? This is typical of the way the process is handled throughout this particular Diablo Canyon design effort?

MR. OMAN: That is correct. It's the same system for control.

MR. VOLLMER: Any further questions?

MR. NORTON: I think you might want to add though, that OPEG is unique in terms of designs and maybe these gentlemen could explain to you the uniqueness of it, the obvious one being that it's the only design group on the site but there are others, I think. Maybe Mr. Tresler

or Mr. Shipley could --

MR. TRESLER: This is Mike Tresler. One other item that pertains to this subject that causes piping to be somewhat unique when compared to the other disciplines is that there are a much greater number of procedures and instructions prepared to control these design activities than there are for other disciplines because of the greater need for coordination and standardization of the effort so you'll find a much higher number of procedures of this discipline than you would others which makes it more complex.

MR. ALLISON: Dick, I have one question. My name is Dennis Allison. In this group of answers, I don't remember hearing your opinion about whether any procedure problems, out of date procedures or what have you had any effect on the design product. Had you been able to form an opinion on that?

MR. KAHLER: Yes, sir. I thought I expressed that in the two cases, item 1 and item 3. In our reviews, we concluded that there was no effect on the design process.

MR. ALLISON: Not only on the product but on the process.

MR. KAHLER: Yes, sir.

MR. VOLLMER: Okay, we'll move forward.

MR. TRESLER: I'm Mike Tresler and I'll be

addressing Criterion 5(a), observation 1.

The observation is identified in the transcript, pages 31 to 34 and 36 through 39 and is summarized as being prior to August 10, 1982, procedures and instructions for control of DPs which are field identified construction problems were inadequate. I think the basis for this observation is probably driven from a lack of effective communication which lead from a misunderstanding of the purpose of the DP system.

The DP System is not a design control mechanism. It is not a vehicle to provide design to the field and it's not a QA programmatic procedure. It is simply a system that was established to allow construction to ask questions of engineering. The questions that are typically asked are, can you approve the schedule for release for a certain design, I'm unable to install this support because of an interference, that type of thing. We need additional material, request engineering to order more material. The actual design analysis process is controlled by the engineering manual procedures and the procedures and instructions developed specifically for piping. The DP System was used primarily to assure that problems were identified, tracked and resolved on this schedule basis. There is no way that these problems could not be resolved because there are systems in place which

assure that the designs are built prior to entering into any specific mode of operation. The observation identifies the date of August 10, 1982 and through our brief review, we're able to find procedures which guide the DP system all the way back to 1977.

MR. FRIEND: Mike, excuse me.

MR. TRESLER: Yes.

MR. FRIEND: Would you clarify the acronym DP?

MR. TRESLER: I thought I did. It's Diablo Problem is what DP stands for. But once again, it is simply a vehicle for the construction organization to make a request for engineering and generally those requests were of a schedule nature but they were also requesting design clarifications, a new design, that sort of thing.

But the design process was controlled by the engineering manual and the specific procedures in the piping and engineering discipline.

MR. VOLLMER: Could you give me an example of -- oh, excuse me.

MR. NORTON: I think these under 5(a) have to be taken individually. I think they're fairly distinctly different.

MR. VOLLMER: Could I have an example of a typical DP procedure?

MR. TRESLER: Probably for piping the most difficult one would be hanger number 5(a)-10R can't be installed as designed because there's a conduit in the way. Please resolve this problem.

MR. VOLLMER: So where does it go and how does it come back?

MR. TRESLER: From there it is logged out by the construction organization. When the DP is filled out, it is prepared and identified to a specific discipline. In this case, it would be piping and it's identified to a specific individual which would be the piping discipline leader and it is then logged out from the construction organization to the general office. It's logged it. Copies are distributed on a fixed distribution. It goes to the piping discipline in this case. The piping discipline would review it and their response to that DP might be that we consider other work to be of a higher priority and we'll resolve this problem two months from now or it may be we will prepare a new design that will appear on DCN, Design Change Notice 485.

So all it is is a vehicle to communicate a problem and for the engineering department to respond back with a commitment to resolve the problem. In this case, the resolution of the problem would be in the form of

a new design for that hanger that is issued in accordance with our procedures for doing analysis, issuing and distributing a design.

MR. VOLLMER: How long might it take for that word to get back from the field, on what they're going to do with it?

MR. TRESLER: Each one of the DPs is identified, has identified a requested response statement. It would depend on the nature of the problem. Generally, I guess, something on the order of two weeks and I think generally the problems are responded to within that period.

If the problem isn't resolved in that period, the response might be as I said earlier, a resolution will not be provided in two weeks but instead in a month due to other priority work duties.

MR. VOLLMER: Is there a system for assuring that these are closed out so that, like a non-conformance report so work can't proceed with these hanging loose somewhere?

MR. TRESLER: Well you see, what caused that DP to be prepared is that work could not proceed. Work is stopped. They have a design. They can't implement that design, they can't complete construction responsibility. In the specific case of the hanger, yes, there is a tracking system for hangers to identify not only what

their design status is but also their construction status and until all of the hangers are identified to be complete through an analysis of design, construction, and as-built and as-building acceptance system, until that's done, the system, the support is not considered to be complete and if it is one that's identified, for example, fuel loading, you wouldn't receive any fuel loading until it's resolved.

There are other controls outside the DP system but also, yes, DPs are logged, the status of DPs for required completion date is identified, the scheduled completion date is identified and there is a weekly review of those items. I believe they're listed generally on what we term a critical item's report. The word critical is driven off more of a schedule concern than it is a critical design, a critical project scheduling --

MR. FRIEND: But Mike, on the other hand, we don't consider the DP or the tracking thereof as a quality related document --

MR. TRESLER: That's correct.

MR. FRIEND: Or --

MR. TRESLER: It's more of a scheduling --

MR. FRIEND: It's more of a management tool to keep track of things in the schedule.

MR. TAYLOR: Jim Taylor. I thought that I, at least I had the impression that there was an answer to a DP that I gave a construction tolerance. That would be an inappropriate use of DP?

MR. TRESLER: That's correct and the item that you're referring to is a letter. It is not a DP. It is a letter and in the upper right hand corner, that letter is referenced the DP number that asked that question and that letter was written in 1977 --

MR. TAYLOR: Was that --

MR. TRESLER: -- mechanical engineer in charge of piping construction at that time. I drafted a letter requesting tolerance to be established on the gaps that were shown to be required between the pipe and the pipe support. That letter was attached to a DP and set up requesting response from the responsble engineer for piping design at that time. They reviewed it. They then returned to us that letter as authorization to apply a 1/16th tolerance on a 1/8th inch gap so the response was not the DP, the response was the signed letter from the engineer. If you follow me.

MR. TAYLOR: Did that get incorporated then in an appropriate engineering document?

MR. TRESLER: That letter was then transmitted to the contractor in charge of piping installations and they

incorporated those tolerances allowed by engineering in the installation specification for pipe supports.

MR. FRIEND: That's an important feature of Diablo Canyon work. Quite often, the contractors develop and utilize these specifications that govern their work and get approval from the appropriate PG&E officials so it is frequent that the change of specification if you will, is not of necessity carried on a design document but rather billed to the contractor who modified the specification and then gets the approval of PG&E. That's just the system that has evolved.

MR. FAULKENBERRY: So in this particular case, this would not have reverted back into a design change notice and have been documented that way.

MR. TRESLER: It's not a change in design. One of the problems when we were down there is the design comes out and says the pipe is to be located within this box structure and you're to have an eighth of an inch here, an eighth here and an eighth on the top of the boxes, for example, and we found it very difficult to maintain an eighth of an inch at all times and the QC organization was rejecting it, if you had a 32nd of an inch over an eighth so as a result it was recognized that we had to have some tolerance on that dimension and the request was made of engineering in the form of a DP

and a response came back in the form of a letter, allowing a tolerance on that specific dimension of all pipe supports and it was then transmitted to the contractor in charge of those installations and incorporated into their QC,QA specifications for acceptance of the supports. A DCN is not appropriate. If we wanted to do it on a DCN, what we'd have to do is identify tolerances for those specific dimensions every time we issue a support. This was handled on a generic basis.

MR. KAHLER: Excuse me for a minute. Ed Kahler speaking. I think one thing that's important here that we might state, I don't think we can categorically state that no DP was ever used to transmit design information, although the procedures specifically state that it is not to be a vehicle for transmitting design information.

I think another item that I think Mr. Vollmer brought up that might be clarified a little bit, that the construction organization is the originator of this document and when engineering returns a response that is basically a request, you know, tellingthem that it's going to be another two months, they do not close that DP at that time. It will remain open until construction considers they have gotten all of the information from engineering that was requested on that DP.

MR. TAYLOR: This is Jim Taylor. Did the QA

organization ever review whole groups of DPs to see whether the design information was going through this sort of less formal change channel?

MR. DeURIARTE: This is Tom DeUriarte. Yes, we did do an audit of DPs and at the conclusion of that audit, both the general office and the field started indexing DPs and keeping track of the timeliness of responses to them, that a few were bound to contain design information.

MR. TAYLOR: Did you go back then and make sure they were appropriately cleared with the approving design organizations? I assumed you closed it out?

MR. DeURIARTE: Yes, we did. Essentially, what happened was --

MR. TAYLOR: And the approvals that were necessary for the original design were in fact given in this --

MR. DeURIARTE: Yes, that's correct.

MR. NORTON: When was that, time-wise, do you recall?

MR. DeURIARTE: Oh, middle 70's, a long time ago.

MR. MANOLI: This is Kamal Manoli. Did any of these DPs have dispositions on generic bases that effect other type packages or more generic implication that you really need to document it so that you can handle it in

all applicable cases, not just on a single case.

MR. DeURIARTE: I don't know the specifics to that.

MR. TRESLER: No. Each DP was specific to a discipline and was not a plant generic issue or concern and getting back to this question of the frequency of people deviating from the requirement that no design information be processed on DP, I certainly recall being, when I was a mechanical residential engineer down on the site, if I received one, I rejected it and required that design be generated. It was not very frequent that that kind of thing happened.

MR. VOLLMER: Any further questions on this? Gaps, on to gaps.

MR. SHIPLEY: I'd like to treat 5(a)(2) and 5(a)(4) together for purposes of this discussions so if I could briefly go through both, I think they're both related to an observation concerning the lack of or inadequate procedures to govern a specific engineering function.

In the first case, gaps are, the issue is that there was not a specific procedure to determine limiting conditions which are when thermal gaps can be used in the piping structure analysis. Procedure P-11, the piping procedure P-11 requires that if an analyst uses

a gap consideration to allow for thermal expansion in a computer analysis, you must verify the as-built condition of that support or that piping system and document that verification before he can include it in stress analysis.

The intent here is to assure that the analyst himself is aware of that and any other constraints that might determine that a gap could not be used in that particular instance. Or, because the engineer is specifically looking at each case, we don't believe that a procedure that discusses the limiting conditions because it will differ in every case. That procedure is not required.

In terms of the joint release discussion in the joing release observation of 5(a)(4), the observation is that there's a lack of design procedures to describe the use of joint releases for computer model.

Again, we believe that the same thing is true here. A specific procedure is not required. Engineers must make decisions as to how to model individual components. An analogy of this joint release issue is in determining the -- and condition for developing a "KL over R" criteria, buckling, the engineer must determine what that end condition is and apply the appropriate factor in order to arrive at the proper result. It's a well-known engineering technique and it is not

considered necessary to instruct the engineer precisely in each and every case which one he should use. His engineering training has already done that. The same is true of joint releases. Both of these, the technical merits of the joint release and the thermal gap was discussed in detail in the February 7th submittal. The thrust of these two observations are more to the point for a lack of procedure rather than the technical adequacy of what was done and in both cases we believe that it was technically adequate and secondly, we believe that a specific procedure is not required because it's common engineering practice. This is what engineers are trained to do, to make these types of decisions and judgements.

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MR. VOLLMER: Questions?

MR. TAYLOR: This is Jim Taylor. I had a question. You mentioned that the analyst or the engineers must determine in the gaps -- must determine or must verify the as-built to be sure that it's got what he specified. Now does he do this under cold or hot conditions? Or how does he differentiate? How does this process -- you emphasized the engineer verifying the as-built when the work is done. How does he get that distinction?

MR. SHIPLEY: Perhaps I should answer that by explaining that this is more of an after the fact than before the fact.

MR. TAYLOR: Okay.

MR. SHIPLEY: We're verifying an as-built configuration meets all the licensing and Code criteria. So the gap is already there. So what we do is go out and review the gap and review the configuration of piping, and look at the location of adjacent supports and equipment and so forth.

MR. TAYLOR: Is this against predicted thermal expansion?

MR. SHIPLEY: Yes, it is.

MR. SULLIVAN: My name is Ted Sullivan. When you review the gaps with this kind of analysis which I'm not real familiar with, does it matter which side of the pipe, say, the north side versus the south side of the pipe, the gap is

on?

MR. SHIPLEY: Yes, it does. In fact, that is precisely what is done. In most cases, when gaps were used, it was a very tightly constrained piping system where restraints were placed at either end of a straight run, and it was a -- in many cases, it was a low temperature line such that the expansion was small, but that consideration of an infinite stiffness there causes a very large load. And we know that's not the case. And so we took credit for the actual installed condition, and in direct answer to your question, yes. The gap in that case would have been looked at on the north and the south side of the line on the complementary restraints.

MR. SULLIVAN: Is it true that sometimes after a pipe has gone through a number of thermal cycles that it will shakedown and the location of the gap may shift?

MR. SHIPLEY: That is a potential. We believe, however, that the cases where these were used were in the main in locations where again, very tightly constrained systems such that the -- when shakedown occurs in general, it occurs in the more flexible portions of the system. And the growth along an axial run of pipe, we would certainly not anticipate it to change with passage of time. It will be the same, and that is primarily how that was used.

I might say something about when the frequency of gaps being used. Gaps were used on less than one percent of

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the total supports in small bore. And they were used on three supports in large bore.

MR. SULLIVAN: Gaps or this particular type of analysis?

MR. SHIPLEY: Gaps.

MR. SOFFELL: Bernie Soffell. Was that in general low temperature piping?

MR. SHIPLEY: In general. There were some cases where -- I have the numbers if you're interested, but there were some cases where somewhat higher temperature piping, we did use it there also. But these were primarily the first restraint branch off the reactor coolant loop, or reactor coolant pump, to be specific. And where we are -- we are extremely sure of repeatability of the anchor moving, and the gap that is there -- clearly the structural gap itself is not going to change, and since the terminal end of the branch piping is going to have high repeatability because of its attachment to the primary loop, we're confident that that gap will remain as specified.

MR. NORTON: Larry, could you identify the three instances, large bore, -- if you say there are only three, simply identify where.

MR. SHIPLEY: The hangar number?

MR. NORTON: Well, the ascertation of where it is.

MR. SHIPLEY: Oh, yes. Yes. In two cases, they

were adjacent to the component cooling water pump, a pump that the temperature in the component cooling water system, approximately 150 degrees. And in the other case, I need a little help here.

MR. SOFFELL: This is large bore we're talking about now?

MR. NORTON: Yes, three instances.

MR. SHIPLEY: And the third was on a containment spray suction line which is also below 200 degrees.

MR. SULLIVAN: This is Ted Sullivan. What size gaps are we talking about?

MR. SHIPLEY: We're talking about 1/8 of an inch, 3/16 of an inch.

MR. SULLIVAN: What's the normal clearance between a pipe and a thermal restraint?

MR. SHIPLEY: The maximum clearance on any one side is 3/16 of an inch. And --

MR. SULLIVAN: Now, I'm confused between that and your statement that there were only three cases where gaps were used. I thought normally you usually have about 1/8 of an inch gap on all thermal restraints.

MR. NORTON: Explain that's where we took advantage. Go ahead.

MR. SHIPLEY: Yes, where we took advantage of the gap from a thermal expansion point of view, the free space

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a pipe has to expand in a specific application as opposed to the general and more conservative case for thermal analysis where you assume that all of it -- that there are no gaps in restraints.

MR. SULLIVAN: So that's where the three comes from?

MR. SHIPLEY: That's correct. In three cases where we specifically took advantage of a thermal gap being there in the as-built condition.

MR. NORTON: Took advantage in the sense of the analysis.

MR. SHIPLEY: The analysis.

MR. NORTON: I think that's the missing phrase.

MR. KNIGHT: And this is Jim Knight. Just to nail it down. In all other instances in large bore pipe, you assumed that if the pipe was restrained by a rigid restraint, that there was no thermal motion allowed. In other words, it was rigid at that point.

MR. SHIPLEY: Yes, assumed no gaps.

MR. KNIGHT: Assumed no gaps. Therefore, you were bearing -- analytically you considered that the restraint and the pipe were integral, if you will.

MR. SHIPLEY: Yes, that's correct.

MR. KNIGHT: For all of the large bore piping?

MR. SHIPLEY: That's right.

MR. TRESLER: This is Mike Tresler. I'd like to add

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one thing if I could. In the case of the component cooling water system, that system's been in operation for five years, and also the entire plant was subjected to two hot functionals prior to considering using the gaps that exist in thermal analysis.

MR. BOSNAK: This is Bob Bosnak. I want to make sure I understand one point. You do not use the gap procedure or you don't use the joint release procedure except in each and every case it must be identified. In other words, there are no procedures because you require that these things be identified every time they're used, is that what you're saying?

MR. SHIPLEY: That's correct.

MR. BOSNAK: And a time in which these are used, then what are your procedures for being sure they're used properly, or how do you take care of that?

MR. SHIPLEY: The normal -- documentation, checking and approving cycle. It's the checker that assures it's being used properly.

MR. KNIGHT: Jim Knight again. Just to give me a better feel, you mentioned three instances of large bore pipe where thermal gaps were considered in analysis. And you said approximately 1% of the small bore. Can you put that into a more quantitative term? What's 1% mean in terms of --

MR. SHIPLEY: 1% means that for -- in piping systems that have temperatures higher than 200 degrees, something

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that has a piping -- something that has a temperature that you can measure, there are 16 supports. That is in February 7th submittal on page five.

MR. SOFFELL: Bernie Soffell. You'd indicated that the temperature of the component cooling system, the one with two instances of large bore, was 150 degrees. Containment spray suction like temperature or same ballpark anyway?

MR. SHIPLEY: 200 degrees during the accident condition and ambient for all but the locus condition.

MR. SOFFELL: Okay. And to follow up on Bob's question, I understand what you're saying when you say that the joint releases or the gaps are perceptions, if you will, to normal practice. I also understood what you said when you said that the checker is the QA. The engineer, is that called to his attention? I mean, I can envision a checker having a number of systems and analyses to review, and I guess the -- I'm wondering where cases of gaps and/or joint releases, that is, the exceptions, are flagged so that the checker is kind of, so to speak, being asked, do you agree with what I've done here.

MR. SHIPLEY: Thermal gaps, there's a formal documentation in the calculation package that the checker would review. Okay. So there's a piece of paper that says, hey, I did this. In the computer model you would see a gap in the actual input to the analysis, in the output and so forth.

For the joint releases, again, I -- this is a form of more accurately modeling a joint geometry as opposed to something that is out of the ordinary and new. It's used all the time in structural design.

MR. SOFFELL: Okay, help me out. Joint releases, are you talking pin versus rigid type of a -- are you talking moment restraint versus --

MR. SHIPLEY: Yes.

MR. SOFFELL: Okay, I understand.

MR. SHIPLEY: Versus 100% fixed rate --

MR. NORTON: Larry, please don't talk over one another. The tape will not pick it up.

MR. SOFFELL: I'm probably guilty of that, too.

MR. VOLLMER: We got into the aspect of checkers, and let's see -- I think maybe I'll --

MR. SOFFELL: One other question if I may. Again, it's related to gaps, and I think you may have addressed this already, but to just make sure I understand. You look at the as-built gaps, so if it's not symmetrical, indeed the asymmetry of -- or the fact that there's different clearance on one side vis a vis the other is reflected in the analysis, and then the thermal motion, or thermal displacement, is evaluated against whether or not that gap is closed.

MR. SHIPLEY: That's correct.

MR. SULLIVAN: I'd like to go back to joint releases

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for a second. I thought these particular concerns had been characterized mainly as lack of procedure. But I think with respect to the joint releases, there was also technical disagreement. That's -- as I understand -- I know you haven't seen the report, the investigation report yet, but from my reading it, it seems as if there was a technical disagreement with respect to whether it was appropriate to release that particular joint. Can you address that, Larry/

MR. SHIPLEY: The particular joint, I --

MR. SULLIVAN: Maybe we can get you some more information and then do it later.

MR. SHIPLEY: That might be beneficial, and let me say that in some further investigations we made after the NRC discussed with us at the site this problem or this concern, we went back and looked at additional calculations, in fact, spent several man days looking through computer calculations and we only found one other case were a joint release was used. So now we have two cases where joint releases were used in small bore piping. We're talking about a fairly -- I recognize in one case we're talking about a technical academic subject, but I think its total proves things indecisive in some way.

MR. SULLIVAN: Yeah. Let me ask you a question that may alleviate the need for further checking. From your point of view, now you looked at these two cases -- maybe not

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just you personally, but a number of you, and concluded that you think what was done was appropriate, or have you decided that revision needed to be made in the analysis?

MR. SHIPLEY: Can we get back to you right after lunch perhaps?

MR. SULLIVAN: Yes.

MR. MANOLI: This is Kamal Manoli. I have a question on the incorporation of gaps in the thermal analysis. You were saying that the gaps are included in the model. Are you using a non-linear program, or how do you know when the gap's closing and then the piping starts to feel the thermal, unless you're applying the rule in increments, or --

MR. SHIPLEY: Yes, essentially we do the latter. When we would do is to provide -- to physically displace the type -- it's difficult to explain.

MR. MANOLI: I'll understand. Go ahead.

MR. SHIPLEY: We would get -- we would physically displace the pipe by the amount of the gap. That would be the first step that the computer would -- when it's doing its number crunching, that would be the first step that it would do is displace the pipe. That would put, let us say, a negative load at that restraint, the restraint that I displaced. I would then heat the pipe up. If that -- if the load on that restraint goes positive, we know the gap is closed, and there is a net load on the restraint. If the restraint load

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stays negative, we know that the gap load didn't -- the gap was not closed, and therefore there is no net load as a result of thermal expansion on the restraint and that is done and clearly documented.

MR. MANOLI: Okay. In cases when you have closing of a gap, how do you assess the impact on the pipe itself?

MR. SHIPLEY: When the gap closes?

MR. MANOLI: Yes. Because it closes halfway during thermal movement. The pipe displaces a certain amount, the gap's closed.

MR. SHIPLEY: The effect of, at the same time displacing the pipe the amount of the gap, and then -- essentially heating the pipe up, will give you the same effect as if you had a nomineered program whereby the gap would close and then continue to move.

MR. MANOLI: That will probably be as far as the design support goes, but not --

MR. SHIPLEY: And the pipe --

MR. MANOLI: Well, that's -- see, once the gap is closed, all you're getting is a positive reaction on support. You don't really know what is the stress on the pipe is.

MR. SHIPLEY: No, we're doing this in a piping stress analysis program.

MR. MANOLI: Which is a linear program?

MR. SHIPLEY: Yes, but they're --

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MR. MANOLI: It's really a problem. It's not a non-linear problem.

MR. CLOUD: That's the answer, yes.

MR. VOLLMER: Could we get that on the record? I couldn't hear you down here, and you don't have a mike any place near you.

MR. CLOUD: I'm Bob Cloud, and really I was talking out of turn because we just happened to be next to each other, and I apologize to Mr. Shipley.

But I think the issue that he was addressing is that the question about whether or not the pipe gets confused with respect to what causes the stress, and I was pointing out that the program, as we understood it when we reviewed it, is a linear program, and so to assume a position of the original tensile load combined with the effect of the thermal expansion will combine linearly and leave you with the correct physical situation.

MR. MANOLI: That's stress you're talking about.

MR. CLOUD: Yes.

MR. MANOLI: Okay.

MR. NORTON: When do you want to break?

MR. VOLLMER: Well, let's -- it could be now or after one more topic.

MR. SHIPLEY: I have one more brief one.

MR. VOLLMER: Yes, stress walkdown. Okay.

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MR. SHIPLEY: The observation in 583 is wondering which -- it is felt that the stress walkdown procedures were inadequate because they didn't address some of the information and documentation clearances, in particular, that are required by 79-14. First of all, the stress walkdown program was never conceived to be any part of the 79-14 Bulletin requirement. The stress walkdown program was conducted approximately four months ago, and it was developed on this project to identify potential interferences before plant heatup commenced, and that was its only requirement.

It -- allow me to read a short section from the procedure itself, paragraph 1 which is the purpose of the procedure: "This instruction provides guidance for the stress walkdown effort. The purpose of this effort is to review the installed condition of large bore class one piping and confirm that they satisfy the design calculations. Since confirmation of the dimensions given in the piping isometric or piping support drawing are within the scope of the as-building program, no detailed measurements are required as part of the walkdown effort."

Now the -- again, just to reiterate. The stress walkdown program was clearly not set up to function as any part of the 79-14 verification. It was not designed to measure things.

We agree in discussions with the NRC that 79-14

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required measurement of contained -- measurement and documentation of penetration through walls and floors and containments and so forth. Penetration required measurement and documentation. These -- the 79-14 walkdowns that were done in 1980 and 1981 should have included that documentation as part of the package. They did not.

While we believe that the heatup that we have just gone through and the stress walkdown that we have just gone through provides adequate assurance that we're not going to have any significant problems when we heat up, the project is going to go back and measure the penetrations where the pipe is in the cold condition in order to completely satisfy the requirements of NRC Bulletin 79-14.

So we -- what I'm trying to do is to separate the stress walkdown procedures from the requirements of 79-14. They were not at all aimed in the same direction. And they -- although the results of both of them is to assure that the piping system, as designed, as built, analyzed and when heatup commences, that they will respond as analyzed. That's the goal of both of those programs, but they're two unique programs.

I might mention also that there is no NRC -- or NRC requirement or project commitment to do a stress walkdown.

That's all I have on that one.

MR. NORTON: Mr. Vollmer, I suggest we also cover

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V-B, Item 4 which is -- deals with the stress walkdown but has a lightly different twist. While we're on the same subject, I think it would make sense to get that one out of the way, and then have questions.

MR. VOLLMER: All right.

MR. NORTON: You ready, Larry?

MR. SHIPLEY: Yes.

MR. NORTON: A little bit of a surprise.

MR. SHIPLEY: The V-B 4 alludes to the fact that there were certain interferences that during the walkdown, were not identified. And we believe that these apparent interferences were indeed looked at. In other words, the engineer who was walking down a system with his documentation package, saw these things but recognized that the piping moved only slight amounts, not a significant amount, and realized that insulation in small amounts will crush and allow the piping to move as designed, and did not so document. The procedure does not require documentation of each and every potential interference that's identified. If the engineer believed that it was significant interference, he documents it and the procedure describes how to disposition that finding.

There were several cases that were identified that fit into that category, where the movement and the clearance were relatively small interference, an eighth of an inch type of thing where we're confident that the walkdown engineer

believed that the insulation would crush locally and relieve that minor interference.

There was one case where the piping was already in a hot condition, and while it appeared that the piping had to move a significant amount, two inches, it only had a half an inch to move. These are not accurate movements I'm giving you. They're for instances. The piping was already in its hot condition, so it didn't have to go anywhere.

So there were items of that nature that were found, several cases where there -- we believe some judgment was used on the part of the walkdown person and he did not document it. And the primary issue here is that it was not documented.

MR. VOLLMER: Questions?

MR. KNIGHT: This is Jim Knight, Larry. A number of times now you've said we believe that the walkdown engineer was cognizant of what to the first glance might appear to be an interference, and discounted it. Is this based on talking to walkdown engineers, interviews or some o er means of trying to get a handle on its source?

MR. SHIPLEY: Let me have Mr. Tateosean answer that, because he was in charge of it and we didn't have a whole troop of people doing this. It was a very well-controlled program and there were, in fact, three people that did the walkdown of all the piping. Dave was in charge of it.

MR. TATEOSEAN: This is Dave Tateosean. In total

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on the stress walkdown, we had eleven people, five teams of two people which were both engineers, one a piping stress engineer and the other a pipe support engineer, and then I was the lead.

On cited interferences, I've gone back and talked to the stress engineer who was on the walkdown and I want to note here that other interferences on these pipes were noted. On what we call the stress walkdown file reports. SWEEPER's was the acronym we used. Other SWEEPER's were written on other interferences on these lines, but in his judgment, what he saw here were really interferences that weren't interferences because the -- it was such a slight interference. You're talking about interferences here of less -- a sixteenth of an inch or less. Typically you had an inch and a half or so of insulation, and we're talking about calcium silicate insulation and it has the ability to crush that much or more.

So these really weren't the kinds of intereferences that would cause increased stresses in the piping. Therefore, they were non-interferences.

MR. KNIGHT: Just to give me a handle on the scope of the effort, say you had five teams of two people. And over what period of time, say, in terms of hours, man-hours, or such, were the walkdowns conducted?

MR. TATEOSEAN: The effort started in mid-August, and went through to the end of September with that many

people and then it began -- the manpower began wrapping down, and the effort closed out in beginning of November, and at that point, it was down to a few people.

MR. KNIGHT: And these were done with the plant at temperature or some time --

MR. TATEOSEAN: No, these were done prior to -- with the plant cold.

MR. FRIEND: Dave, please describe a little bit the recent walkdowns we've been doing with the plant hot. I think that would be of interest.

MR. TATEOSEAN: Okay. In addition, during the initial RCS heatup after fuel load, we again conducted walkdowns of all piping that was subjected to significant thermal displacement, either being temperature such as all the RHR piping was inside containment or outside, and also piping that was significant -- that was subject to significant thermal displacement such as the CCW piping which was cold, but where it attaches to the reactor coolant pump, it sees a couple of inches of displacement.

We looked at all that piping, compared the actual measurements that we obtained against what was predicted by thermal analysis, observed to see if there were any interferences. It was quite a thorough walkdown. It encompassed, again, a total of ten people. Again, these were stress engineers. There was one person on the team, and the other

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person was a construction field engineer. They went out, took measurements, observed clearances. As a result of that, there were some minor pipes modifications made, some minor insulation copes, and that's about it.

MR. KNIGHT: And this most recent effort was connected with the same people or a different group of people or -- I'm just trying to get a feeling for the commonality that might be there.

MR. TATEOSEAN: Three of the people were common to both efforts. Two of the stress engineers who did the walkdown and myself. Some of the construction people that participated in the RCS heatup walkdown were involved in the SWEEPER walkdowns as far as -- the stress walkdown as far as resolving problems. Everyone had been familiar with that.

MR. KNIGHT: Is the most recent effort where you went through with the plant at temperature and actually measured -- as I understand it, you took measurements to relate motion to predicted motion?

MR. TATEOSEAN: Yes.

MR. KNIGHT: Has that been documented?

MR. TATEOSEAN: Yes, it was done to Procedure P-36. I have copies here if you want.

MR. KNIGHT: That's all piping in the plant? Doesn't make -- small bore, large bore, no differentiation then?

MR. TATEOSEAN: Yes. Included all piping attached

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to the loop out to the first anchor, if it was cold piping such as the case for component cooling water to the pumps. Seal injection, safety injection piping included. All hot piping such as RHR piping whether it was inside or outside. It included main steam feedwater, inside containment. Main steam outside containment measurements were not taken. That will be done during power extension. However, it was subject to visual inspection.

MR. FRIEND: Small as well as large piping?

MR. TATEOSEAN: Yes. Seal injection, for example, is small bore piping.

MR. BOSNAK: Bob Bosnak. If I can pick up on that again, because I think what Larry said and I jotted this down-- he mentioned large bore class one only, but that's -- maybe that -- he meant that to be what was done so far? Because there is a requirement that all of the piping systems, the Class 1, 2 and 3, that they're -- that they be checked for thermal expansion and they be checked for steady state vibration, and transient vibration to be sure that -- this is part of the preoperational testing program. So I guess I'm taking issue with one of the remarks that Larry Shipley made that there wasn't any -- this has been a standard in our standard review plan for a large number of years, that this be done. And I don't know of any plant that doesn't do it including, perhaps, your own.

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MR. TATEOSEAN: When we say Class 1 piping, we're referring to ASTM -- I mean, either Class 1, 2 and 3 piping. In the PG & E classification system, we have Class 1 which is all safety-related piping, and then Class which is the non-safety-related piping.

MR. BOSNAK: That's a good clarification for the record. I wonder if Larry might like to comment on the fact that there is a requirement.

MR. SHIPLEY: You have to -- we clearly know we need to review the piping during the initial startup, during the initial heatup of the plant, and in operation for the steady state vibration. The program I intended to refer to was the pre-heatup program, the stress walkdown, whereby we go through and try to catch things before they become interferences.

MR. BOSNAK: Okay, I understand.

MR. NORTON: I think we all understand, but I'm not sure the record is clear. When you say the program you were referring to being the stress walkdown program that there was no requirement for?

MR. SHIPLEY: That's correct.

MR. NORTON: Okay.

MR. VOLLMAN: Further questions?

MR. FAULKENBERRY: Just one quick question for clarification. You said that you still have not completed your 79-14 walkdowns as related to tolerance measurements?

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You mentioned measurements, and that you have to do this?

MR. TRESLER: This is Mike Tresler. We completed our 79-14 walkdown, issued a report and the NRC reviewed the results and signed off, and that was done in 1981 prior to receipt of our initial license. I think it's a little bit misleading to talk about any reviews being directed to 79 -- to satisfy Bulletin 79-14 requirements that took place after that. The first walkdown that was done was a walkdown to verify the piping information contained in our design drawing accurately represented the as-built configuration from the standpoint of geometry and that sort of thing.

The first 79-14 walkdown met to the letter all of the requirements of the 79-14 bulletin with the exception of the measurement of the clearance between the pipe and the penetration through walls or floors.

We consciously in 1979 did not include that requirement because the plant had already been subjected to a hot functional test, and it was the decision on the individual responsible for piping at that time that it was not necessary to accomplish this measurement because adequate clearance had already been verified as a part of the hot system checking.

And that was identified in our program as an exclusion. And so I'm sure that the NRC reviewed that exclusion.

Now, we've -- since we don't have that measurement reported, we have made a commitment to the NRC to go back out

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and measure the clearance between the piping and the penetration and to record that dimension on all of our piping isometric drawings.

MR. VOLLMER: Thank you. Okay, it's time for an audit. As I have it, except for Item XVI-1, we're complete down through V-A-4. That's about a third of the way in three and a half hours. Give or take a little. About a third of the way, the way I count anyway.

MR. NORTON: Almcst half.

MR. VOLLMER: Okay. Let's take a break for lunch, and reconvene at 1:30.

(Whereupon, at 12:34 p.m., the hearing was recessed, to reconvene that same day at 1:30 p.m.)

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A F T E R N O O N S E S S I O N

MR. NORTON: Okay. Let me give you a little preview of what we're going to do. The next one is V-A-5. That's going to be combined with two others, which are on the second page, III -- Criterion III, Items 2 and 8. And that will be will be Mr. Oman doing those three right now. Then we'll go from there.

MR. MANOLI: This is Kamal Manoli from the NRC. I just had followup question on the gaps on the walkdown. There was a statement made that the gaps were not measured because the hot functional testing did not require doing that measurement?

MR. TRESLER: This is Mike Tresler. The gaps we were speaking to were only the gaps between the piping and the penetration. The gaps that exist between the pipe and the support, between an attachment to the pipe and a restraint are all as-built and recorded. So we're just talking about that very small area of the plant.

MR. MANOLI: Okay. Why did you believe it was not needed?

MR. TRESLER: We did perform walkdowns to verify that we had adequate clearance, and that was done as a part of the original 79-14 effort, and it was also monitored, the clearance was monitored during the heatup. The 79-14 bulletin requires these things to be measured, so it does take some

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interpretation to make the measurement to measurement and record it. It's just that we felt that generally the gaps between the piping and the penetrations are large, and if we would have a concern or problem, it would have been identified during the walkdown when the plant was heated up.

MR. MANOLI: Did the gap size exceed the predicted thermal expansion of the line all directions?

MR. TRESLER: Did the gap design -- it didn't -- the penetrations that we're speaking of are penetrations that are not designed to be a restraint to the pipe.

MR. MANOLI: Yes, through walls, yes.

MR. TRESLER: Yes.

MR. MANOLI: Was the gap provided around the pipe all around --

MR. TRESLER: Yes.

MR. MANOLI: Did it exceed the predicted thermal growth of the line?

MR. TRESLER: Yes.

MR. MANOLI: Or thermal movement of the line?

MR. TRESLER: Yes.

MR. MANOLI: All around?

MR. TRESLER: Yes. And that was verified again in the walkdowns that were conducted -- that we termed the stress walkdowns. The concern, though, is that the verification of adequate clearance was not recorded. It is not that it wasn't

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checked, it wasn't recorded. I don't think we're sure --

MR. MANOLI: I think I explain to you the point I'm trying to come across.

MR. TRESLER: You're saying if the predicted displacement was one inch, did we verify that we had one inch --

MR. MANOLI: All around.

MR. TRESLER: 360 degrees around the pipe.

MR. MANOLI: That's correct.

MR. TRESLER: I guess my answer to that is no. We predicted -- we reviewed the piping and the clearance between the pipe and penetration to the extent necessary to insure there was adequate clearance to prevent thermal restraint based on the predicted movement by the piping analysis.

MR. SHIPLEY: I think perhaps we also ought to investigate a little bit the -- when you're talking of did we do it, or will we do it, or will we verify that the piping moved as predicted by the analysis?

MR. MANOLI: Right, yes.

MR. SHIPLEY: And -- well, I'll turn it over to Dave.

MR. TATEOSEAN: This is Dave Tateosean. As far as the stress walkdown, when they did that, they made sure that there was adequate clearance inside of the -- between the pipe and the penetration in the direction of the anticipated movement.

MR. MANOLI: Anticipated based on the analysis?

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MR. TATEOSEAN: Yes, this is based on the computer analyses of piping.

MR. MANOLI: Okay. What did that -- I mean, a lot of times when you heat the line, you don't get what you get -- what you assumed in the analysis or what you thought you were going to get. That's a possibility, I think, exists when you have a line that's looping around in many directions.

MR. TATEOSEAN: During the heatup, the line will be monitored. We did have some cases where the lines are moving in different directions. However, in each of those cases, we investigated this, and found out the reason why that was happening and corrected it. Right now, what we have in the plant is all the pipes are moving in the right direction that the analysis -- in the same direction that the analysis predicted within our acceptance criteria.

Our acceptance criteria, the way we used it, we didn't allow for the pipe to move in a direction different from what the analysis say. It might have moved a quarter of an inch less than what the analysis said in the same direction.

MR. MANOLI: So that's what you have now, that the pipe would move in the direction that -- is that what you're saying?

MR. TATEOSEAN: Yeah.

MR. FRIEND: Dave, can we say that we have checked these penetrations with the pipes in the hot operating

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condition, and we don't find any interference or confinement of the pipe at those conditions?

MR. TATEOSEAN: There's one penetration where the clearance closed up to a very small amount. All the rest remained clear. The one that closed up, it wasn't a hard contact at all. There was just a little bit left. And we corrected that. There were no cases where the pipe was physically bound up inside of penetration during RCS heatup.

MR. FRIEND: Okay.

MR. TATEOSEAN: And like I said, we monitored all the hot piping. When people did the walkdowns they started at one end of the pipe and went to the other. And we just didn't have any occurrences where the piping was physically bound up inside of penetration, either floor or a wall penetration.

MR. MANOLI: And that's still going to be implement in all other installations, or -- I mean, that's --

MR. TRESLER: For all modes of operation. We have another walkdown that we perform after we get the full power and as we --

MR. TATEOSEAN: Yes, there will be walkdowns performed during power ascension, and that will be on essenti a room by room basis, not just looking at hot piping, but cold and hot piping.

MR. OMAN: Okay. I'm Bob Oman, and again, I'm

to address the topic generally of quick fix or pipe support design power clarifications, which is again, the item on the list here Item V-A-5 from the transcript which indicated a lack of procedures to control field deviations under this program, and also Criterion III-2, lack of subsequent review and approval of authorized tolerance clarifications for small bore piping, and Criterion III, Item 8 a program breakdown in that modifications exceeding the intended scope of this program were made.

In January of 1983, a special team of pipe support engineers was established within OPEG to provide direct engineering liaison between general construction resident engineers and piping contractors, craft personnel. And the purpose of this direct engineering liaison was to provide expeditious resolutions of minor construction problems in the installation of both large bore and small bore pipe supports.

This program activity was established initially with an OPEG guide No. 4 which was issued in January, on January 7th, 1983. It was subsequently superceded by a project engineer's instruction No. 12 in March of 1983. Those two documents are consistent and define the responsibilities and authorities of this group. And essentially, it defines a field construction problem related to pipe supports as a support installation difficulty that can not be resolved within the relatively restrictive tolerances of the construction

tolerance document of the piping contractor, which is designated ESD 223, entitled "Installation and Inspection of Pipe Supports."

That -- the tolerances defined in the ESD 223 are applicable to any pipe support without additional engineering justification. This pipe support tolerance clarification program was established with pipe support engineers in the field doing evaluations of construction installation problems and allowing deviations in design beyond the allowance in ESD 223 but still within the basic design criteria for the pipe support, such that the final design of the support would be acceptable.

This team of engineers was physically located in the plant, and as these construction problems developed, they would be referred to by the craft folks, and by the resident engineers, and they would, on a case by case basis, make a judgment based on their knowledge of M-9 which is the guidelines for design of Class 1 pipe supports and restraints for the project, the design criteria for pipe supports. They would make a judgment on a case by case basis whether an expanded tolerance, a deviation beyond that specifically allowed by ESD 223, could be made while still maintaining an acceptable support design.

For requested deviations that exceeded, in their judgment, their ability to, on the spot, judge a hangar

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modification, would be acceptable, those requested deviations were referred to engineering by the Diablo Problem Program which Mr. Tresler had discussed earlier.

Also, those modifications which -- or those hangers which a preexisting condition was determined to be unacceptable were not handled under this program. They were documented by discrepancy reports within Pullman Piping Contractor and General Construction.

Those deviations which the pipe support engineer felt in his judgment could be documented, were documented on individual tolerance clarification forms which were filled out to define the deviation which was authorized, signed by that engineer, and were -- became a part of the design package for that support, such that the quality assurance standards applied to the complete package. And it was treated exactly as the original design package was.

Upon completion of construction of that support, the as-built package, the entire as-built package of that support, was included in the original design and any subsequent tolerance clarifications were all incorporated into one as-built package which was returned to engineering for acceptance of the final as-built condition in accordance with project procedures. And the specific procedures which governed that were P-10, I-37 and I-40 regarding as-built. review and incorporation.

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During this as-built review process, the support design was reviewed and any calculations that were necessary to justify or qualify the design as it was installed were performed. And where qualification could not be performed, or could not be shown -- sorry. Where qualification could not be shown, a design revision was made and a new design change notice was issued to cause the hanger to be modified to a qualifiable configuration.

Therefore, the tolerance clarification was never the final design qualification for the pipe support. That was always subject to subsequent review and final acceptance as part of the as-built program.

In August of 1983, there was a PG & E quality assurance audit of OPEG and the control of design changes within OPEG. And that audit concluded that there was effective control of design changes, but there was a finding with respect to the use of tolerance clarifications, and identification that there were design changes being made to supports under this program which appeared to exceed the intended scope of a tolerance clarification.

That was recognized and there were instances where the program's intended scope was, in fact, exceeded.

As a corrective action for that quality assurance finding, we continued to re-emphasieze that tolerance clarifications program scope was not intended to include redesigns

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of supports. Nonetheless, the fact that every tolerance clarification is included in the as-built package and is reviewed as part of the final hanger acceptance, leads to the conclusion that that particular finding would not affect the final qualification of the supports.

Therefore, in summary, the tolerance clarification program was neither a substitute for nor a deviation from the formal design and construction quality assurance processes for pipe supports. Procedures did exist to authorize and control the work under this program. It is recognized there were, on occasion, tolerance clarifications which exceeded the intended scope of that program. But the fact that all of them were reviewed as a part of the as-built acceptance makes that concern of little consequence.

Therefore, this particular question of tolerance clarifications does not have a generic implication to the qualification of pipe supports.

MR. BOSNAK: This is Bob Bosnak. Could you characterize the kinds of deviations that you were talking about? You said, I think, they are not intended to include a redesign but could you characterize the types you are talking about?

MR. OMAN: I will characterize several of the things that are typical of the use that the quick fix was made for, or a tolerance clarification was made for.

When a pipe support was issued, a base plate may

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have required additional anchor bolts in the concrete walls and when rebar was run into, when the -- in the process of installing those bolts, it was necessary to adjust the configuration of the base plate on the wall to miss rebar. That sort of adjustment would be, for instance, typically covered by quick fix, the rotation of a base plate to miss rebar.

The addition of additional support members to -- changing of -- material substitution as an example would be -- could be authorized under a quick fix, under a tolerance clarification if the member strength in the judgment of the engineer was going to result in an equivalent design.

MR. BOSNAK: Were there any of these tolerance clarifications that were kicked out by the final verification?

MR. OMAN: Let me understand your question. When the as-builts return for final acceptance, there definitely were -- was an as-built rejection rate, that the final as-built package as it was returned to engineering could not be qualified by calculation, and it was necessary to redesign the support, or issue a design change to the support to put it into a qualified configuration. So yes, in answer to your question, yes, there were cases where as-builts were not acceptable as they came initially into engineering and had to be modified again.

MR. BOSNAK: Do you have any sort of percentage or numbers to give some idea?

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MR. TRESLER: This is Mike Tresler. The as-built rejection rate varied between 2% to 4%, and the rejections resulted both from changes allowed by the tolerance clarification effort as well as deviations that were made by construction which may not have been authorized by a tolerance clarification.

MR. BOSNAK: Was this both in large bore and small bore or --

MR. TRESLER: The 2 to 4% that I'm speaking of is large bore.

MR. BOSNAK: Large bore.

MR. TRESLER: It's approximately the same for small bore.

MR. TAYLOR: This is Jim Taylor. I had a question, too. Using this process by which the engineer used the quick fix DC type thing, what you're really saying, if I read you right, is when the finalized bill was reviewed, if the dimension was changed that affected the calculations that had previously been done, and the calculation, in fact, was repeated to be sure that whatever he granted in the field was acceptable? So that if I went today and audited all your as-built packages, and I saw some DC's, quick fixes approved by an engineer and a change in the dimension or some other attribute, member size, I would then be able to proceed from that to be sure that the basis of the design had not been disturbed. You

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reran those calculations and approved them as acceptable?

MR. SHIPLEY: The engineer's disposition of the as-built could have taken really three different directions. In the worst case, he could have completely rerun the computer analysis.

MR. TAYLOR: In the complicated -- most complicated case?

MR. SHIPLEY: In the most limited case, yes. Which would mean revising the hanger calculation and so forth.

In a second case, it might have resulted in -- this is the in-between case, if you will. The engineer, by making some hand calculations, could satisfy himself and the checker, that the original calculation was adequate.

In the third case, the engineer would look at it and determine that the amount of deviation was really quite insignificant to the whole process and everything would stay as it is.

MR. TAYLOR: So he really had three ways of doing it? One was to either rerun completely or to run a section or an overcalc or do nothing.

MR. SHIPLEY: Do nothing.

MR. FRIEND: I think there was a fourth one, too, and that was when it fell outside of the bounds of reanalysis to modify the support further to make it qualify.

MR. SHIPLEY: Yes.

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MR. TAYLOR: Then did the people who reviewed and approved the original set of calculations, does that go back to them for final checking? And is that process in effect? What I'm getting at is you're supposed to have the same people who approved the original design work, not the identical individuals but the same process, look at the --

MR. SHIPLEY: The same design organization.

MR. TAYLOR: Yes.

MR. SHIPLEY: Yes.

MR. TAYLOR: And the same levels of review.

MR. SHIPLEY: Yes, that was done. I might also point out that if, in the case that Mr. Friend just spoke of, where analysis had been done, and the as-built support as built by the tolerance clarification could not be shown to qualify, a new design was made, the calculations validated the new design, that new design was sent to construction, it was constructed as built and sent back to the design organization for review.

MR. NORTON: Larry, could you add how the engineering organization was aware that something had been built differently? In other words, when it came in to review the as-built, was there anything that drew their attention to the fact that it was different than as originally analyzed?

MR. SHIPLEY: Yes, there was -- on the tolerance clarification form, there was a place for where the tolerance

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clarification construction engineer described what those -- what deviations had been allowed during his tolerance clarification. And that package -- the entire tolerance clarification package, including the as-built drawing, came to San Francisco in the case of large bore, for review. So there was an -- in addition to the as-built drawing which described in detail what the final construction looked like, there was a tolerance clarification package that came along with it that also described it.

MR. VOLLMER: The calculations would not necessarily be redone when they received that package, though?

MR. SHIPLEY: They would not --

MR. VOLLMER: Necessarily --

MR. SHIPLEY: Necessarily be redone.

MR. VOLLMER: It was a matter of judgment at the time?

MR. SHIPLEY: Yes.

MR. TAYLOR: I'm going to ask -- this is Jim Taylor. I'm going to ask, is this quick fix practice strictly limited to this particular aspect? We're asking the generic question. We're always concerned about the control of design, and the decision to make changes in the field.

MR. OMAN: Is it limited to pipe supports?

MR. TAYLOR: Yes, that's my question.

MR. OMAN: That is correct today. There was a time

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in the spring of 1983 when we -- there were -- there was an extension of that program to include certain civil engineeering problems as they related to conduit supports and HVAC duct supports specifically. That process, however, was recognized to be inappropriate. There was a discrepancy report written to document the fact that we recognized that was an inappropriate extension of this program. All changes that had been done under that extended program were reviewed, and appropriate design change notices were issued to document the changes in design. And that was discontinued in the May time frame of 1983. And since that time, there has been no other program of this nature except for pipe supports.

MR. VOLLMER: Could you say why it was inappropriate there and not here? Maybe I missed something.

MR. OMAN: We did not have a clear enough definition of the allowable tolerance variations at the jobsite with regard to those items, the conduit supports and the HVAC supports. That was -- the design of those two commodities specifically was being done in San Francisco, and we did not have people familiar enough with those designs to be put in the field to do the same sort of approach, so we discontinued it.

MR. FRIEND: I think the review process here in San Francisco was the same. I think, perhaps, we might have been finding that, whereas in the case of piping, we were accepting

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most of the changes. In these other commodities, because of lack of tolerance definitions, we were having to reject them. And so that was the basis for this change.

MR. SULLIVAN: Ted Sullivan. What percentage of supports would you say went through the quick fix process? Say, small bore and then large bore.

MR. TRESLER: It's estimated that the tolerance clarification was applied to approximately 70% of the supports.

MR. SULLIVAN: Small or large?

MR. TRESLER: Small and large.

MR. SULLIVAN: Small and large.

MR. TRESLER: I would expect, although we don't have these figures, I would expect the frequency of application to be -- for small bore, to be lower.

MR. SULLIVAN: I think at the beginning of your discussion, you mentioned something about procedures, that you did have some sort of -- could you describe that a little bit further?

MR. OMAN: Yes. The procedure that established this program was initially in the form of an OPEG guide, and subsequently, it was substituted for by Project Engineering Instruction No. 12. That instruction or instructions received the approval of the project engineering team in San Francisco as well as the quality assurance organization. It defined the responsibilities and authorities of this group

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of engineers who worked in that program. It defined a field construction problem for a pipe support as being a construction difficulty which could not be resolved within the tolerances provided in ESD 223. A problem that required modification or deviation greater than allowed by a construction tolerance document, but which still would result in acceptable hanger qualification in accordance with the project criteria, M-9, for design of pipe supports.

MR. SULLIVAN: You said it mentioned responsibilities and authorities. Did it also discuss process? A process to be followed, or a procedure to be followed.

MR. OMAN: It defined that a tolerance clarification team member would have these construction problems referred to them by a resident field engineer or the craft, that the engineer would review the problem and make a judgment as to whether the deviation could be allowed on the basis of a tolerance clarification. If it could, he would document it with the attachment to that procedure which is a tolerance clarification form, showing what is -- what modification is being authorized, and a signature spot. If he couldn't, in his judgment, could not allow that, it would be rejected as a tolerance clarification and would be referred to the general construction organization for creation of a Diablo problem and requesting a new design. And it specifically also allows that the final acceptance of the tolerance clarification is

done in accordance with the project as-built procedures, I mean, accepting as-built for that pipe support. Those are -- those basic kinds are defined in that procedure.

MR. SULLIVAN: The instructions you mentioned apply to both small bore and large bore?

MR. OMAN: That's correct.

MR. NORTON: To assist the staff a little bit in finding some detail on this, there was an affidavit of -- well, it was Mike Tresler and others. Tresler was the first name on the affidavit dated March 6th, 1984, and at pages 39 through 43 of that affidavit is a great deal of detail about the history, the dates, the procedure numbers and so on involving this subject. And that is attached as Attachment B to PG & E's response to Motion to Reopen on Design Quality Assurance.

And I know that a lot of you don't routinely get those kinds of filings, or perhaps, some of you never do, I don't know. But it is there in great detail and you might want to review it. We will quote it in the submittal that we give you Wednesday night. We'll lift it and quote it but if you want to look at it advance, it is there.

I'm sorry, that's Attachment A, Breismeister et al., not Attachment B.

MR. VOLLMER: Proceed. Ed Kahler, I guess, is next.

MR. KAHLER: This is Ed Kahler, and responding to

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Criterion V-A, Item No. 6, the observation as stated on the transcript page 35 was the use of outside references and data without adequate controls.

In response to this concern, we feel that we responded to it completely in our February 7th submittal. For the staff questioned such references also during their allegation investigation. There were listed -- in that particular submittal, there were listed a number of examples of the type of information that were in the field at the design engineer's desk.

We fully expected that experienced engineers commonly have general reference material as a part of their personal and professional library. This type of material includes textbooks, handbooks, typically provides standard formulas, tables, Code discussions, example calculations, rules of thumb and other simplified conservative methods commonly used in the industry. As general reference material, they are not controlled, and do not constitute acceptance criteria.

The project engineering procedures, particularly the engineering manual procedure 3.3 on calculations, provide for the use of references such as textbooks, catalogs, and other accepted industry techniques in specified calculations. The references when used in that instances must be documented to the extent necessary that the checker can check the

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calculations sufficiently without having to refer back to the originator of the calculations.

In such cases, it is required that they be documented as formal references in the calculation which they use. The use is then checked and approved via the calculation review and approval process.

In our investigation in this area, we know of no instances where references were improperly used in calculations. For example, in one instance we found a non-project specific document was referenced as a source on a double cantilevered deflection formula used in the calculation. It was a standard engineering formula not unique to any particular project, and need not even have been referenced in the calculation.

We feel that adequate control of standard outside reference material is provided through the review and approval process of the calculations.

Where project-unique data are required, that information is issued as a design criteria memoranda. P G & E has accepted the fact that the basis of calculations could be more clearly identified in the specification of references, and in an effort to improve our quality assurance program, we have committed to revise our procedures to indicate that commonly used reference material will be reviewed and approved by the project prior to use.

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MR. VOLLMER: Would there be instances where specific delineation of the calculational procedures or criteria, parameters that should be used will be given to the engineer? If that were the case, and he used something else, would there be any -- would he be required to call it out in some other way, like a non-conformance or something?

MR. KAHLER: No, sir, I don't believe he would. If it's a standardly accepted methodology and he has documented his -- you know, how he used that particular item and where it came from, sufficient that the checker could go back and check his reference and satisfy himself that the -- it was, indeed, a correct application.

MR. VOLLMER: Okay.

MR. KAHLER: Any further questions?

MR. VOLLMER: Just go on.

MR. KAHLER: The next item is Item -- Criteria V-B, Item 1. The observation as described on the transcript, page 45, errors done in calculations possibly caused by inadequate checking.

Again, we have responded to this concern in our February 7th submittal, pages 9 through 14. We feel that the broad responsibilities of the checkers to assure that the calculation is sufficiently accurate and sufficiently free of errors to serve its intended purpose, that is, to document that the support meets its design requirement. We have

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reviewed the nature of the errors. They are minor. And the fact that the calculations, with these minor errors in them, can still be demonstrated that the support is acceptable, we feel is a strong indication of the overall adequacy of the checking function.

The engineering manual and procedure on calculations requires the checking of inputs which is the typical example of the types of errors found in the small bore calculations. Some of these supports were reviewed by the NRC staff were again among the most complex small bore supports in the plant.

These analyses have been reviewed by the project in detail, and have determined that no modifications are required as a result of the discrepancies. And the fact that no modifications were required, again, confirms our conclusion that the design process and the conservatisms are tolerant to minor anomalies, and the engineers responsible for the design of the supports have been insured that significant errors do do not exist.

In summary, the calculations were checked and signed by the checker as required by the quality assurance program. We have not been able to establish as to whether or not the noted errors were overlooked by the checker, or were recognized as insignificant to the end result of the calculation and therefore accepted. We realize that perfection is a goal of quality assurance, but it's difficult to implement in all

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cases.

Again, none of the errors discovered, when they were gone back and rechecked, required any hardware modification in order to satisfy licensing requirements.

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MR. VOLLMER: Any questions?

MR. KAHLER: What was you error rate? On the input area?

MR. KAHLER: Larry, do you have that information? We have worked out that statistic, I believe that we can find it if you give us a moment.

MR. VOLLMER: For both large bore and small bore?

MR. KAHLER: I believe that we have work it up, only for small bore. Again, the process -- in looking at the large bore, certainly has not indicated that we particulary have a problem with errors in large bore calculations.

MR. BOSNAK: For the small bore, beside the error rate, do you have number on what percentage of small bore piping was reviewed? Or re-reviewed?

MR. KAHLER: Yes, that information again was provided in our February 7th submittal. In the small bore area, ---

MR. SHIPLEY: Maybe I can say a couple of words. I think that it is important to remember what we call an error, the term gets used rather loosely and I think when a very experienced engineer sits down and is told -- I want you to go through this calculation and make sure there are absolutely no discrepancies, no deviations from exactly what is on the detail -- you can't deviate by one ten thousanth of an inch. You are going to find things in those categories.

It is very, very clear. Now, if you call that an error, then the error rate is going to be substantial. But, if you talk about errors that actually affect the overall adequacy of the calculations, then that error rate is very small.

MR. BOSNAK: Did you categorize the kinds of errors that crept into your error rate, so that you could say what the effect was? Put them in different categories?

MR. SHIPLEY: Yes.

I'm actually reading from the February 7th submittal: that acceptable with minor supplemental calculations or comments, is 78 percent. Acceptable with detailed calculations, which means that there was something found that the reviewer felt that without additional work, he was not able to justify it on the basis of the original calculation alone -- that was 17%. And, unacceptable is zero.

That was at the time of this document. At that time there were six supports that had yet to be completed. They have since been completed and they are also acceptable. So, that would bring the 17 to 22 percent, today.

Mr. Oman points out that that was out of one hundred and twenty nine support calculations in this review.

MR. BOSNAK: And what percentage does that represent of the whole small bore population?

MR. SHIPLEY: Except for about one or so -- I would

say about one hundred and ten. In the hundred to one hundred and ten range -- represent the complex calculations, and had computer runs on them -- out of approximately four hundred that have had computer runs so far. Computer analysis ---

MR. FRIEND: The first category was seventy some percent. Why don't you describe and give some examples about what you meant there.

MR. SHIPLEY: What would cause a hangar to be categorized in that category, are the lack of certain statements needed to document the conclusions reached. In other words, there wasn't sufficient documentation to allow a reviewer to easily go through and determine what went through the originator's minds.

It did not contain documented evidence of the evaluation of certain items which the reviewer thought was prudent to include in the calculated package.

And three, contained information from which the review could not make an assesment, and thus deemed it necessary to perform supplemental calculations in order to support his evaluation conclusions.

So, these are primarily documentation type errors, and they ---

MR. VOLLMER: I think that we all understand and appreciate the need to go back and look at these in view of the situation. But, it certainly confirms the bottom line

that the individual calculations are adequate and so on.

I think that the point of this particular problem, and it creeps up in other places is it calls into question the viability of the design control process -- the design review process. Could you speak a little bit to that?

In two ways. One, what is the normal procedure for design review in large bore and small bore piping, and secondly, what sort of instructions are the checkers given, who perform that evaluation. You correctly pointed out that for dealing in micro space the -- it would be foolish to point out every trivial error and so on and so forth. On the other hand, if we could get a feeling as to what the instructions of the checkers are, and exactly how they perceive their jobs, in doing this.

MR. SHIPLEY: Perhaps I could say a couple of words first about significance and I believe that I will answer you questions as I talk. I will try to encapsulate at the end.

The small bore -- if we speak of small bore first -- there is an intuitive ability of the designer, an experienced designer, to understand small bore piping. It is two inch in diameter and smaller. You have piping that size in your house. I think that people can just -- not people -- experienced engineers, have a feel for the design of the piping and the design of the supports to the point where almost without

calculations, they can design a support and then via calculations later, show that the support is acceptable.

They can change a support and show that it is acceptable, without doing calculations before hand.

This small bore represents a level of engineering that is commensurate with the product, and that is, very forgiving flexible small systems that respond extremely well during earthquakes and thermal expansion and so forth. The significance with which, or rather -- let me begin again.

The rigor that a checker uses in reviewing the calculations for small bore, are along those same lines. A checker will first be sure that he -- be sure that the originator has established that the design will meet the design standard. It functions in the right direction, it is a spring when it is a supposed to be a spring, it is a snubber when it is supposed to be a snubber, etc.

He will then look at the overall structure. The loads are so small in small bore an experienced designer can immediately tell if a -- most of the design of the supports are undersized or not. He will -- knowing that, he then begins to look at the input for the computer analysis.

And, as he goes through the input, he gives it a degree of checking that the more detailed the support gets the more detailed the cheker in general, goes through.

But a line by line review -- many times is not made.

Because, he realizes that the thing is capable of doing its job, and we are trying to prove it now.

But, that level of review, is perfectly adequate for the small bore piping supports.

When it comes to large bore, we are dealing with a slightly different story. The piping is large, it is very difficult to predict the loads, the pipe supports get extremely large -- space considerations are involved -- so there is a much greated attention to the design and checking of large bore than it is to small bore. As it should be.

As far as the normal procedure for the design of large bore, we have -- the normal Diablo Canyon procedure, we have an originator, a checker, -- at that point, before the final approval, we instituted -- I believe that we discussed it this morning, breifly -- we instituted a third level of review by an extremely experienced team of engineers. That would give a combination of overview and going to detail in some of the computer techniques that were used, the modeling techniques.

After that, it went to final approval and issue. In the case of small bore, as I said, it was felt that that intermediate step was clearly not required, and so we had the normal industry three step process, which was originator, checker and approval.

The instructions given a checker are basically the

same as the instructions that are given to the originator. And that is that the checker has to make sure that the calculation is valid. There are many ways that he can do that.

He is allowed to even repreat the calculation using an alternate method if he chooses. He can go through and verify that things are correct. He can use a combination of the two. We expect a checker clearly to have the same level of experience and education as the originator does and we believe that a specific set of instructions or a specific guidance to a checker is not really necessary.

MR. VOLLMER: Is he trained in the -- basically what his options are, as far as checking? Is this guy always a checker, or is he sometimes a checker and an originator?

MR. SHIPLEY: Yes, he is.

MR. VOLLMER: Okay, I agree that the checker does have those options in the design review process to take it to other forms.

The design review process does take a number of forms. Part of my question, which I guess that you answered, when he gets the calculation to check, he can use whatever methods he- feels are appropriate to accomplish his checking review, is that right?

MR. SHIPLEY: Yes.

MR. VOLLMER: And then he signs off on it and then

it goes forward in the process.

MR. SHIPLEY: Yes.

MR. VOLLMER: Could you give me an idea, with respect to say large bore piping, of whether it be a statistical number or an intuitive number -- how often does a checker run into a problem that he has to elevate to -- back to the originator or to the supervisor and say: Hey, I have got something here that I can't resolve?

MR. SHIPLEY: This will an -- we will choose the intuitive option. Almost in every case, the checker will have comments on the first calculation that is produced.

In very few cases, we estimate five percent, would be -- would the originator and the checker not agree on the substance of those comments, such as they would need to take that to a supervisor or a third party.

MR. VOLLMER: So the checker first tries to resolve his comments with the originator?

MR. SHIPLEY: Yes.

MR. VOLLMER: And then, if they can't be resolved, it would go to somebody else for resolution. I guess the supervisor. Now, does the checker and the designer, are they part of the same group of people? Do they report to the same supervisor, for example?

MR. SHIPLEY: Yes..

MR. KAHLER: This is Ed Kahler. I might add that

the engineering manual procedure 3.3 on calculations does specify the requirements of -- as Larry pointed out -- that they checker has to be of equal experience as the originator, and there are also specific criteria of things that he should be checking as he does his check.

Such as for computer calculations, the checking of inputs, the checking of the reasonableness of the output, the checking of the adequacy of the program for the application to the problem.

MR. MANOLI: This is Kamal Manoli.

The question about the of how it addressed the checking process, it doesn't distinguish between small bore and large bore or any kind -- it spells out how it is done.

MR. KAHLER: Yes, sir.

MR. MANOLI: So, whether it is small bore or large bore, as long as the checker is following the procedure -- as he checks number by number or do an alternate approach -- he can deviate from any of those options given to him.

MR. KAHLER: He has an option of choosing the approach that he wishes to take in doing his checking. For example, if a person were to choose the option of doing an alternate calculation, he would probably not look at anything in the original calculation. He would only be comparing the results of the end products -- whether they are compatible or not.

MR. MANOLI: I understand that.

MR. KAHLER: And whatever errors that there might be -- these minor errors in the original calculations -- he would never see those.

MR. MANOLI: I understand.

But he choses within those options given to him.

MR. KAHLER: Yes.

MR. MANOLI: Well, I want to get it into more general terms than small bore and large bore, because as long as he is getting two different ways to do it or three ways -- choose one and that is the one that he sticks with. It could be for small bore, large bore or anything, really.

MR. KAHLER: Well, but again, it is the individual checker's option -- this guy checking may use an alternate calculation, this guy may be a detailed review.

MR. MANOLI: But it is addressed in the engineering procedure, you say?

MR. KAHLER: Yes.

MR. TRESLER: Excuse me, this is Mike Tresler.

The engineering procedure as an example, say inputs will be checked, but it does not describe in detail how to go about checking those inputs, and I think what Mr. Shipley was trying to point out, that in the case of large bore, the checks would be more thorough than they would be on small bore. Small bore checks would be made, but it is certainly

possible, and I am certain that it happened, that checking was not made input by input.

But instead, he looked at the general model and judged it to be acceptable for the calculation that was being performed, and not a point by point check.

MR. MANOLI: Do you think that this would leave some kind of a -- because now that can be reused on the large bore. Another person -- which would claim experience in large bore would say: I can make a judgement.

So, it leaves, I think a hole here, where a person can just make judgements and think that the support is adequate.

Normally what I have seen, it is all checks -- number by number checks or alternate methods -- totally different, and if they match on the final result then it is acceptable.

MR. SHIPLEY: Yes, I agree, and I think maybe we mischaracterized this.

For the most part, that is what happens. I am speaking of -- to a -- let me start again.

To a checker who is looking at a very detailed computer input, and a beam is supposed to be five feet six and five sixteenth inches long. And, the person who did the input, forgot the five sixteenths. Is the checker going to document that exception? Is he going to call that an error?

I don't think so. I don't think an experienced engineer would do that, and that is the level of things that we are talkinga bout here.

MR. MANOLI: I understand that, but ---

MR. FRIEND: That if you will, is a tolerance on the verification. It does not speak that the verification has been done. It is done, but if the tolerance or threshold with which the review decides to document his work.

MR. NORTON: More importantly, I think that the question is: what is the difference, if any, in the level of review of the checker in large bore, versus that which you have described for small bore? And I think that you have to address that, you have to answer that.

I think that is the question, is it not.

MR. MANOLI: Well, anybody can use a procedure, once he adopts the procedure, he says I made a judgement that the support is acceptable, so it is really -- I understand Larry's point. If a checker in that case, might say: the member is longer than was assumed, but my judgement is acceptable, and that is usually an acceptable statement.

He doesn't have to redo any calculation, he does not have to say that it is wrong. Some simple statement. That advises that at least he has seen it, he has recognized the deviation there. That is the kind of thing that we are talking about. If there is no procedure that tells him, he

should look at everything. It is wrong that he would say: well, my judgement is so and so. And I think that is what the ---

MR. FAULKENBERRY: This is Bob Faulkenberry.

I guess I want to zero in on that 17 percent error rate, and maybe you are addressing some of that already, but how do you come to the conclusion that an acceptable check verification program was performed, if 17 percent of them required detailed calculations?

I would think these would be fairly substantive errors.

What I am getting at it: was there really a adequate check program being implemented or not? It appears to me that probably not, if you get these types of significant errors.

MR. SHIPLEY: Is it clear now that the 17 percent that we are talking about now is small bore?

MR. FAULKENBERRY: It is not clear, but if that is the case, we still have the question.

MR. SHIPLEY: I understand, but I thought perhaps that it is small bore, and going back to my earlier description of the understanding of small bore, might clear up some of it.

MR. TRESLER: First off, I don't think that 17 percent is the bottom line that we are driving to. The bottom line is zero percent.

In other words, after more detailed analysis or even corrective analysis, the bottom line is that were no supports that were found that were not defective, and no changes had to be made in the design. I think that Larry has tried very hard and has tried to establish the checking design process used in small bore.

He has recognized that you allow more latitude in small bore design -- it is more forgiving and because of that the degeree of checking, the degree of flexatative analysis an so on is less severe than it is with large bore.

And I think that is why we find more things in the design that are not exactly represented in the calculation even in large bore. Large bore, every thing is checked. In small bore, not every input was checked; instead it was -- in some cases yes, and in other cases the engineers did use judgements. The judgements were used more in the small bore than it was in the large bore.

And I think that Larry is trying to point out also that this is industry practice. Is that correct?

MR. SHIPLEY: Yes.

MR. FAULKENBERRY: The question was: what is the error rate in the large bore pipe?

MR. TRESLER: I don't think that we have any figures on that. We haven't performed any reviews. Maybe the IDVP could speak to that.

UNIDENTIFIED VOICE: Could you repeat the substance of that?

MR. FAULKENBERRY: The question was, what was the error rate in the large bore piping, we have been discussing the error rate in the small bore piping -- 17 percent for detail -- requiring detailed calculation -- 78 percent minor calculations. Th-ey say that is only small bore, what is the large bore results.

MR. CLOUD: You are asking then, what is the error rate in the DCP in the calculation of the large bore pipe?

We -- I will say the follwoing: we verefied and in exhaustive detail, the problems in our sample, that is to say that we checked every number and we checked every model. We noted all of the discrepancies that were of any significance in IDR.

I think that it is also true that we did not note all the discrepancies, because there were a number that were passed off immediately as being insignificant. However, we did not calculate a percentage rate of error.

In the first place, we didn't say that -- well, I would say this: that we never thought to do it, nobody ask us to do it and it is not clear to me what the benefit of know such a number would be.

Also, I might add, that even more to the point, I

believe that it is extremely difficult to establish what a percentage rate of error is, because the way to calculate that would be to take the number of errors, divide it by the number of calculations or decisions or inputs and multiply it by one hundred.

Gentlemen, I believe that the denominator in that faction would be extremely difficult to determine. But, in any event, we didn't formally calculate an error rate.

MR. TAYLOR: I think that this error rate is based on numbers of packages, just of packages that had to go back for re-calculation, is that right?

I think one or two other questions ---

MR. KNIGHT: Since it follows directly on that ---

MR. CLOUD: I think that I answered the wrong question if that was the case.

MR. KNIGHT: A little trouble with timing. Your sample was taken when? Give me a calendar time.

MR. CLOUD: We did -- in this -- in our program on the piping, we did, of course, the phase one program and then second, the phase two. The phase two was the review of the corrective action, or the review of the work done by the DCP which, in fact, we are discussing today.

MR. KNIGHT: Okay, when you say sample, I just wanted to be sure that we were not going back to the initial thing, for example.

MR. CLOUD: I think for present purposes it is better to confine the discussion to the later samples, as reported in IPR, I believe fifty nine? Fifty nine is large bore piping. And then -- the second question was -- the reinterpretation of the question, I guess is a better way to characterize it -- if you say -- if you ask the question: how many calculation packages were found to be inadequate, well then, that is quite a different question.

And, I believe that in our sample, of the BCP corrective action, that we found none of the calculation packages that we verefied, in the corrective action program contained errors that required an physical modifications.

MR. TAYLOR: I wanted to ask a couple of questions about that 17 percent. Did you look at that hard enough to know that that was the work of only one or two engineers, or three engineers? Have you analyzed it to -- the fact that hardware changes were not required as a result of this, I presume that you would still desire not to have to go through calculational packages and rerun them, based upon errors.

I presume that your object is to not do that. Then, what is the reflection -- is that restrained to several individuals, is that a matter of training, is it widespread throughout the group that errors are being made, or have you tried to characterize the group of engineers working on it.

MR. SHIPLEY: We did indeed look at the calculations

stemming from the 17 percent, or vice versa. And, we could not find a single individual or procedure -- I might add a couple of comments that were just developed, in general, from the conversations -- the questions and answers that have happened here.

I wonder if we are not getting confused about the judgement that Mr. Manoli is referring to, and where the judgement comes in. What I was trying to say is that the judgement comes in in the amount of rigor or the amount of intensity or detail that an individual gives to the checking process, the screening process -- how fine the screen is -- before he is going to say: that is acceptable.

That is where the judgement comes in. Not, in the fact that when a person picks up a pipe support, he says: Gee, based on my five years of experience, that is obviously okay, I don't have to look into it. We are not talking about that kind of judgement.

We are talking about a review -- we are talking a checking function that is a detailed review. The question is: how detailed is detailed. That is where the judgement comes in. I wanted to be sure that we were not getting that confused.

MR. TRESLER: I have one thing to add. I think when we talk about these error rates -- to use that term -- we gotta remember that the only area of small bore that is

even being considered to be abnormal, is in the area of the STRUDL analysis performed on the complex piping frames.

And, if there is a commonality, that is it -- STRUDL. There are some things that exist up in the main office -- in the consultants main offices, that gives us a greater confindence in the work done in large bore. In the case of the large bore piping, not everybody was allowed to perform STRUDL analysis. The main office, consulting organizations were available and involved constantly.

It is, I guess, a potential that those two items lead to more deviations between the "as-built" and the STRUDL model.

But, I think that we can't forget about the bottom line of, in all cases the supports were shown to be qualified as designed, and maybe we can use more engineering judgement in the modeling than others believe is necessary. That was not the case in large bore.

So, STRUDL, I guess is your answer.

MR. SOFFELL: You mentioned that the sample size used was 129 our of 400 total. And what that 400 represents is the small bore supports for which a STRUDL analysis was performed?

MR. SHIPLEY: that is correct.

MR. TRESLER: We committed to the NRC to review all of those STRUDL analysis, and that is in the process now.

The way that I understand it, our sample is up to something on the order of 160 and the conclusion is not changes.

MR. SOFFELL: We are not even addressing all of the small bore hangar supports that were simple enough --

MR. TRESLER: That is right. That were either simple and done by hand calculation or generic analysis of support detail.

MR. SHIPLEY: I would like to add one other point. The 17 percent that we seem to be dwelling on, is a -- let us say, for example, that the checker would have caught these 17 percent that were deemed during this last review to need reanalysis.

And, at the time when the original checking was done, if that was told to the originator and the reanalysis had taken place, the result would have been the same. So, again, we are talking about the process and the normal process of engineering. One of the supports of the 17 percent may have gone through that process several times. The originator did the calculations and gave it to a checker; the checker said no, I don't agree with that, do it again.

The originator did it again, he gave it to the checker and he says: no, I still don't agree with it, do it again. Okay? And now we are talking about later -- we did a finer review, a more detailed review and another checker came to the same conclusion and gives it back to the

originator and says do it again.

And the result still comes out the same. The support looks exactly the same as it did the first time that the originator did a calculation on it.

I am trying to say that it is just like part of the calculational process, by which checker and originator eventually finalize the calculation -- finalize the support.

MR. NORTON: I think that there is one thing that hasn't been presented, also, in terms of the numbers.

I think that the facts are all there, but they haven't been put together.

Mr. Shipley, I believe, stated earlier that there were approximately 25 of that 110 that were selected because it was alleged that there were problems with those. In other words, they were not -- if you will -- just a grab bag sample. They were picked because it was believed that they were wrong. And, I suspect that once you finish the 400, the percentage may indeed drop considerably from 17 percent.

It may not, but it seems very likely that that will occur, if indeed that original sample was skewed to pick the bad ones, if you will. And so, I don't think that one should loose site of that. Unfortunately we aren't done yet, so we can't tell you that.

MR. ALLISON: Why -- your are talking about a total sample of 400 and some small bore pipe hangars, -- that had

a STRUDL analysis. Why are they different from the other small bore pipe hangars in the plant?

MR. TRESLER: I think that it is simply a degree of complexity. The more complex structures can't be handled with a simplified analysis and had to have a STRUDL analysis.

MR. ALLISON: And the others would number in the thousands, right?

MR. TRESLER: That is correct.

MR. ALLISON: And they would be designed by thumb rules?

MR. TRESLER: Or hand calculations, or standard calculations that are applied by detail.

MR. SHIPLEY: For example, a simple cantilevered beam, a cantilevered angle off of a base plate with one pipe support on it. If the pipe is a certain size, then there are certain perameter and you put it up and it was qualified by a conservative standard calculation previously. That is another method of doing it and there are many like that.

MR. VOLLMER: Move forward?

MR. KAHLER: Yes.

MR. VOLLMER: Good.

MR. KAHLER: This is Ed Kahler. I am addressing criteria 5(t), item two.

The observation, as taken from transcript page 48 is personnel training was not requested by supervisors in a timely manner.

Our procedures ascribe this activity to the supervisor of the personnel. And assisting the supervisor in this activity, we have -- had set up an automatic request type situation, in that the supervisor, at the time he requires project administration of a new employee, the project administration group, in turn, notifies the project quality engineer who, in turn, notifies the PGandE training coordinator to schedule the training for the employee.

Again, the personnel training we're talking about here is the same as described in my discussion of criteria to item one. And as noted there, the training was not directed to achieving technical proficiency. Again, I must emphasize the proficiency is achieved through education, prior experience, on-the-job training.

We feel that while the supervisors may not have satisfactorily checked the completion of this personnel training, and probably due to relying on the automated

system we had in process, we do not feel that this supports the implication that the errors in calculation and the failures of checkers to identify errors is attributable to the delinquency or the absence of this training.

We address the significance of this observation in our -- again, our February 7th submittal to the NRC. While some individuals did not receive indoctrination and procedure training required within the 30 day specified period, the records indicate that the discrepancies in calculations that have been observed are not related to either indoctrination or training or professional experience, but are, rather, more of a random nature.

Consequently, the delayed completion of the training for the design support engineers does not appear to relate to the discrepancies detected.

MR. VOLLMER: Okay.

I think we talked enough about training and corrective measures this morning. Why don't we move forward?

MR. KAHLER: One item --

MR. VOLLMER: I assume there's no questions after that.

MR. KAHLER: One item I would like to add is that numerous audits have been performed by the Bechtel Power Corporation management audit team, the independent verification program, both PGandE quality assurance

organization and the project quality assurance organization have performed numerous audits in the training area. None of these audits have concluded that delays in training have any generic implications to the quality program.

MR. NORTON: I think the next one we're going to define, 5(b)(3) and 3-3, is that correct?

MR. SHIPLEY: And, in fact, I believe the logical place to start is at 3-3.

The subject here is whether or not the design control program contains the procedural requirement for the confirmation of design information transmitted by telephone.

A review of the engineering manual's procedure 621, Section 4.4, reveals that there is a specific requirement that any verbally transmitted information must be followed up in writing. Until such time, the calculation must be labeled as preliminary. There is a specific provision for requiring that calculation to be preliminary until confirmation -- until it is confirmed.

In terms of -- of did we follow that procedure, that is the substance of criterian 5(b), item three, and there was one issue, and it has to do with calculation for support 2156-200, that noted that loads were received by telephone.

The calculation, prior to confirmation of that, the calculation was not marked as preliminary, in violation

of the procedure. This, however, is an isolated case. We have reviewed other -- other hangers that were -- where loads were transmitted by telephone, and each one of them were marked preliminary at the time the load was received.

The -- this occurred -- this was not the normal process for obtaining loads at the job site. The normal process was through documented channels. So, we have one case where we failed to comply with the procedure, and I guess we feel that because it is only one case, that that does not constitute a generic concern, certainly.

MR. FAULKENBERRY: Just a quick question.

In that particular case, was that eventually clarified in writing?

MR. SHIPLEY: Yes, it was.

MR. FAULKENBERRY: Okay.

MR. VOLLMER: How much did you look at to confirm the statement that you just made, that this was an isolated case? What did you actually look at?

MR. SHIPLEY: Let me check that.

There was one period in time when -- when, in order to expedite the finalization of calculations in OPEG, the loads from San Francisco, in a few cases, were transmitted. This was over a very short period of time, and this hanger took place during this period of time.

I'm afraid we're not going to be able to tell you

exactly how many supports.

I think there's two issues here. Again, we're talking about the process.

MR. VOLLMER: Yes.

MR. SHIPLEY: Clearly, it was followed up in writing in all cases, and we're talking about the fact that, at one point in time, we had -- we neglected to follow the procedure and call it preliminary. But it was, indeed, finalized with the written documentation.

MR. VOLLMER: What you're saying, in all cases that you've checked, the written documentation came through to verify or to support the telephone conversation, but not all cases, or at least this one -- the calculation was not marked preliminary?

MR. SHIPLEY: That's in the interim.

MR. VOLLMER: In the interim.

MR. SHIPLEY: That's correct.

MR. TRESLER: Mike Tresler.

I might add, that one case that we're talking about was a four pound load, and that may have led that individual to treating it as he did.

MR. SOFFELL: Did I understand you to say that this is not a -- let me phrase it another way -- this procedure was only in place for a short period of time? In other words, it wasn't a normal process before this period

of time, it then existed for some period of time, and now, currently, today, it's not a normal process?

MR. SHIPLEY: I'm not talking about the procedure that requires verbal information to be verified in writing. That procedure has been in existence and remains in existence.

MR. SOFFELL: Okay.

I was talking about the other one; the one where your normally -- okay, where you verbally transmit, orally transmit loads and marked the calculation preliminary. I'm not talking so much about the follow-up -- well, I guess any of that procedure.

Is it in place? Is that a normal process? I thought I heard you say something that led me to believe that that only occurred for a short period of time.

MR. TRESLER: Let me answer that question.

The procedure to employees to provide all the information to the small-bore organization in written format, either by transmittal of analysis, or however it needs to be done. There was a very short period of time where the vehicle of phone calls were used in lieu of the normal process, and that normal process continued, which means that phone calls were used for a very short period of time, and then followed up with the written transmittal information.

There are procedures in place for using

information deemed over the phone, but that really wasn't done.

We set up a program and procedures which, for the most part -- which, in all cases, required the use of the written information. I don't know -- a month or so, the work was expedited by use of the phone call, and the intent was that those calculations would not be finalized until the written information came through.

MR. VOLLMER: Okay.

Go ahead.

MR. SHIPLEY: 3-1, I guess is next.

MR. VOLLMER: Just in the interest of having an incentive, we'll take a break after at the end of three.

MR. SHIPLEY: This observation was one that was quoted as, there was inadequate design control to prevent the design criteria conflicts in the design of the pipe restraint structural frequencies.

And the -- the -- the essence of this appears to be some concern relative to pipe supports being designed to have a natural frequency of 20 hertz and greater, and the -- the -- the Hosgri seizmic analysis to be carried out to 33 hertz or greater. And the -- this does not constitute an internal design criteria conflict, because it is in complete accordance with the FSAR commitments.

The FSAR, when -- when the Hosgri amendment was

filed, it contained a statement that said that -- this is not a quote -- that the pipe supports may be assumed rigid in the stress analysis if there is a natural frequency of 20 hertz or greater, but where procedures require or allow, and that is precisely what we do.

We recognize that -- that -- that through -- through time, some apparent differences in criteria can exist, but this, clearly, is not a design concept. It's a requirement of the FSAR. The procedures merely implement that requirement, and we follow the procedures.

MR. KNIGHT: Let's see.

Wasn't -- well, are there, in fact, procedures being employed, or were there procedures being employed by engineers who would have used the deflection criterion that would be the equivelant of some different response frequency?

MR. NORTON: For what purpose?

MR. KNIGHT: For design.

MR. NORTON: For analysis or supports?

MR. KNIGHT: For analysis, in particular, for supports.

MR. SHIPLEY: Jim, I'm not 100 percent sure I understand your question. Let me try, and you can ask it again.

We -- we have used deflection criteria in order

to establish the -- in order to be sure that the pipe support is, indeed -- has the natural frequency about 20 hertz. The deflection criteria has been developed through the 20 hertz requirement.

Was that the root of your question?

MR. KNIGHT: You're saying that -- you're stating that, to the best of your knowledge, there was only one single deflection criterion in force, in use?

MR. SHIPLEY: Well, clearly, the deflection criteria in use is clearly a lower bounds, a 33 -- a 20 hertz criteria. Anything greater than 20 hertz would be acceptable by -- by inspection, because what we're trying to do is assure rigidity. SO --

MR. KNIGHT: In ITR number 60, for instance, the ITR identified application of a -- of a five-eights .0625 inch deflection criterion, and I had understood that the deflection criterion that was enforced was different than that; was like a quarter of an inch -- less than that, it was .025.

MR. SHIPLEY: That was -- this is evidence of a -- the person merely made an error in the selection of the -- not the selection. In comparing the deflection evaluation support to that allowable. It should have been .025, and we looked at -- we went back, and the person who had made this mistake, we went back and looked at his work and we

found that this was an isolated case.

He just looked at -- he compared it to a different allowable.

MR. KNIGHT: Okay.

So, for the record, .025 was the criterion?

MR. SHIPLEY: Yes, sir.

MR. KNIGHT: And it was the only criterion that was employed?

MR. SHIPLEY: Yes.

MR. KNIGHT: As far as -- we're talking about deflection criterion for determining rigidity.

MR. SHIPLEY: Yes.

MR. NORTON: Can I ask for -- I listened to Larry and I'm not sure that what he summarized was as clear as the draft written answer we have here, but Larry, as I understand it, 20 hertz is used as criteria for supports, and the 33 hertz was used for small-bore stress analysis, and they weren't interchangeably used for either stress analysis or supports, but were each used, one in supports and one in stress analysis.

Is that the bottom line of what you're saying?

MR. SHIPLEY: No, not exactly.

The -- the issue of the 33 hertz is -- is really a function of the response spectra that the civil discipline generates, and that response spectra is -- is evaluated out to 33 hertz.

Okay, there is no such allowable for pipe stress analysis, per se, which we analyze it ultimately out to 33 hertz.

MR. NORTON: For the Hosgri.

MR. SHIPLEY: For the Hosgri, yes.

MR. MANOLI: This is Kamal Manoli here.

I have a question on the approach for computing the frequency from the deflection.

I understand you use the dead-load approach as the means of computing the frequency?

BY MR. SHIPLEY: By dead-load, I think --

MR. MANOLI: Well, just applied uniform loads and computed deflection from that, and then developed the frequency from that kind of --

MR. SHIPLEY: Yes.

MR. MANOLI: Is that true in supports, too?

MR. SHIPLEY: Yes.

MR. MANOLI: I think you realize it would not give you the frequency, it will not.

MR. SHIPLEY: In certain instances it may not, but it -- we believe, for the purposes of what we're talking about, it provides a satisfactory number. In other words, if a support is -- is -- is 20 hertz -- if one support in an entire piping analysis for an entire piping system, we miss it slightly, such that it's 19 and a half hertz --

MR. MANOLI: No, I'm not talking about that kind of closeness. I'm talking about larger differences.

MR. SHIPLEY: But even perhaps larger differences, 15 hertz rather than 20 hertz. One support in a piping system, I think there's been many studies done that demonstrate that that does not change the overall response or loads in the system or stress or almost anything. It stays esentially the same because the rest of the supports are, in many cases, much higher than 20 hertz.

MR. MANOLI: Yeah, but I'm just saying there are instances where it's not intuitively obvious that the dead-load will give you the first mode, and then you will be ready to contend the frequency in third, fourths, fifths, you don't really know which.

For a simple case, a simple overhanging --

MR. SHIPLEY: Yes, that --

MR. MANOLI: You know, you're not going to get the first mode.

MR. SHIPLEY: Clearly that's the case.

MR. MANOLI: And some people think that's a simple support, but it doesn't add up to the conclusion that we're talking about.

So, there are situations where it's hard to judge, and some of your supports are rather --

MR. SHIPLEY: Mr. Manoli, the only thing that we

could point out is that, you know, there are -- there are -- we don't need to go into this today, but there are other methods -- there are other items of conservatism that we use in the calculations, such as the tributary masses all acting in the same direction instead of in other directions for -- if you have a pipe support supporting more than one pipe, and this type of thing.

The 20 hertz is -- is -- is only a criteria. It clearly doesn't set a pass/fail situation for the support --

MR. MANOLI: I understand.

MR. SHIPLEY: -- and I think we recognize those things, and feel, still, that it gives an adequate representation of the pipe support frequency, and so we used it, as the rest of the industry, in general.

MR. MANOLI: Okay.

MR. SULLIVAN: I hate to hold this process up any longer, but I'm still a little confused about the whole thing.

Are you saying that what you normally use is -- when you use the deflection criteria, is the 25-thousandths?

MR. SHIPLEY: Yes.

MR. SULLIVAN: I see a nodding of yes.

The one-sixteenth of an inch that's come into this discussion, where did that come from, in your mind? According to this, it's used -- it came up in some sort of a Bechtel document.

MR. SHIPLEY: In the -- in our -- in the Bechtel standard pipe support manual, there is an additional requirement for a one-sixteenth of an inch deflection.

MR. SULLIVAN: Is that related to frequency?

MR. SHIPLEY: No, it's not. It is an additional requirement. The individual who was -- who was doing this calculation, inadvertently picked up the one-sixteenth of an inch.

MR. SULLIVAN: And used that for --

MR. SHIPLEY: For the stiffness, and --

MR. SULLIVAN: Okay.

MR. SHIPLEY: -- as I say, we looked at other of his calculations, and this was the case where he did that.

MR. SULLIVAN: And you viewed enough that you're confident that that's the only place that --

MR. SHIPLEY: Yes, we are.

MR. SULLIVAN: -- it exists.

Thank you.

MR. VOLLMER: Let's move ahead.

MR. NORTON: Okay.

Next is a combination, I think, of three, 3-4, 3-5, 3-6, all dealing with that snubber support, rigid, and so on.

We were asked to present all three of those. This is going to be, I suspect, a fairly lengthy one. Do

you want to take a break before or after?

MR. VOLLMER: Let's move ahead. It might keep it from being too late.

MR. SHIPLEY: The observation is that there was no design consideration for synchronizing loading between closely spaced rigid restraints and rigid restraint to anchors.

A second observation was snubbers were inoperable due to placing them in close proximity with rigid restraints and anchors.

We believe that -- that part of this is a concern that -- that there was no design consideration given to the potential over-stressing effects that this can have on the piping system components, and in reality, all the restraints and -- and the restraints being rigids and snubbers -- have been modeled into the computer analysis.

Perhaps I should go back a moment, just to get us on the right track.

This whole issue will be directord the piping stress analysis, rather than the pipe support design and calculation, which we've basically been talking about the rest of the time.

All of these -- these pipe supports; that is, rigids and snubbers, that we're going to refer to in this next discussion, have been considered and modeled into the

piping analysis.

We -- in response to some concerns and some discussions with the NRC staff, we have gone back and taken a 100 percent review of all -- let's call it in proximity restraints -- and they would be defined as snubbers adjacent to rigids, snubbers adjacent to anchors, and rigids adjacent to anchors.

The results of this study was reported, again, in the -- on pages 16 to 20 of the February 7th submittal, and perhaps I could just, without getting into detail, at least of the beginning, explain what was done and give a brief presentation of the results, and if it warrants going further, I certainly can.

We looked at all of the large-bore piping for these proximity restraints, and we identified -- first we developed a criteria. The criteria was anytime one of these restraints was within five feet of the other restraint -- we actually used a 3(d) criteria and a 5(d) criteria.

The breakdown was like this. Out of all the snubbers in the plant, within 3(d) of a rigid, there were 25 snubbers. Within 5(d) of a rigid, there were 37 snubbers. Within 3(d) of an anchor, there were snubbers adjacent to anchors -- there were two within 5(d) of an anchor, there were six.

With regard to rigids adjacent to anchors, within

the 3(d) criteria, there were 25; within the 5(d) criteria there were 37.

We, then, looked at, from the snubber point of view, would there be -- we ran a calculation without the snubber. We removed the snubber from the computer model, and we ran the calculation without it, and we determined what the movement would be at the location where the snubber was.

If that movement was great enough to -- the dynamic movement, due to the earthquake, if that movement were great enough to lock the snubber -- in other words, make the snubber function as a rigid restraint -- then, clearly, that snubber was operable and should remain.

On the other hand, if the snubber was insufficient to -- if the snubber movement at that location was insufficient to cause the snubber to function, we looked at the results of the analysis without the snubber; what were the stresses, what were the other support loads, the redistributed support loads. We did the same thing with snubbers next to anchors and rigids next to anchors.

The result of that was there were -- there were 13 snubbers that would not actuate -- the movement levels at the location of the snubber were not sufficient to actuate the snubber. And those 13 did not cause an over-stress in the system, and when the supports in the system were looked

at from a redistribution of load point of view, the pipe supports were also adequate.

I don't want to get into this in too much detail, because Mr. Tresler is going to deal with it in depth, but this, of course, means that those 13 snubbers could be removed from the plant without causing problems with the stress analysis or the pipe support qualification, and that is after a review of all snubbers in the plant.

MR. NORTON: Larry, could you say where those 13 snubbers are -- maybe not all of them, but the best you can?

MR. SHIPLEY: They are located primarily in the auxilary building.

There was one other issue of -- and that was rigids next to rigids, and we have not yet done that review, and we believe, however, that since snubbers next to rigids have a -- the distance needed to actuate a snubber is much smaller, and since when we take those -- when the movement is smaller and we run those calculations again, we don't have -- we don't find a problem with the -- with the pipe stress or with the loads on the restraints, and we feel that if we did, a -- a rigid restraint next to rigid restraint calculation or review, the results would be much the same as this.

There would be several rigids that -- that -- that would not necessarily come into play. However, the pipe

stress and the loads on the adjacent supports would be acceptable.

MR. KNIGHT: Can you offer me some rationale on why the restraints were -- the two adjacent rigid restraints were there, if one can go away and the other one is -- still -- the system is still acceptable?

MR. SHIPLEY: Yes.

This, as Mr. Friend explained earlier in the day, this was -- this was a reverification effort, and during the reverification effort, there were many things that -- that changed and were added. Anchors were added to the system in places that would divide the system into smaller systems that could be handled more easily analytically.

There may have been a rigid restraint, for example, located at a -- located somewhere in the system near where the logical place for an anchor would be. The anchor was added there, the system was broken into -- or was divided for analytical purposes into two systems, and now we had a rigid restraint that was very close to this anchor, because it pre-existed -- predated the installation of the anchor.

We might have a case where we -- we needed to put a rigid restraint or a snubber near a valve to restrain the mass of the valve, and the top of the valve. And there might be another restraint only a short distance away, but it was not sufficiently close to cut down the acceleration

that gives input to the top parts, and therefore, it would not meet the acceleration criteria, and so we had to add another support reasonably close to the other one, but for a different reason.

MR. KNIGHT: Okay.

Basically you were saying that the new -- the new support that was put in there would be sufficient to do the whole job, but there's no need to go back and remove the old one, is that --

MR. SHIPLEY: In many cases, that's true.

MR. KNIGHT: This type of thing.

MR. TRESLER: Okay.

I'll address Criterion three, observation, item number six.

This observation is identified as being a lack of considerations associated with the use of snubbers, and I'll try and be brief.

First off, it's true that the program that we used during our design verification process did not include consideration over snubber reduction. The charge of the design verification program was simply to show that the piping and pipe supports met with the licensing criteria, and where we were unable to show compliance, we issued modifications to meet criteria.

Certainly, during this process, seismic limiters

or snubbers, were never added unless they were required by analysis. The reason for that is the snubbers are more expensive to purchase and install; availability is oftentimes a problem; we had to, at times, take snubbers from unit two and put them in one, because we can't get delivery.

In addition, we're certainly aware -- certainly aware of the need to perform testing and maintenance and include these snubbers as a part of the ISI program, so never have we added snubbers unless it was absolutely necessary to comply with the piping analysis.

A lot was addressed to a degree, though, as a part of the pipe support design program, in that all of the snubbers that were designed were coordinated with the operating organization to assure that they didn't impede excess to those welds that had to be inspected as a part of ISI, and also, of course, that the snubbers, themselves, were accessible for inspection.

The fact that they're easily removed and accessible also leads us to believe that when we do accomplish the snubber reduction program, it's not going to be significant if we're in operation, as far as a lot of considerations.

Right now, the nuclear industry has, in development, a number of special snubber authorization computer programs. I understand that increased damping and reduced deflector broadening is being considered, and also increased allowables,

and Bechtel, as a matter of fact, is very close to presenting a position on use of energy absorbers malleable reductible steel, in lieu of snubbers.

What we'd like to do is to let these programs, which are coming to conclusion very quickly, come to conclusion so that we can fashion the most effective snubber reduction possible, to meet our needs.

We did commit to a snubber reduction program, by letter, to the NRC, and that letter is dated February 15, 1984.

In that letter, we identified a schedule which said that all work would be done by the end of the second refueling, and it's certainly our intent that the majority of the snubbers would be removed during the first review.

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MR. VOLLMER: Are there any questions?

MR. BOSNAK: This is the 13 that you talk about, are these the numbers that you're saying would be removed by the second refueling?

MR. TRESLER: Absolutely not.

MR. BOSNAK: Are there additional ones or what are we talking about?

MR. TRESLER: We would expect that when we enter into a snubber reduction program that we will find that we can remove substantially more than 13 snubbers. The 13 snubbers that Mr. Shipley referred to are those that are already known to allow the pipe and other supports to still meet requirements and we could remove them. One of the reasons that we haven't done that is that it requires a tech spec change and that takes time and so we've chosen to leave those 13 in place because the piping is certainly qualified with them in place and to remove them as a part of the greater snubber reduction program.

MR. BOSNAK: Do you have any idea how many snubbers we might be talking about?

MR. TRESLER: We've talked about it and we'd estimate 200, 300, somewhere in there. I might point out that the number of snubbers we have at Diablo Canyon are not that much different from other plants which have already gone through a snubber reduction program. We've got 1450

snubbers, approximately and I understand LaSalle which has completed its number reduction program has something on the order of 1400 so we don't feel it's a significant issue.

MR. VOLLMER: Questions? Shall we finish item 3 now.

MR. SHIPLEY: An issue here is whether a specific written procedure to define the interface between OPEG, stress and pipe support group or the lack of that procedure or whether it would require it.

We believe the concerns step from the fact that there are certain procedures required to govern the interface between disciplines and clearly the Diablo project has those interfaces in place.

The OPEG stress and pipe support group, however, are within the same discipline. They belong to the piping discipline and as such they function as sub-groups underneath the piping discipline. They work together much as two engineers within a civil discipline would work together and as such, there is no requirement to have a formal interface procedure between these two sub-groups of a discipline. However, we recognize that there needs to be some kind of orderly flow of data from one group another, even though it's in the same discipline and as such, pipe procedure P-11 section 4.1.8 states that the

lead piping stress analyst or his designee is responsible for providing the pipe support review supervisor with pipe support loads or piping movements. The method chosen to do that in OPEG is with a transmittal form that incorporates a return receipt requirement and so, the stress group, when they analyze the piping system, develop hanger guidance from that piping analysis, they provide it to the pipe support group with, on this form letter and the pipe support group returns acknowledgement of receipt of that loads, so we believe that there is a procedure even though it's not required and even though it is somewhat informal buc it is in place.

MR. TAYLOR: Is it used?

MR. SHIPLEY: Yes.

MR. TAYLOR: It's geen there all along?

MR. SHIPLEY: Yes, sir.

MR. BOSNAK: Larry, I think I was getting into this this morning when we spoke about this particular item, but who has the overall responsibility, in looking at the two groups? You characterize one as a pipe stress group and the other as a support group, but who controls the entity which is the piping system?

MR. SHIPLEY: Today is somewhat different than it was during the majority of the corrective action program. So let me speak to the corrective action program portion.

The pipe and support group leaders both reported to the assistant on-site engineering, project engineer. And, it was on that point that the supervisors of the two groups came under one supervisor.

MR. BOSNAK: So he was the person who had to make a decision if you have a non-conformance, some of the things we've been talking about? Where does that responsibility lie in that procedure?

MR. OMAN: The responsibility in the project procedures for identifying potential problems as descrepancy reports or non-conformist reports lies procedurally with any engineer on the project who identifies what he believes to be a potential problem. That is identified to his supervisor. If it were an engineer within the pipe support group, it would be identified to the pipe support group leader. If it were an engineer in the stress group --

MR. BOSNAK: I was getting at the resolution of, the discrepancy that you had between the two groups.

MR. OMAN: Are you addressing how we solve this problem when we reroute the pipe or change the pipe support, kind of an interface problem?

MR. BOSNAK: I'm looking for -- in your procedures, who has the final control between the two groups and how is a resolution affected?

MR. TRESLER: I think the process takes care of

that. I think what we're talking about generally is with the piping analysis that's performed and that generates loads for the supports and that analysis is transmitted to the support group. They then provide designs compatible with that analysis. If they find they're unable to do it, they return the analysis back to the stress group, work with them to come up with the configuration that can be met in the support design effort in the analysis reissued and the process is completed.

MR. FRIEND: Let me try, Bob, if I may. I believe that the way that you characterized it, the pipe stress analysis group has the final say and control. They, through their analysis show that the pipe does or does not meet the total response and as a result of their analysis gives the support load to the support engineers. If the support engineers are unable to arrange supports in accordance with those requirements, they cannot walk away. They must go back to the stress group and work with them to rearrange support or whatever to keep the stresses of the pipe within the allowables.

So, it seems to me that where there are -- and these are cooperative efforts, not adversary efforts. It seems to me though, that in the final analysis, the piping stress group who must maintain the piping within code allowables has the final decision making process.

MR. BOSNAK: As long as they have the competency to do that, we've seen in other situations where the pipe stress group would become stress analysts and they really don't have the capability to understand what needs to be done with the supports to make an acceptable system. So, what you're saying is, that you have within the pipe stress group, individuals that can do that. That's what I'm hearing.

MR. FRIEND: Why don't you comment on the quality of that?

MR. SHIPLEY: Yes, I believe that's right, Bob. They are capable of doing that but further, as Howard said, the -- it's the piping stress analysis and the outcome of it that governs and pushes the pipe support designers and in the case of a reverification program, it is ultimately, if the current configuration, if the pipe support group keeps coming back and saying gee, we can't make the loads you've given us, the pipe support won't work, it's still ultimately the piping stress analysis, that the analyst, he will have to at some point in time say this is as good as I can do. These are the loads. You must redesign the support.

MR. BOSNAK: Did I understand that you have a new process, a new procedure now? You indicated earlier that you had one procedure that worked earlier and now you

have something else.

MR. SHIPLEY: It's not a procedure, it's somewhat of a new organization.

MR. BOSNAK: What is that now?

MR. SHIPLEY: A group supervisor down there at OPEG. Down there meaning within the OPEG organization who is another level inbetween the pipe support, pipe stress group leaders and the assistant on-site project engineer. This person really is performing the same function as the on-site -- assistant on-site project engineer during the other part. It just felt that we needed an additional layer in there to divest some of the -- to delegate some of the responsibility that the assistant had.

MR. BOSNAK: And this is the person that in the old organization that took his place that eventually gets all DPs, NCRs and field design requests. He's cognizant of all of them.

MR. OMAN: That's true. Under the old organization, just to make it clear, the old organization, the pipe support group and the pipe stress group in the organization reached a common person, a common position with the assistant on-site project engineer.

Recently, to strengthen that organization that Larry has outlined, we have established another person below the assistant project engineer, a very experienced

engineer in that position who is now the supervisor of the pipe support group and the pipe stress group and he is the person in charge of the activity of both of those groups and it is to his level ultimately that problems come that can't be resolved below his level and give resolution.

MR. VOLLMER: No further questions? A fifteen minute recess. Off the record.

(Whereupon, a fifteen minute recess was taken.)

MR. VOLLMER: On the record.

Okay, Criterion 18?

MR. DiURIARTE: I have Criterion 18, item 1. My name is Tom DiUriarte. The observation here from the transcript on page 65 is when a QA audit item could not be evaluated due to a lack of project activity, follow-up of the item was not planned and PG&E QA audit 83087(a) was specifically identified as the example.

The thing that's necessary in responding to this accusation to point out the types of audits that we do of PG&E in the QA Department. We do two types of audits. One is called "program audit" which is scheduled and conducted to provide coverage of all programatic elements of the PG&E QA program to verify implementation as required by the regulatory guides.

Secondly, we do audits that are called activity

audits. These are supplementary audits which are very informal and narrow in scope and they provide additional monitoring of activities.

When you compare them to the program audits, they almost seem like an afterthought. A program audit might take anywhere from two weeks to a month to prepare for and for and conduct. An activity audit can take as short a time as one morning.

The audit in question is an activity audit performed in the field to verify that certain methods were provided for control in construction related deviations. There is no regulatory requirement for PG&E to conduct audits such as activity audits. One of the areas planned to be audited has been audit 83087(a). The auditor verified that procedures were provided for controlling the activity but the auditor could not verify implementation of the procedures because the activity had not yet been performed. This is not a frequent occurrence but it happens occasionally.

Activity audits in the field are scheduled to cover the activities that are taking place based on the construction schedule that's issued at the beginning of the week. There are many factors that caused that schedule to be changed on a daily basis. Many activity audits that are scheduled in the field are sometimes never

performed because the activity gets scheduled or postponed for a month. Something of higher priority comes up that a supervisor in the field schedules the people to audit instead. For this audit and other activity audits, there has not been a formal attempt to reschedule areas that those audits that are not performed due to a lack of activity.

The QA supervisor responsible for the assignment determines the need for rescheduling. When I was the supervisor of auditing, I had the audit schedule tacked on my wall. That was the official schedule. When an activity audit was performed and portions of it were not completed, if I wanted that portion completed, I would mark up the schedule with a reschedule date and the person in charge of issueing the next schedule would come in there on a weekly basis and take all my mark-ups and go run an update on the computer.

Generally, unless an activity audit was scheduled for a specific purpose related to a program audit, for example, if someone did a program audit and had a finding that appeared to require a closer look in some depth, in some specific area, an activity audit would be scheduled in that area. Now, if that activity audit was never completed, it would be rescheduled because it was tied to the program audit which is required coverage of a program element.

But if an activity audit is scheduled purely because you've got a gap in someone's audit schedule and you've got the manpower available to take another look in another area, that one if it's not completed, may not be rescheduled but it isn't a required audit.

MR. NORTON: Tom, could you also -- excuse me. Could you also do Criterion 18(3) which is PG&E audit materials, then, Mr. Jacobson could then --

MR. DiURIARTE: Okay, Criterion 18, item 3, the observation is from page 68 of the transcript. Lack of QA documentation of materials reviewed during the course of audit and it identifies specifically PG&E QA audit 83161(a) and that the audit conclusions were without basis and contrary to the NRC and subsequent Bechtel QA audit findings. Now, again, audit 83161(a) was an activity audit. It was scheduled to verify the adequacy of training documentation for three specific training sessions on engineering manual procedures.

The sessions audited were held on February 17 and 18 and March 14 of 1983. The records for the three specific training sessions that were audited were documented in the audit report. The audit concluded that the training is being performed and documented as required in the procedure. The audit report accurately documented the materials reviewed during the course of the audit. They in

no way represented nor was it intended to represent a comprehensive evaluation of the OPEG training program. The two audits that it is compared to, the NRC audit and the subsequent Bechtel QA audit, both had a larger more comprehensive scope for their audit plan. Any questions on those two particular items?

MR. VOLLMER: Did this particular audit meet the objectives of the audit plan? In otherwords, did the audit plan say that it was limited in scope?

MR. DiURIARTE: This particular audit plan identifies a very particular audit scope.

MR. VOLLMER: The first item -- could you define again what an activity audit is and if it's not important what role does it play in the overall process?

MR. DiURIARTE: Okay, the activity audits are designed to give us an additional lcok into certain areas as assigned by the supervisor. The QA program is required by the regulations and the industry standards to be audited in total every 24 months with some areas more frequent depending on the regulation. Those we do with what we call program audits which are very large, broad in scope and have a detailed check list. To supplement those with additional monitoring, we perform what we call activity audits which are generally conducted on a form which is printed on both sides of one sheet and simply by

filling in the blanks, the auditor has performed the audit.

MR. VOLLMER: Could you give me an example of what an activity audit might look like, very briefly? Not look like but what it might look into?

MR. DiURIARTE: Okay, well, for instance the training sessions referred to in item 3, the scope of the audit was to identify that those training sessions were being held in accordance with procedures being held in training. That, number one, they had been scheduled, that they kept track of who attended, that the records had been kept, that there was a lesson plan, those types of things.

MR. VOLLMER: But isn't that an audit of following the procedures? Why isn't that a program audit?

MR. DiURIARTE: A program audit would have looked at training for everything. We were looking at one specific group's training for a particular session which is just a very small piece of the training program. The training audit -- we've done several training audits and they generally take about a month to complete. There are so many different groups that provide training to some of the different people to cover.

MR. VOLLMER: What happens if you find in the activity audit there is a deficiency which is really programmatic, if there are deficiencies, then what happened?

MR. DiURIARTE: They are treated just like any other audit finding. They're evaluated, documented, evaluated and scheduled for completion as I explained before, depending on their significance. It's treated just like an audit. It's just that it is not required to be done to meet our audit commitments. Those are the program audits.

MR. TAYLOR: I'm having a little of the same type of struggle between program audit and activity audit. I take it that your program audits cover a great deal of the paper and the execution of it but they also presumably look at the conduct of the activity, is that right?

MR. DiURIARTE: The same limitation, right.

MR. TAYLOR: So if you do a training as a programmatic, you're also looking at the execution of the training, whatever that might happen to be going on the month of so you're doing that audit so I shouldn't distinguish that you're programmatical audits are just pure paper --

MR. DiURIARTE: No, that's correct. If we only did the program audits, we'd have a satisfactory program. We use the activity audits as a supplement to give us more information in a snapshot form.

MR. HEISHMAN: Can you tell me whether or not in your description of the program you describe the uses and how and when you're going to use these so-called,

not the program audit, the other one, the activity audit?

MR. DiURIARTE: Yes, sir. We do.

MR. HEISHMAN: Okay, then if that's the case, I guess I'm having difficulty accepting the concept that says there is no requirement to do those types of audits. In otherwords, when I look at appendix B, it doesn't say to me, PG&E, you must do "X" audits and "Y" audits but you don't have to do "C" audits or activity audits. You described somewhere in your program that says in order to meet appendix "B", we're going to do these kinds of things, one of which is program audits which you've defined, one of which is activity audits which you've defined to be of much lesser scope but still a part of a program that you're going to use in order to satisfy yourself that what's going on is being done. Now, what I'm gathering from your discussion is, you've said you're going to do them but that you didn't intend that to be something that says hey, I've got to do them or I want to do them or I'm going to do them, only that here is something that I may do and I don't know if I can accept that.

MR. DiURIARTE: Let me clarify something that you just said. In our procedures, we describe very explicitly what subject is going to be covered in the audit. If you look at Reg Guide 133 or Reg Guide 1.44 I think it is, it gives you the audit subjects, the audit

elements of your two year program and the frequencies that you have to cover certain subjects. We have a table that shows which audits have to be done in which areas and how often in a two year period. Those are the program audits and they're required to be done on those subjects at those frequencies.

Now, in a separate procedure, it says that we also do activity audits. There are no subjects specified. It's purely at the discretion of the supervisor based on the work going on or based on subjects that you had additional interest in.

Did that clarify that?

MR. TAYLOR: I think what Mr. Heishman's saying though, if you say you're going to do activity audits as part of your quality program, we expect you're going to do activity audits.

MR. DiURIARTE: Oh, we do them.

MR. TAYLOR: That's the point he's making.

MR. NORTON: I think --

MR. TAYLOR: And you have the option to change subject matter as you see fit.

MR. DiURIARTE: The point of the discussion is, we don't necessarily reschedule one that can't be done.

MR. TAYLOR: I understand.

MR. NORTON: But I think that the statement he made

that they're not required --

MR. TAYLOR: Yes, he said not regulatory.

MR. NORTON: Meant that if that wasn't part of the QA program, the QA program would still be acceptable. The fact that it is part of the QA program now makes it required which is now where I think you were coming from.

MR. HEISHMAN: I'm not hung up on whether or not it's a regulatory requirement. The point that I'm trying to make is that when I hear someone say that I'm going to do this in order to determine whether or not we're getting what it is that we're looking for, but it's not a requirement and then when it doesn't work out, in otherwords, when something happens that that doesn't get done, the response is, it's not required anyway then I automatically get a little uptight about the fact that here's something that we're going to do and we're proceeding to do it but we don't have to do it. We're just going to do it anyway and I guess I was getting a little flavor out of the response that said, the specific audits that we were talking about, the fact that we couldn't do them or they weren't completed, we had the option and I accept that, of deciding whether to redo them or not do them, but the answer to that question is not that they're not required, it's the fact that the requirement is, I have that judgement and I can go, do them or not do

them but I'm going to do something and that's the point that I was trying to get to the bottom of.

MR. ALLISON: I have one more question. If the same technical item, the ability to verify implementation of the construction procedure had happened to be part of a program audit, would you have had to reschedule it?

MR. DIURIARTE: Definitely.

MR. ALLISON: That's by your own philosophy and requirements? Once you set out to do a program audit?

MR. DIURIARTE: We haven't met it if we haven't completed the audit.

MR. ALLISON: What, you just say I don't need to do that procedure in order to complete the program audit?

MR. DIURIARTE: The program audit, say it's design control, the program audit for design control is going to be an audit of the design process. Now, if they are unable to verify design verification, they either have to broaden their samples to something where design verifications have been done or they're going to have to reschedule that part of the audit so they can verify that design verification has been done properly.

MR. ALLISON: We're talking apples and oranges. You wouldn't necessarily have to verify implementation, that specific procedure to do a program audit in construction practice or something, right, would you?

MR. DIURIARTE: Program audits are generally done with the subject of one of the 18 criteria. They don't generally get into specific work activities.

MR. ALLISON: I'm not getting through. Suppose you were doing a program audit or training and you sat down and you decided that I'm going to look at class "X". You go out to do it and class "X" was cancelled. What do you do about it then, in a program audit.

MR. DIURIARTE: Choose a different class.

MR. ALLISON: Would you be required to have class "X" and audit it and finish the program audit?

MR. DIURIARTE: No, not if there's enough data to meet your objectives. But in the situation of an activity audit, this specific assignment would be class "X".

MR. ALLISON: Okay, that's all.

MR. DIURIARTE: I think the parallel to what we do in many utilities is called surveillance or monitoring and we happen to call them activity audits. A lot of those activities, some of them don't even document those activities. We happen to document them and if we happen to have findings, we call them audit findings. Any other questions?

MR. NORTON: I think, if you have no more questions we should move on to -- Mike, do you want to go through 18, 2, 4, 5, 6, and 7 which are all yours, all

dealing with apparently Bechtel audits and then hold the questions until you conclude those five subjects or five items?

MR. JACOBSON: Sure. Mike Jacobson, Criterion 18, item 2. The observation is lack of QA audit documentation of specific materials reviewed to close out the audit findings. Reference is made to Bechtel audit 28.1-1, quality audit findings 1 and this is from transcript page 86. The DCP procedure are for project audits, requires the justification for close out be documented on or with quality audit finding form. In practice, there are several ways you can meet this requirement. In this particular case, we found that the specific materials reviewed were recorded on the auditors work plan log which is a document that he maintains which documents the completion and monitoring of activities, audits and other assigned tasks.

In addition, the general method of closure was documented on that quality audit finding form itself. So these two documents together meet our procedural requirements and it did define the specific materials reviewed.

MR. NORTON: Could you speak up, please?

MR. JACOBSON: I'm sorry. The work plan and log is a QA record and is retained and is readily

retrievable and we had put an additional copy of that with the audit file to further assure that that information would be available.

The opinion was also, the observation was also made that in performing the audit close outs, a large number of documents could be reviewed. In this particular case, which had to do with the proper use of calculation cover sheets and the administrative organization of calculation of packages, as corrective measures, engineering had performed a complete review of all final OPEG calculations to make sure it was corrected and in view of the larger, the complete review by engineering, it was not necessary for QA also to take a large sample. Instead, they chose to take a relatively small sample to confirm the acceptability of the engineering review. The sample that he took was adequate in his judgement.

We've gone through other findings on OPEG, looked at the documentation for closeout and we've found other instances where the specific materials were reviewed were recorded on the work plan log and we have included copies of those documents in the audit file and I believe that resolves this issue that it has no generic significance.

Criterion 18, number 4, the observation is lack of technical QA audits to independently verify that OPEG calculation inputs were checked to be in compliance

with engineering procedures. Reference is made to PG&E audit 83178 and Bechtel audit 28.1-1, transcript page 69 through 71.

We interpret the concern to be applying the 10CFR50 appendix B, requires technical audits and the procedures for audits of quality is that it did not require that. And, we would define technical audit which we understand observation to be a documented review activity with the same general format as the QA audit, but with an expanded scope to include verification with technical adequacy, such an audit would be performed by individuals with appropriate technical qualifications. It would appear that this observation is directed at requiring under criterion 18 as an audit function. The task and functions that are actually required for criterion 3 design control by way of verifying or checking accuracy of the design. We disagree with that interpretation.

In implementing Criterion 18, the NRC has endorsed with certain exceptions NC 45-2 and 45-212 and 45-212 provides the requirements and guidance for establishing a system of audits and QA programs. And, these audits, our aim primarily are to verify compliance with the QA program that determines our effectiveness. To our knowledge, none of these standards require technical audits. Therefore, we believe there has been no

violation of Criterion 18.

QA programmatic audits have been conducted and relative to the OPEG group, the scope of that audit program has included all major areas of design activity and as Tom has mentioned, PG&E has also conducted audits of OPEG.

The verification of the technical requirements of the design documents as performed by engineering is part of their design control process and this can vary from checking to independent reviews by chief engineers or by outside agencies depending on the significance of the design load.

It should also be noted that the IDVP did an audit of small bore piping support and design at OPEG with an emphasis on technical interface control and project indoctrination.

This was termed a design office verification and specifically included correctness of technical inputs and is similar to a technical audit.

In summary here, we do not believe that technical audits are a requirement and this item therefore has no generic significance. Additionally, IDVP has audited the area of technical interface control of OPEG.

(Pause)

MR. ALLISON: Just a comment. Most design

organizations do technical audits including Bechtel where I've looked at them before so I think from a technical standpoint the second part of your answer, it's probably more significant than the first. That it's not required by appendix B.

MR. VOLLMER: Can't hear you, Denny.

MR. ALLISON: Oh, okay, I just said it seems to me that most design organizations do do technical audits and so, the second answer is probably, bears more on the significance of the finding than the first one does.

MR. VOLLMER: The fact that the IDVP did audit --

MR. ALLISON: Did a lot of it, yes.

MR. VOLLMER: I was going to ask this -- I thought we were going to go further before questions but since you've opened the door, what were the results of the IDVP audit of OPEC activities?

MR. ALLISON: To the best of my recollection, there were no findings issued as a result of that audit and I found that the technical interface control and indoctrination to be satisfactory.

MR. TAYLOR: Would you say that again? I'm sorry.

MR. ALLISON: To the best of my knowledge, there were no findings issued as a result of that audit. I'm trying to recall.

MR. VOLLMER: Just for the sake of information, could I ask a Bechtel representative? Is that their current practice to do technical audits in addition to the programmatic audits beyond design control? Like Denny indicated that at least at one time they did.

MR. JACOBSON: Oh, I think I can address that question. There is no difference between the Diablo Canyon Project program, the current Bechtel program in that regard. Bechtel uses a design verification system which, as I stated, depends on the significance of the design. It could be an integrated design review, review by chief engineers or in very simple cases, just the checking itself. To my knowledge, they do not -- the standard Bechtel program, the San Francisco power division at least which I'm familiar with, does not do technical audits as a requirement.

MR. VOLLMER: You're saying this program is conducted under the Bechtel topical report of QA?

MR. JACOBSON: Yes, that's correct.

MR. VOLLMER: The requirements of that particular topic.

MR. JACOBSON: Yes.

MR. ALLISON: I suppose I ought to tell ycu where I got my information. I looked at the Snubbs project and in there they do a lot of technical audits which the client,

although I believe it was at the client's request, although Bechtel does it internally with off project people. And, I looked at Byron and there the utility does it, finding people so I guess in both of those cases that I looked at, it was at the client's request or insistance that those were done.

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MR. TRESLER: I think we may be dealing with semantics here. I think MIke is saying that as a part of the internal auditing program that is performed by QA, that technical auditing is not a part of that. If you recall, we did identify that in the case of Cygna, Impell and work performed in the project, there is essentially a technical -- there is technical auditing performed by these independent groups that I described.

In the case of Westinghouse, technical audits were performed, but not as a part of the QA function. Instead, as a part of the technical group's responsibility.

MR. SHIPLEY: I might add also to what Mike said. He indicated that it was not a current San Francisco power division requirement to perform technical audits. And while that's true, the chief staff does perform technical audits on projects as an independent function. It is not high up necessarily with a QA audit, and so -- I'm providing additional information to what Mike said. So -- I didn't want it confused between a requirement and what is practice.

MR. VOLLMER: What forms the basis for a section -- a technical audit, since we used that term? When it does occur? Is this when problem areas are found, or is this on a periodic basis or what?

MR. SHIPLEY: It's on a periodic basis.

MR. VOLLMER: Is this established anywhere

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procedurally, or just as the management feels it's necessary?

MR. SHIPLEY: It's the latter. It's not established procedurally.

MR. NORTON: I might point out that this area highlights something that I think has been occurring all day. A lot of these answers, and this is a classic one, where someone says, gee, there was not requirement for that, and so therefore, we don't think it's a violation or we don't think we've violated some requirement of the Regulations. The net result of that sounds like we don't think that the observation had any merit without further explanation. And that is not necessarily the case.

For example, our February 7th submittal on this very form at page 47 and 48, and I quote, we say, "While the project's audit program is in full compliance with QA requirements and implementation criterion XVIII, we believe that there is merit to the suggestion of formal technical audits for OPEG. It is therefore planned that a program of such audits will immediately be developed for OPEG on the following basis." And on page 48, there's three paragraphs to describe that. So I don't want you to go away with the impression that just because someone says we don't think it's a violation, it doesn't mean that we still don't think it has merit, and that we haven't made changes. I see poor Mr. Yin sitting back there, and I'm sure he's hearing, oh, my gosh, they don't

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agree with anything I've said. And that's not necessarily the case. While we might not technically agree that there's a violation or something, we believe that many of these things have merit, and have done things about it. Have done studes, reviews and so on, in response to those concerns, and I don't want that to get lost here today.

MR. VOLLMER: Thank you for that observation. Very good.

MR. JACOBSON: Criterion XVIII, No. 5, observation an audit was planned to verify that OPEG issuance of discrepancy reports was being implemented in accordance with procedures. Bechtel QA audits at the site were inadequate, and the audits were not conducted or verification laid to determine the adequacy of OPEG action that was taken to identify and correct design deficiencies. OPEG should have generated dei ciency report giving the amount of work performed. The reference is made to the transcript, page 72.

This item concerns audit area area 28.3 which is entitled "Handling of Non-compliances." The intended scope of that audit was evaluation of on-site engineering and compliance, requirements in the preparation and control and dispositioning of non-conformances and supplier non-conformances.

The scope of this audit did not include preparation and control of discrepancy reports which is the subject of the concern. It wasn't said directed to non-conformance

reports which are a higher tier QA deficiency document than a discrepancy report would be used to document significant quality problems such as potentially reportable items.

This audit was rescheduled on two occasions due to lack of activity in the intended audit area. For example, the auditor documented a situation in his work plan and log with the following reasons. First, no NCR's had been issued at OPEC, and second, OPEC has no involvement with suppliers non-conformances.

So the situation was we attempted to do the audit, and could not really find anything to look at.

Our procedures allow audits to be postponed due to insufficient activity in an intended audit area. The audit was rescheduled by procedure to look at the area again later.

I guess the rest of the concern was that the auditor just finally followed the procedure without considering whether or not there was a problem at all. How come so many people have not generated a single discrepancy report?

In this respect, it was intended that the generation of discrepancy reports would be reviewed by QA in other ways. For example, we had another audit area, 15.1 which specifically addressed discrepancy reports. Audits in this area were performed to evaluate engineering's compliance with the requirements for preparation and control of discrepancy reports. These audits, however, were performed in the San

Francisco office.

Since the discrepancy reports prepared by OPEG were logged, controlled and finally signed off in San Francisco, they were included in this audit scope. We did find that at least three DR's had been issued by OPEG in late 1982, and one of these was specifically included in the audit sample for audit 15.1-1. This was performed in April '83.

Additionally, the expectation was that auditors in the other areas, when they were looking at preparation of calculations or preparation of drawings, when they're doing those audits, they'd be alert to situations requiring a discrepancy report. And if such had been generated, they would then address that problem.

Further source of information available to project QA was a program for trend analysis of design deficiencies. This program involves a review by QA of various documents prepared by engineering for evidence of design deficiencies. And this program is described in our QA department procedure C-20, and has been in place since the inception of the project.

In summary, we believe that there was no violation of procedural requirements due to the rescheduling of the audit. And that QA did review the preparation and discrepancy reports.

MR. VOLLMER: Questions?

(No response.)

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MR. JACOBSON: I'll go on. Criterion XVIII, Item 6. Observation: an audit was planned to verify proper control of issuing and distribution of OPEG's procedures. This audit is 28.5.

The auditor discovered that since March of 1983 the control of OPEG's procedures as conducted at PG & E and Bechtel San Francisco offices, there was no attempt made to revise the audit checklist to cover these activities. In other words, it was found that the audit could not be done at the site, but there was no attempt to change the audit to still audit at San Francisco. So that particular audit has been postponed maybe three or four times. Reference the transcript, page 73.

The planned purpose and scope of this particular audit was to evaluate OPEG activities with respect to issuance and distribution of implementing procedures. It was not originally intended to cover such activities wherever they're located because the activities in the San Francisco office were being audited by a separate group, using audit planning more tailored to that office.

The statement of concern is correct. The auditor at the site was unable to perform the audit because the control, issuance and distribution of the procedures OPEG was using, referring to the piping procedures, were located in the San Francisco office. The audit was rescheduled on

several occasions, according to procedure.

Our requirement is to audit the area at least once per year. One reason for rescheduling the audit was to review the period later on since it was possible that OPEG could generate other implemented procedures that would be control over the site. However, this never took place.

We agree that it would have been appropriate to restructure the audit and perform it in San Francisco. That is, in fact, what we are doing. It's our current practice.

One reason why it was not rescheduled during the March 1983 time period was that the area had just been reviewed during our Reedy Associates followup audit which they performed on March 17, 1983. Reauditors have just looked at this area and have documented that there was objective evidence through the adequacy of current control and procedural documents. And here they were referring to engineering manual procedure 5.2 which is governing requirements for implementing procedures.

Additionally, the DCP QA group is on control distribution in the OPEG implementing procedures, and was therefore in a position to be aware of the irregularities in the approval and distribution of these procedures.

The summary here is we agree that it should have been done, and it would have appropriately been done in San Francisco, and was not done because another audit had

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recently been completed. The satisfactory results of that audit gave us assurance that there was no significant impact as a result of the rescheduling.

MR. NORTON: Do you want to finish up with Item 7, Mike?

MR. JACOBSON: Criterion XVIII, Item 7. Observation: approximately ten months later, the audit checklist, again referring to 28.5, was modified to cover the related OPEG activities. It's my conclusion that the benefit of the timely audit to insured program compliance had been compromised, Transcript, page 74.

And the observation continues: the audit checklist was modified to cover the portions of the work activities at OPEG.

Going to the response, this is really a continuation of the previous item. It is correct that during late 1983, we made a decision to broaden the scope of this audit, 28.5, so it could be performed at OPEG. Checklist was revised, and I would also like to say that it was not really just a limited portion that could be done at OPEG. The checklist was substantially expanded from about three pages to an order of 20 pages. And it was really a different approach at looking at implemented procedures.

There is little significance to this event. The previous audit finally had was approved. It was acceptable.

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It included all the areas of OPEG activity. This was simply an effort to broaden and strengthen our audit program. The revisions to the checklist were reviewed and approved in accordance with procedures.

A change does not mean that the planned audit program had not been carried out prior to the change, but it had become apparent that the previous checklist was not yielding useful information at the jobsite. And a modified approach would be appropriate.

We believe there is no procedural deficiency relevant to this item.

MR. NORTON: I think that concludes those five.

MR. TAYLOR: This is Jim Taylor. I take it that last answer, you expanded the checklist to cover these particular areas, is that the implication that I get from the OPEG group?

MR. JACOBSON: Yes, the checklist that the auditor was attempting to use was not usable because the control he's trying to look at was in San Francisco. We revised the checklist to take a different approach to look at things that were auditable there.

MR. VOLLMER: Questions? Okay, no questions from this group?

(No response.)

MR. NORTON: VII-1, Mike, is that combined with

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any of the others under VII?

MR. JACOBSON: No, it isn't.

MR. NORTON: All right.

MR. TRESLER: The next item is Criterion VII and observation number one. It's noted on the transcript pages 77 to 82, and our summary of this observation is that there was no documented proceduralized control relative to the design interface between P G & E and Westinghouse for performing seismic reverification work.

All design activies and documents including criteria methodology, work scope and drawings and analyses have been controlled as required by written procedures, and all of these information transfers have been documented. The procedures which establish interface control requirements for PG & E are contained in the engineering manual, and they are procedures 3.8, design documents prepared by AE's and the consultants, and 4.6, which is contract administration.

These procedures require a discipline engineer to be assigned responsibility to assure interface control, logging and distribution of all design information transmitted to the consultant, approval of design criteria prior to transmittal to the consultant, documented acceptance of consultant work, and incorporation of the consultant documents into the PG & E document system.

The criterion procedures were transmitted by letters

with a return receipt required from the consultant. This system is consistent with the way we've distribution for criterion procedures for -- within the piping discipline and to all consultants.

The work scope and drawing transmittal is also accomplished by letter. All letters were assigned a unique number, logged and distributed according to a fixed distribution indicated within the procedure.

The Westinghouse correspondence and document control system is similar to that described for PG & E and is established in Westinghouse interral procedures. These procedures require systematic transmittal of correspondence and logging of correspondence. All submittals of information and results of Westinghouse design and analysis were transmitted through these control procedures from Westinghouse to PG & E.

The interface between Westinghouse and PG & E was specifically audited by Reedy as a part of the IDVP, and the results of this audit were documented in the interim technical report No. 11.

In summary, we feel that the transmittal information, criteria, drawings, and all aspects of the program have been very well controlled.

MR. VOLLMER: Is this aspect audited by the PG & E QA organization. You mentioned Reedy had audited. Has it been

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the subject of your audit? Mike or --

MR. TRESLER: I'm sorry, I missed the question.

MR. NORTON: I think it would be Tom DeUriarte to answer that.

MR. VOLLMER: Tom, the question is has the transmittal of information from Westinghouse to us and us to Westinghouse been included in any QA audit?

MR. TRESLER: I'm sure it has while they're deciding because the issue of distribution and maintenance of procedures up to date, etc., has been the subject of QA audits. I just can't recall the specifics of one related to Westinghouse.

MR. DE URIARTE: Excuse me, the only thing I can remember is an audit was performed during the IDVP activity. I can't recall a specific audit prior to that. That doesn't mean it didn't occur. I just don't recall it.

MR. VOLLMER: Were there any findings in the Reedy audit that you can recall?

MR. DE URIARTE: No.

MR. TRESLER: I might say that this, you know, this relationship that we've had with Westinghouse was established prior to the corrective action program, the design verification program, but was tightened up and strengthened prior to beginning our corrective action program. And it's a pretty solid program.

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MR. ESSELMAN: My name is Tom Esselman from Westinghouse. I know for a fact from the point of view of internal audits within Westinghouse, that internal audits have covered specifically the transfer of information according to procedures both into Westinghouse, and from Westinghouse back to PG & E. It has been covered in specific internal audits.

MR. VOLLMER: During the period of design reverification?

MR. ESSELMAN: Yes, sir.

MR. TAYLOR: Are those audits made available to PG & E, the results of those audits?

MR. ESSELMAN: The results of internal audits are kept in our files, and are available to PG & E auditors when they come to audit Westinghouse. Part of what PG & E would do is audit our audits, and those findings are made available at that time.

MR. TAYLOR: Are your findings of material transferred across this interface -- do they show that this has been a formal system, that it's worked to -- you mentioned sequential letter numbering?

MR. TRESLER: That's correct.

MR. TAYLOR: That that system has worked satisfactorily.

MR. TRESLER: We just did a recent check on this item, and have found that every piece of information

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transmitted to Westinghouse which required the return receipt, we've located the return receipt. So we're certain that that aspect of the system is working.

MR. KAHLER: Mike, if I may correct you on that item, there were a couple of instances that we have not been able to find return material. It's -- we have verified and that's one of the items to cover -- that we would cover under Criterion VII, Item 2.

MR. VOLLMER: Item what?

MR. KAHLER: I'm sorry, under Item 2.

MR. ESSELMAN: Let me state -- Tom Esselman from Westinghouse again -- that transmittal through formal channels has been used at Westinghouse for many years and is a very rigorous procedure, and has been followed on this job as it has on all the other jobs.

MR. VOLLMER: Item 2.

MR. KAHLER: Item 2. Criterion Item 2, the observation can be broken down into two parts. The first part is lack of evidence of receipt of controlled documents by the contractor. As Mr. Tresler's described, there is in place a controlled receipt return issue process with a distribution of procedures and criteria to the contractors. When the inspector was in the office looking at this interface with Cygna, Impell and Westinghouse, it is true that there were documents that were not available during that inspection.

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We have gone back to these three particular contractors and have confirmed that the information that was transmitted to them was available in their files, but we have not been able to recover all of the signed receipt returned letters.

MR. VOLLMER: What normally happens to these when you get them?

MR. KAHLER: I'm not sure, sir. The investigation hasn't really got into that area of it yet. We've just identified that we did not have them available in our files, and we have requested the contractors to check their files and records to see that, in fact, where we did not have the receipt returns, that they in fact did have the information available from their files.

MR. VOLLMER: It would also be nice to follow up where you don't have a receipt, and find out whether or not you had taken action in the other direction.

MR. KAHLER: Yes, sir, that's -- we will plan to do that.

MR. TAYLOR: I think the previous item about the interface is largely meant to have a unit like PG & E when you're using a contractor, like Westinghouse, acknowledge that they're two different systems, and that, I think, that the auditor -- I don't want to speak for Mr. Yin, but I think the concern was there's no procedure that prescribes how those

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two different entities interface and they might cover such things as who disposes of all -- make sure that all the letters are acknowledged, receipted for, the information is properly transmitted and so forth. Maybe that exists. Does it?

MR. TRESLER: I'm sorry, but Ed, we talked about this before. The distribution of procedures and criteria is an example. The earlier stages of the job was handled out of the piping discipline. And it was the mechanical administrative section that received or was on distribution for the return receipts from Westinghouse. And they were required to periodically -- I don't believe that the period was specified, but they were required to periodically verify that all return receipts were in place.

Now, later on, this responsibility for distribution was transferred from the mechanical discipline to the administrative section, and I'm not certain -- maybe somebody is -- I believe there is a follow up on return receipts.

MR. KAHLER: Yes, that is absolutely correct.

MR. TAYLOR: Well, in addition to the document flow, I would expect an interface procedure to prescribe the limits of authorities of the two respective organizations, and you know, exactly what responsibility -- does that procedure exist?

MR. TRESLER: Oh, yes, there is a procedure, but I

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think it's one of the contract documents which identifies --

MR. TAYLOR: It's a contract document?

MR. TRESLER: Which identifies the individual responsible for corresponsdence within PG & E, in other words, who Westinghouse writes to within PG & E, and vice versa for PG & E corresponding with Westinghouse. Does that --

MR. TAYLOR: Yes, I guess the thrust -- I have not reviewed these documents -- the thrust of my concern is that I would suspect you would be particularly sensitive to the interface with other design organizations and subcontractors doing design, that's all And I suspect you would be ultra careful in setting up procedures to ensure that that interface is appropriately covered and that it works. I don't mean to preach at you, but that I would have expected it.

MR. TRESLER: Let me help you a little bit -- or help ourselves. We were sensitive to that. And in the case of Impell and Cygna, we developed a procedure that was specific to those two organizations. The reason we did that is that the relationship between the project and them was more complex in that Westinghouse was essentially doing work that they had responsibility for from the first day on the job. In other words, the branch piping off the reactor coolant loop. Also, the spectra sets for the piping analysis in the case of Cygna and Impell were generated on project. In the case of Westinghouse they generated their own. And lastly,

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in the case of Westinghouse, they had responsibility for the piping and all of the supports on that piping whereas Impell and Cygna had a sharing of support across analysis. In other words, the project could have done an analysis and Impell would be doing a few of the supports. And that's why we developed a more rigorous procedure for controlling that interface.

MR. ESSELMAN: Allow me to comment. Tom Esselman. The examples of the interface procedures between Westinghouse and PG & E are -- in that we used the correspondence procedure PG & E has clearly defined to Westinghouse in letters scope, extent of responsibilities to begin the project, and in about June of 1983, as we were finishing many of the reverification analyses, PG & E issued to us a letter that explicitly stated the interfaces that separated Westinghouse from other areas, and we have generated a very specific interface book that is voluminous and it sets out things such as nozzle by nozzle, what are the thermal motions? What are the float head loads? What are the nozzle loads? What are the displacements of piping and pipe with restraints, etc.? So we have very carefully and explicitly set out -- as you have stated, limits of authority and defined very carefully the places where PG & E and Westinghouse need to interface in transfer of information. Those manuals or interface documents have been maintained and kept up to date, and as new analyses are per-

formed to conform with as-built conditions, for instance, that interface document is kept up to date. I believe that the interface is well defined.

MR. TAYLOR: You addressed the PG & E and Westinghouse interface, and I'm trying to address the generic issue of interface with other organizations in the PG & E -- I would hope would develop model interface procedure for using contracted and other engineering services. I hope -- because you're going to use -- if you continue, you will have other contractors.

MR. TRESLER: We developed a number of tools within our house to insure that control, computer tracking system for supports. We know who has responsibility. We know which analysis revision that support had been designed to, and we do that for every consultant. There were many tracking systems and we know who was doing what, and when it was done and the way it was done.

MR. TAYLOR: Okay.

MR. KAHLER: If I may continue, there was a second part of this, but we got off into questions too before I had an opportunity to respond.

The second part of Item 2 is characterized by "procedures were sent to contractors without designation of those that applied to their work." This is from the transcript, page 83.

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Well, the observation is correct, but we do believe there's no regulatory basis for the concern. It is common practice to provide procedures to organizations and individuals with instructions to use as applicable.

The contractors in these cases, Westinghouse, Cygna and Impell have been involved with numerous nuclear plant projects for a considerable period of time. Plus the fact that generic requirements for piping and systems and piping support design are well known to these particular contractors.

Again, this was one of the reasons they were selected for doing this work. We feel that it's a realistic expectation that when an experienced contractor is given a complete set of procedures, he will be able to discern which procedures are applicable to his assigned task, which ones provide useful but not essential information, and which ones do not apply.

In addition, the contractors were advised in documented interface agreements that they were to internally apply their own quality assurance programs and implementing procedures.

The agreement further clarified the Diablo Canyon Project would provide all mandatory design criteria and subtier procedures for the contractor's information, and for use in achieving consistent results. Furthermore, all design documents produced by the contractor have been reviewed and accepted by the project prior to issuing them for construction.

MR. ALLISON: You're saying that all of this was nice to know information for the contractor. And the requirements on the contractor were defined elsewhere, is that right?

MR. KAHLER: Some of the procedures, I believe, they were requested to use. For example, how to package the calculations because we wanted a consistent format coming back to us from these contractors, you know, what cover sheets to use, what checklist to use, what format to put their information in, things like that. And that was just basically how to package the information.

The criteria that they were to use in the design development was, in some cases, supplied specifically for their use. As Mike pointed out in the case of Westinghouse, they basically developed their own seismic response factor for the portion of the piping that they had -- have had --

MR. TRESLER: Now wait. We provided the spectra to them in the form of a design criteria memo. The point I was making is that their scope of work included generation of spectra sets for the individual piping analyses, whereas in the case of other consultants, the project retained that responsibility.

MR. KAHLER: You're right. Perhaps I didn't make myself clear enough in that aspect.

MR. TRESLER: I -- the procedures and instructions that were distributed to the contractors, the contractors

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were required to comply with them. Now, we may have included in our distribution of criteria, as an example for Westinghouse, the procedure for performing piping analysis by spacing criteria methodology, but the scope document with Westinghouse clearly identified that they were to perform piping analysis, computer-based piping analysis for the piping within their scope of responsibility. So, in that case, that procedure, though in their possession, was not needed. That's simply the point. Does that make it clear?

MR. ALLISON: Well, I'm having trouble understanding, but I guess you're really saying -- I guess, a lot of those procedures were mandatory, but it was up to Westinghouse to figure out that they didn't need to use the small bore pipe design procedure because they had other ways, but they did need to use the -- how to package a calculation procedure to send it back to you.

MR. KAHLER: That's correct.

MR. ALLISON: And you relied on them.

MR. KAHLER: That's correct. I don't know at what point in time, but at some point in time in '83 we changed our policy on distribution of piping procedures and instructions, and only distributed those to the contractors that we felt were required for them to accomplish their job. In the early stages, as we developed the procedures, everybody was on distribution for all procedures, period. And certainly we

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would expect the people to be able to understand that if they weren't doing the work, they didn't need to apply that procedure.

MR. ESSELMAN: I'd like to clarify one statement that was made. We would not decide not to apply a procedure because we had other ways. We would decide not to use the small bore spacing table criteria memorandum because we had no small bore piping in our scope, as an example. The criteria that did apply to our work was used in the performance of our work. We may have received criteria memorandum that were not related to the work scope that was defined to us by PG & E, and those criteria memoranda we would not use in performance of the work.

MR. NORTON: I might point out that I -- in discussing this over the weekend, this is another one of those that you might be able to reduce the risk of someone using the procedure that didn't apply to them by not sending them that procedure, but then you increase the risk of not sending them a procedure that they need to use, see? And it's one of those things where again, it's a -- there are negatives on both sides of the question, and they opted in this case for sending them procedures, and figuring Westinghouse would know, for example, that they weren't doing small bore and wouldn't apply small bore criteria, but did have all of the procedures to all of the contractors.

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MR. TRESLER: Bruce, this is Mike Tresler. As I said, in the early stages, we distributed all the procedures, and really, one of the reasons for that is driving off of your point, and that is that we weren't certain as to what scope might look like in time with, for example, Westinghouse. It could be that we would choose to extend the scope of their responsibility to include that, and therefore, the procedure for that work was in place, and we were clean.

MR. VOLLMER: Okay. I think we can proceed to the -- well, the next item -- technical audits I think we've covered. Unless you have more to say.

MR. NORTON: Yes, we have covered it. Mike, if you take a look at the draft, you might want to talk about just, say, the middle of page two to the end of that draft response because the first part you've obviously covered in your previous, but there is a slight difference between this one and the others.

MR. JACOBSON: Yes, in this case, the project installing requirements of ANSI N 45 213.

MR. NORTON: Excuse me, I think you better state the observation first.

MR. JACOBSON: Yes. Criterion VII, Item 3. The observation is technical audits have not been performed by P G & E and/or Bechtel of the design and analysis activity conducted by Impell, Cygna and Westinghouse. And the

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reference is to the transcript, page 85 and 87. 85 through 87.

And to begin again, the main difference here is in the application of requirements. We're following for control procurement of items, ANSI N 45 213, which delineates numerous methods a purchaser may use to accept an item of service. The standard states that the purchaser may accept the service by any or all of the following: technical verification of data produced, surveillance and/or audit of the activity, review of objective evidence for conforming to procurement document requirements.

The technical adequacy of the supplier's designed work although ultimately the responsibility of the licensee is first the responsibility of the supplier. Accordingly, these aforementioned controls are specified in our audit to provide adequate confidence that they have achieved that technical adequacy.

Beyond that, however, there is technical verification of the supplier's design output by technical review. This technical review is aside from the supplier's -- I don't want to say that. The technical review is aside from the audits performed on the supplier's QA program for compliance to that program. In Diablo Canyon, the output of an engineering service contractor, Cygna and Impell, is individually reviewed by the project. The acceptability of their work

is documented as a result of that review.

This activity provides continuous overview of the design output of these contractors, and effective control of the contracted services.

This activity is performed in accordance with engineering manual procedure 3.8.

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MR. JACOBSON: We believe these technical reviews of the contractors' output are more extensive than anything that would be accomplished through periodic technical QA audit. And that this technical review fully complies with NCN 45213 requirements.

With respect to Westinghouse, which is a little different, they're a PG&E contractor for engineering services. Audits for compliance with Criterion 3 of Appendix B have been performed by PG&E. And, in addition, technical audits in the sample of Westinghouse's piping design work have been conducted by the Diablo Canyon Projects.

MR. VOLLMER: Did I hear you correctly say that an audit, a programmatic audit was conducted on these contractors during this effort of design reverification in the area of design control Criterion 3 for all contractors?

MR. JACOBSON: Yes. For Cygna and Impell audits were performed by Bechtel and staff since they are contracts with Bechtel, our corporation. PG&E has audited Westinghouse, as I believe that was discussed -- has that been discussed? That will be addressed as a subsequent item.

MR. VOLLMER: Is their a design review process substantially the same as what we've talked about before? I realize that they all have to meet or do meet NCN 45 or 11, or whatever. But, they generally use the checker system or they use a design review process?

MR. TRESLER: Yes, they use the doer or checker or approver process.

MR. FRIEND: There's one other step in the project review that are results when if perceived also in addition to their own internal --

MR. TRESLER: That's correct.

MR. VOLLMER: I'm sorry, I missed that, Howard.

MR. FRIEND: The project chief, PG&E and Bechtel engineers, also review the design packages that come from these contractors as part of the acceptance process.

MR. VOLLMER: You're saying that's like a design review process, not a checker process?

MR. FRIEND: It's another review over and above their own internal process.

MR. TRESLER: It was not a cursory review. It was a very thorough review.

MR. NORTON: Item 7, 4? That's you again, Mike.

MR. TRESLER: Criterion 7, item 4, observation: Internal procedures used by contractors were not reviewed by Bechtel, PG&E, that is, Westinghouse, Cygna and Impell. Reference to transcript page 38.

Upon entering into a technical services agreement with Cygna and Impell, these two contractors' QA manuals were reviewed by Bechtel to ensure that their QA program incorporated essential elements of NCR50 Appendix B. This

review included assurance that their program contains sufficient requirements to demonstrate compliance with Criterion 3 and other Quality Assurance requirements imposed by the Technical Services Division and the review also verified that the contractor's QA program contained adequate provisions for preparation and control procedures that implement QA programs.

Implementing procedures themselves are normally not reviewed in the process unless the QA program manual itself does not include sufficient information to demonstrate its compliance with requirements. In the case of Cygna and Impell, the QA manual review was sufficient. To our knowledge, there's no regulatory requirement for additional engineering review of contractors implementing procedures.

Instead audits are performed on Cygna and Impell to review their process of preparing and implementing procedures and to verify the implementation of those procedures. Audits were performed of these two organizations in June of 1982. No findings were generated in these areas.

As we just noted, the piping and design work of Cygna and Impell was reviewed by the project which provided further evidence of contractors implementing procedures that were sufficient to provide an acceptable design product.

Similarly, PG&E has qualified Westinghouse to supply engineering services under the quality assurance requirements of the PG&E contract with Westinghouse.

Sufficient QA and technical audits were conducted by PG&E to ensure that the appropriate procedures would follow.

MR. NORTON: I think that concludes item 4. Questions?

MR. VOLLMER: Questions?

MR. NORTON: Mr. DiUriarte will now do 5 and 6.

MR. DIURIARTE: Criterion 7, item 5, the observation from transcript page 93, PG&E did not perform program type audits of Westinghouse in 1983 when most of the program and analytic work was carried out.

Before I respond to this observation, one of the items I'm going to discuss in this answer our audit of May, 1982 and one of the people behind me has just pointed out to me that in that audit, we did review the interface control that was questionned earlier.

As it states here, reviewed interface control and chronological file and found one document that had been transmitted informally to PG&E to discuss this with project personnel. We're assured that this was not a generic problem.

MR. NORTON: Excuse me, do you want to do 8(a) and

and 8(b) along with 5 and 6 because they both also appear to be --

MR. DIURIARTE: Yes, I think so.

MR. NORTON: All right, we'll do those four then, right now.

MR. DIURIARTE: Anyway, in the conclusion of that interface control review is that the interface had been formalized with the project and that audit was conducted in May of 1982. That question was answered and asked earlier.

In response to the observation in item 5, NCN 45212 requires that work be audited as early in the life of the activity as practical. A comprehensive audit of Westinghouse's Monroeville facility was performed by the PG&E QA department early in the life of the IDVP project on May 25 to 28, 1982 to ensure timely implementation of the quality assurance requirements.

This audit found the Westinghouse QA program to be implemented satisfactorily. Previous to the May 25, 1982 audit, PG&E performed a review of the Westinghouse review program in late 1981. The results of that review are summarized in a report which is entitled, the PG&E Look Back Review Summary. That review found satisfactory implementation of the Westinghouse program. Both of these reviews confirmed previous reviews of PG&E

audits of Westinghouse which had found that program to have been satisfactorily implemented.

Based on the results of the '82 audit, the 1982 Look Back Review and the previous audits of Westinghouse, PG&E scheduled its next audit of Westinghouse for May of 1984. This schedule is well within the tri-annual audit schedule recommended by Regulatory Guide 1.144 and the K's (ph) Topical (ph) Report (ph) of September 1983 which has been approved by the NRC.

As an additional comment on this item, NRC Docket 99900404 dated April 31, 1981 states that licensees and applicants who invoke Westinghouse's Quality Assurance Program as described in their topical report, WCap8370, revision 9(a) are not required to perform initial source evaluation audit nor subsequent periodic audits to assess Westinghouse's quality assurance program implementation.

PG&E contracturally required Westinghouse to perform their work on the PG&E seismic reverification program to the requirements of the Westinghouse Topical report dated 3/70, revision 90.

I'll do item 8 next. Criterion 7, item 8 -- Item 8 is broken into two parts. The first part, the observation is, the Westinghouse internal audits were inadequate and unacceptable in boththe QA and technical

areas. The QA program type audit was deficient in that there was no discussion of what specific areas of safety rejection system and pressurized surge system they had selected for review in the past as documented in Audit report 1(a)-83-03.

The Westinghouse program as described in the Topical Report WCap8370 revision 9(a), amendment 1 requires that audit activities be documented in accordance with regulations. NCN.5212 requires that the audit report include a summary of the audit results and description of each deficiency in sufficient details to assure that corrective action can be effectively carried out by the organization. Westinghouse internal audit reports contain a summary of audit results and a description of the activities audited. The reports also contain descriptions of deficiencies in accordance with the above requirements. Westinghouse internal audit report 1(a)-83-03 contains a summary of audit results and a description of the PG&E unit 1 work audited. The report related one deficiency related to delegation of authority on PG&E projects. Corrective action was effected during the audit. There were no other deficiencies identified in PG&E work reviewed during the subject audit. In addition, PG&E's quality assurance department reviewed Westinghouse's internal audit during PG&E's May, 1982 audit, found the Westinghouse

audit program satisfactorily met PG&E's requirements for conducting and documenting the audit.

The second part of item 8, the observation is from pages 108 and 109 of the transcript. Westinghouse's original audit checklists, findings/records, had been systematically destroyed in accordance with Westinghouse management policies. On the next page of the transcript, it's stated, I would categorize it as deviating from Bechtel and PG&E's program.

PG&E retains audit records in accordance with Reg Guide 1.144, January 1979, and NCN 45212, 1977. Those governing documents require that a written document be prepared that identifies a written check-list procedure to be used to conduct the audit. The audit record is required to be retained and includes the audit plan, the audit report, written replies and the records of completed corrective actions. These requirements do not include the retention of completed audit checklists or auditors notes. There's no regulatory requirement to maintain these records. PG&E does not require its suppliers to retain completed checklists or auditor notes. PG&E audit of May 25, 1982 verified that Westinghouse prepared and retained the required records. Westinghouse does not have policies that require the systematic destruction of documents but rather has a policy for the

systematic retention of documents. Documents not required to be retained may be discarded.

MR. NORTON: I suspect that you may as well do number 9, Tom, which is internal Westinghouse audits, seeing as how, rather than letting it how.

MR. DIURIARTE: Criterion 7, item 9. The observation is that Mr. Yin stated that there was a lack of technical audits by Westinghouse during the period of this design reverification.

Technical audits by Westinghouse, like Westinghouse Engineering Services are not required by the regulatiions. Technical design verification performed by Westinghouse was sufficient to satisfy regulatory requirements however, in addition, PG&E independently performed technical review of the work. Our position that technical QA audits are not required was addressed generically by Mr. Jacobson in response to Criterion 18, item 4.

Design verification required by Criterion 3 of Appendix B was performed for the Westinghouse QA program for design control. PG&E has performed audits of the Westinghouse design process to verify that they followed their followed their QA procedures in accordance with the requirements of Appendix B, Criterion 3. The Westinghouse QA program covering design verifications has

been reviewed and found satisfactory by PG&E.

MR. NORTON: Mr. Vollmer, I might at this point in time while he's not on our agenda, Mr. John Hobel, that's H-o-b-e-l, the Westinghouse Project Manager for Diablo Canyon twisted my arm at the last break that he would like to make a short statement on these Westinghouse audit observations under Criterion 7 that we have listed here and I think it would be appropriate for him to do it now before the questions are asked rather than at the end of the program.

MR. VOLLMER: Is it short?

MR. NORTON: Yes, since the other Westinghouse gentleman spoke --

MR. HOBEL: For the record, Westinghouse wishes to make a statement on the issues raised concerning the Westinghouse Quality Assurance program.

It has been stated that one, Westinghouse internal audits are inadequate and unacceptable in both the QA and technical areas, and two, that Westinghouse management follows systemati c instruction of certain audit documents.

The Westinghouse QA program is a vendor program carried out in conformity with the Westinghouse QA plan described in Topical Report WCAP8370. This plan has been admitted to and accepted by the NRC. The generic

application to all Westinghouse safety related work conducted in conjunction with commercial nuclear power plant projects -- the vendor compliance branch of USNRC Region 4 has the charter to audit and verify that the Westinghouse QA activities under the program are performed in accordance with the approved plan.

These audits as well as specific and numerous customer audits over many years have established acceptability of the Westinghouse internal QA program. The repeated reviews of the NRC QA branch and the region 4 vendor compliance branch have developed extensive documentation on the adequacy of the Westinghouse QA program.

Further, related specifically to the Diablo Canyon Project the matter of Westinghouse design work was the subject of a recently held in the Westinghouse Diablo Canyon Quality Assurance hearings conducted by the ASLAB. The ASLAB decision states and I'm quoting, "the Westinghouse QA program has been audited many times by utilities, architect engineers and professional organizations as well as by the NRC. Indeed, a number of the NRC audits of the Westinghouse program occurred while the vendor was performing the reanalysis of the Diablo Canyon NSSS with the Hosgri spectra in the late 1970s and then again in the early 1980s. There is no record of unsatisfactory performance."

With respect to Westinghouse's management policies for quality document retention, let me state clearly that Westinghouse does not have policies calling for the systematic destruction of documents, but rather has a policy for the systematic retention of documents. Documents may be discarded at bay if there's no longer a requirement that they be kept. Audit records required by regulation may be maintained and are included in those records, required to be maintained by Westinghouse policy. Audit checklists are not included by such checklists required to be retained are regulatory requirements and guidance applicable to the Diablo Canyon project.

I think you for your time.

MR. VOLLMER: Let me comment that this is not an enforcement proceeding or anything like that and the comments that were made and the observations that were made were in response to very specific findings and I'm sure we're not intended to be broadly characterizing Westinghouse's program so your reaction there is one that, we should be looking at the specific points in question and I wonder if you've gone back and looked at these in particular with respect to the first point, the audits -- no, the record retention, I understand, you have a program which I think you've laid out on what records you'll keep in what periods of time and I assume that those are being,

your program is being conducted in that way.

On the other item -- internal technical audits, have you gone back and reviewed your own auditing, ie., Westinghouse's QA auditing of the work that's been done for the reverification program?

MR. HOBEL: I didn't hear the question. Could you repeat it?

MR. VOLLMER: I said what -- well, I'll ask it this way. What auditing has Westinghouse done of the work performance during the Diablo Canyon reverification program?

MR. ESSELMAN: The most recent audit performed, internal audit perform of Westinghouse was in August of 1983. Audits, not specifically on the Diablo Canyon Project -- audits are frequently held on a multi-project basis and as I stated, the Diablo Canyon project was audited specifically in 1983.

MR. VOLLMER: Is that all program elements or selected program elements?

MR. ALSING: Let me just clarify what was said. I'm Dave Alsing from Westinghouse. The audit in 1983 was a design control audit for the structural engineering equipment department and included a large number of projects among which was PG&E Units 1 and Unit 2 work.

REPORTER: Could you please speak up?

MR. ALSING: Do you want me to say all that again?

REPORTER: Yes.

MR. ALSING: I just wanted to clarify what Tom said relative to the audit that was done in 1983. That was an audit of design control in our structural equipment engineering department. The audit included a great number of projects, among which was PG&E units 1 and 2.

MR. VOLLMER: Okay, so your internal audits cover broadly disciplines which may be encompassing a number of projects at the same time?

MR. ALSING: Yes, they are functional in nature.

MR. NORTON: I think we have 7-7 which is Mr. Tresler; it's the last item.

MR. TRESLER: Criterion 7, observation 7 comes from the transcript, page 96 through 101 and we paraphrased it as Cygna of piping and pipe support engineering consultant to the DCP did not include formal technical audits as a part of the internal auditing. Apparently, the deficiencies found in two Cygna piping analyses by the IDVP and reported in their ITR interim technical report no. 59, are used to substantiate this observation.

I think we've probably worn out the subject of internal auditing and our position on it so I'll just deal with the question of the IDVP findings relative to Cygna.

There were actually three Cygna analyses that were reviewed by the IDVP and the results that were reported in the ITR and we've carefully reviewed these findings and determined that there were 9 specific items reported in ITR 59. There were six cases of inappropriate SIFs (stress intensification factors), there was one valve modeling item, one valve qualification item and one support modeling issue raised.

In the case of the stress intensification factors, the six cases and the valve modeling issue, one case, the IDVP identified these as generic issues and reported them in an EOI and as a result the project including Impell and Cygna reviewed all analysis to assure proper valve modeling, to assure all SIFs were proper and this was conducted after these cases were reported, so therefore, we believe that issue was closed on a project basis.

The other two items in the case of the support modeling, the IDVP had reviewed the piping analysis. They went out to verify in the field that the support design was compatible with the assumptions in that analysis and they found one support that was not consistent with the analysis requirements.

Further investigation by the IDVP determined that the reason for that was one of timing. In otherwords, the analysis had been issued to the support section and the

support section was in the process of reviewing the loads in support requirements and accomplishing redesign as necessary and that support was in the redesign process and had they waited a month or two months or two weeks, I'm not sure what the time period was, they would have found the support compatible with the analysis. They came back later, performed a follow-up audit and resolved that issue. In otherwords, it was not a finding.

In the case of the one-valve qualification issue, the IDVP identified that the consultant had failed to include the effect of gravity in determining the allowable acceleration for that valve for qualification and the IDVP review showed this to be an isolated case and therefore an EOI and generic resolution was not in order.

I think to put this in perspective, we believe that the quality of Cygna analyses are equal to the rest of the analyses performed on the project. If you take a look at these three analyses, I think it would be very easy to understand, however, how there [illegible] last 2000 opportunities to do something incorrect [illegible] these three analyses, there were only 8 findings [illegible] also all of those findings when the analysis [illegible] ed to resolve that issue, showed the analysis and the installations to be qualified as-built. In otherwords, they were not signicant qualifications and once again, every

one of these issues for SIF and valve modeling was readdressed by the project for work done on projects as well as by those consultants.

So, I guess our position is, that though there were some deficiencies found in Cygna's analysis at one point in time, the majority of work addressed on a generic basis and follow-up, and these findings do not support the conclusion that technical auditing should have been performed within Cygna's house as part of their program.

MR. NORTON: We have an omission. We tried, I shouldn't say tried, we omitted to try 16-1. We were going to do it before we started.

MR. DIURIARTE: Excuse me, Bruce. I think we've also overlooked Criterion 7, item 6.

MR. NORTON: You were supposed to have done that with 5 and 8(a) and (b) and 9.

MR. DIURIARTE: I think we went by it.

MR. NORTON: All right, well, let's do 16-1 first and then we'll come back to 7-6 very quickly, very briefly.

MR. OMAN: Item 16-1 concerns OPEG management was insensitive to problems reported to them which is in the transcript on page 23.

First of all, I'd like to reiterate that there are project procedures in the engineering manual which

established the mechanism for any engineer to bring potential problems to the attention of his supervision, specifically those procedures for discrepancy reports, procedure 10.1, a non-conformance report which is procedure 9.1. Therefore, there are procedures in place but I believe it's also recognized that communications both up and down within the OPEG organization could have been approved. I think that those improved communications would clearly have increased the awareness, overall awareness within the group of the small bore programs spoken objectives. I think it would have reduced the misunderstandings regarding the appropriateness of the approach that was being taken and that would have served to clarify points of technical concern that we have discussed at some length this afternoon.

I think we recognize that as Mr. Friend indicated at the outset, there was a slightly different approach one would take in qualifying an installed configuration as opposed to the approach one would take to do an initial design. That difference in basic approach in retrospect is somewhat unfamiliar or not completely clear to some members of our group. I think also that there were a number of what we believed to be acceptable analytical techniques which we used which in retrospect were also clearly not explained well enough and I think we touched on them as well today, the issues of joint release and the modeling of

gaps and analyses and other technical issues that have been the subject of recent discussion.

It's also clear that there was a very aggressive schedule within a small bore program in OPEG and that created very demanding work plans and it clearly led to some perceptions by some that were giving insufficient attention to the design adequacy. I also believe that there were clearly some personality conflicts in the group where very strong personalities held conflicting views on particular technical issues or problem areas.

In fairness, I think it's true that such disagreements don't necessarily indicate a problem, the fact that one is in disagreement with his supervisor doesn't necessarily indicate an insensitivity to the problem but without question, improved communications within OPEG definitely would have reduced the perception that problems were not being adequately addressed.

In summary, there are procedures in place to identify and bring problems to the attention of supervision. It is recognized that communications could have been improved and would have improved the process. I think it's fair to say that over the course of the last several months in reviewing these problems, there definitely is a heightened sensitivity in communication within OPEG. However, we also believe it's clear that the small bore

design acceptability has been adequately demonstrated.

MR. NORTON: I think the last --

MR. DIURIARTE: The last item there. The last item is Criterion 7, item 6; the observation is from the transcript on page 93. PG&E QA program audit of Westinghouse, number 20506, seismic reverification conducted on May 25 to 28, 1982 did not include a review of piping analysis and the pipe support calculation to ensure implementation of procedural requirements.

The question was raised when the audit of May '82 was reviewed, whether or not we had reviewed piping analysis, pipe support calculations and the auditors could not recall the two year old audit. They got out the audit and looked at the work that was documented as having been reviewed. It was not described as being related to any piping so they've written Westinghouse a letter quoting that portion of the audit report and asking for clarification.

Westinghouse responded on March 14, 1984 and stated that all of the analysis packages reviewed were related to large bore piping.

MR. HEISHMAN: I have one question that I think kind of falls into a number of the areas that we discussed today or maybe falls into none and that's what I want to try to determine. I'd like for someone to address in 50 words

or less if they can, how the IDVP program overlapped or came into the small bore or large bore or the kinds of problems that we're talking about today. What I'm really searching for is, that here we have some concerns that have been raised, we have an independent design reverification program that has gone on and I'm trying to determine if the two of them will help or make worse those things.

MR. NORTON: I think we can supply someone who can directly answer your question but I don't think there's a chance in the world that he'll do it in less than 50 words.

Can I now ask for Bob Cloud to speak?

MR. HEISHMAN: I'm sorry, Dr. Cloud, if I set you up for that.

DR. CLOUD: No problem at all.

MR. NORTON: That's six.

MR. CLOUD: As a matter of actual fact, I had not planned to speak today, but during the course of the meeting I've developed an increasing compunction to do so and had in fact within the last hour drafted out a couple of remarks because the events of the last several weeks do in fact have some implications for the IDVP effort. And so, I feel that it is appropriate to restate our point of view, even though not all the members of our team are here and even though the work was finished some time ago.

The fundamental philosophy of the IDVP was to develop and in that understanding of the basic overall quality of the engineering that was implemented at the Diablo Canyon Plant. And, we set about to do this as follows:

First, we performed a detailed review of the general design approach. We reviewed methodology, we reviewed criteria. We reviewed design procedures. Then, with that in mind, we verified point by point and in detail, samples of the work that was done to see that these general approaches were in fact implemented and we chose samples of the work according to our judgement and experience on what would be required to verify any given category of structures or components or piping.

In some areas which required individualized engineering, if you will, we took nearly 100% samples, for example, the buildings and some of the mechanical equipment.

In areas that were relatively homogenous, that is to say, where relative homogenous approach was applied to the equipment and, that would include piping, conduit supports and other classes of equipment. We took percentage wise a relatively small sample.

Now, from our detailed review of the sample, we were able to understand the level of implementation of the

general methodology. Now, I mentioned that we documented and evaluated all the discrepancies that we found and I believe that it is true that almost without exception, that all the categories of technical discrepancies that have been discussed in recent weeks and today were reported and discussed and evaluated by the IDVP. To improve the comprehensiveness of our understanding, we did point by point field verifications of portions of our sample. And further, to approve our assurance on the quality of the design, we expanded our sample in areas of weakness by issuance of generic EOIs, error in open items, that required DCP action and resolution. And in the case of small bore piping, a good example was the generic EOI on qualifications of vents and drains. And I believe this is especially signicant because as you probably know, field experience on fossil plants, refineries and so forth have shown that small bore welded steel piping is essentially impervious to the seismic hazard but the one weakness and perhaps the only field substantiated weakness is the connection of small pipes to large pipes and the IDVP focused on that.

At the end of the program, we took a completion program that verified the generic discrepancies were addressed and final design input was satisfactory.

And finally, the conclusion that we reached and

this was a joint concensus conclusion of the entire IDVP team, without dissent was that the design of the plant poses no threat to the health and safety of the problem. We believe the possibility exists even now, that there may be stress exceedences in localized situations, but we do not believe that they will be significant to safety.

Our conclusion is based upon the in-depth understanding that our team developed of the overall engineering approach and the verification of the implementation of those approaches through our sampling procedures.

///

MR. CLOUD: I only want to add two additional points. When the job was completely finished, the NRC staff required that two additional piping analyses of piping stressed systems be verified independently. And we did that and they were found to be acceptable.

And, finally, in the recent time frame as it has been reported today and elsewhere, the DCP has been analyzed a greate number of typing systems and supports, and has found no modifications to be required. And we feel that this work further substantiates IDVP conclusion. And that was the end of what I had to say. I'm -- I don't know if -- addresses your question or not. That's basically the interaction.

MR. HEISHMAN: Yes, I thank you. I think perhaps I should say that I had no idea when I asked the question that he had a prepared response. But, not withstanding, taht's fine. he answered the question and I thank him.

MR. TAYLOR: Just for my information, when you mentioned two highly stressed piping systems you reviewed the analyses for, were these large broe or small bore?

MR. CLOUD: These were large bore pipes.

MR. NORTON: Could you also tell when that review was? When that was completed?

MR. CLOUD: That review was done after the analyses of DCP was complete, I thought. Anyway, those analyses were complete and it was done in the month of December, January

and February just past.

MR. VOLLMER: Okay. Let's -- let me call for any further questions from the panel or whatever we are here.

MR. MANOLI: Just one further question on the interfaces, not the load interfaces but the systems interfaces between Westinghouse design piping and PG & E design. Design and pressure interfaces --

MR. CLOUD: Pressure?

MR. MANOLI: Pressure and tempature interfaces. Has that area been looked at? Because this was a recent problem, I think Bechtel realizes that, between Bechtel and -- the Sylvania Power and Light in the on sociskarinia (ph) 1 and 2. And there was like 150 findings of discrepancies in tempature and pressure between the two systems. And, we'd like to know if this been looked at?

MR. CLOUD: We developed a document called Design Criteria Memorandum Number 46. And in that document we have identified every safety related pipe in the plant and we've identified all modes for that pipe and the pressures and tempatures that correspond to those modes of operation

And that document is distributed in a control return receipt required fashion with Westinghouse and all other consultants and also OPEG and within disciplines in the office.

The document was generated jointly by the mechanical systems engineering effort or group as well as piping systems.

Dave Tadeosean, sitting to my right, was the coordinator and leader for that effort. And a tremendous amount of effort did go into that and it was subjected to a number of revisions. And all those revisions were transmitted. There were systems in place which assured that the revisions were reviewed and addressed to assure that every analysis that was impacted by the change was documented to be acceptable.

It's been a very thorough process.

MR. MANOLI: Yes.

MR. VOLLMER: Okay. At the beginning I said I would call for statements for people representing specific parties to this meeting that wanted to make them. But first, I would like to, before I go to that, ask if Mr. Yin has any further comments that he'd like to make?

MR. YIN: Well, since my draft report had yet distribute to all parties, so, there is a possibility that you may address the observation but not directly address the specific points that we were making in the report. So, we will be looking at the -- well, we're hopeful that the preliminary report will make public so we can all pick from side to side and compare notes.

MR. VOLLMER: Thank you, Isa.

Hans, are there individuals wishing to make brief statements?

MR. SCHIERLING: Yes. You mentioned you wanted

to say something Joel.

MR. REYNOLDS: Yes. I'm -- my name is Joel Reynolds and I'm an attorney with the Center for Law in the Public Interest, which represents the joint intervenor.

I have, essentially, one comment to make generally. Hearing form me after this long day isn't going to be of much use to the staff in creating a full record. I think what need s to be done is for the staff to get back to Mr. Yin and also to the allegers whose allegations essentially gave rise to the staff's investigation. I know that the government accountability project, and we have for sometime been trying to get the staff to meet with Mr. Stokes to get his replies and PG & E's response. Our efforts today have been very to date have been very unsuccessful. In fact, we were told today, I believe by Mr, Knigh., that the staff was not going to have time to meet with Mr. Stokes this week to get his reply to some of the information that we've heard today.

It seems to me, given the fact that the ACRS is scheduled to meet on Friday, that is a serious omission in the record that the staff is preparing for their review. As important as it is to get PG & E's response to the allegations and to the findings by Mr. Yin, we believe that it is equally important that you get back to the people have first hand knowledge which may contridict what we've heard today.

It is often in the case of the proceeding that PG & E disagrees factually with what we believe is the case. Particularily in this instance where there is a lot of hard evidence of continuing problems, it is very, very important to get a full record before going back to the Commission for a licensing decision.

We disagree, obviously, with some of the things we've heard today regarding the lack of significance of the information. Anytime you have errors in 95% of the calculation factors reviewed, that has to be significant.

Anytime you have continuing breakdowns in the quality assurance program that leads to those kind of calculation errors, we believe that is significant as well.

There are training deficiencies. There are unanswered questions in the area of large bore piping.

All these areas, sort of off the top of my head, we believe need to be reviewed. And the best way to do that is to get back, in a timely fashion, namely this week, to meet with people like Mr. Stokes who can reply to the information that you've gathered today.

That's really all I have to say at this time.

Thank you.

MR. VOLLMER: Hans? Did anybody else wish to --

MR. HUBBARD: Thanks Hans.

I'm Richard Hubbard. I represent the Attorney General's

here today, who represents the Govenor of the state of California.

We will submit our comments to you in writing. But, since I know that the NRC special group is here on a fast track, I would like to share a couple thoughts with you.

One is, I don't think you should look at these particular items identified by Mr. Yin in a vaccum. I think you have to look at what has gone on before.

For example, in the area of training there are a number of previous reports which talk about lack of indoctrination and training of Diablo Canyin personnel. The QA lookback review has information in that area. That is particular true, I think of concern in this particular case. Because as I understand it, OPEG used a number of job shoppers in their particular activity. So, this is not like Bechtel people who are normally familiar with the Bechtel system. So, I think, you know, there has been a generic problem with training over the years. And particularily in terms of the OPEG, we need to look at the 50% job shoppers in that particular group relevant to training.

Second, having to do with corrective action, criteria 16, I can remember Bob Falk and I out there about two and a half years ago looking at audit PG & E did of John Blum. It said John Blum didn't have a QA program. So, my feeling has always been that the PG & E QA people have done a good job identifying problems. If you go back over the years,

they can show they've identified almost every problem that we've -- that we've discussed here today and at other times.

However, I think that you're on the right track in looking to see if in fact the problems were really corrected.

Third area to do with document control. During the recent hearings at Diablo Canyon, we looked at one audit done by Mr. Ralston, I believe, where 50% of the manuals were not properly controlled. And I would recall Mr. Ralston said how can we have a QA program or how can we say we have one with this problem. So, you can't look at that in a vaccum.

In terms of audits themselves, in my experience in maybe three types of audits, there is a program audit to see if the program is really in accordance with the Regulatory and FSAR commitments. That's one type of audit.

The second type, would be what I call process audit to see if the proceedures that have been developed are in fact being implemented.

And a third, is what I'd call product audit. You go taste the pudding and see how good it is. By that sort of thing in an incoming inspection you might rerun materials certs to see that if in fact the certifications that you're getting from the vendors are valid.

In terms of design drawings, you might take a sample of those design drawings and rerun the calculations associated with them .

In terms of things like welding in non-destructive examination procedures, you might go ahead and take a sample of the product accepted and see if in fact, you know, they met all the requisite criteria.

So, I think an audit program should address all those factors. And then, finally, I think that you really have four charges or four things that you need to be concerned about.

One is, what does this say about the DCP QA programs? The items identified by Mr. Yin.

Second, what does it say about the adequacy of the IDVP? Because the IDVP did identify a lot of small problems in small bore piping. Though, in their opinion, not significant.

Third is, I think, once you get beyond the process, you have to say, how good is the pudding? I think the PG & E people have an important point when they say inspite of these process problems, the pudding tastes pretty good.
So, I think you have to address that but, you have to have evidence that goes to that. You know, I would hope that you'd really try to develop more evidence on the quality of the product. But, that is, in essence, what we're all interested in.

And then, finally, there is the question; can some of these modifications and design analyses be done after plant operation? And I would think rather than the question

be can it be done, the question is should it be done.

Thank you very much for the opportunity to be here today. And I'd like to complement the people at PG & E, and Bechtel and Westinghouse, who have obviously done a lot of work to put together these answers.

MR. VOLLMER: Thank you Dick.

Okay. You stole my thunder a little bit, Dick.

Again, indicate we cetainly appreciate your appreciation. Both PG & E and Bechtel. Bob Cloud, Roger Reedy and others of Westinghouse as well as parties such as Dick Hubbard, Joel Reynolds and certainly Isa for coming out. Thank you very much. It certainly has made -- given us a chance, at least, of doing our job by Friday. And giving our report to ACRS. And I will conclude the meeting.

Thank you.

(Whereupon, the meeting was concluded at 6:35 p.m.)

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

MAR 30 1984

Docket Nos.: 50-275/323

MEMORANDUM FOR: George W. Knighton, Chief, Licensing Branch No. 3, DL

FROM: H. Schierling, Project Manager, Licensing Branch No. 3, DL

SUBJECT: MEETING WITH PACIFIC GAS & ELECTRIC COMPANY ON DIABLO CANYON

DATE & TIME: Monday, April 2, 1984
9:00 am - 5:00 pm

LOCATION: Sheraton Palace Hotel
California Room
639 Market Street
San Francisco, California

PURPOSE: To discuss with PG&E responses to concerns by Mr. I. Yin raised at the meeting on March 28, 1984. Note: A transcript of this meeting will be taken.

PARTICIPANTS: NRC Staff

R. Vollmer, J. Taylor, R. Bosnak, R. Heishman, J. Knight
K. Manoly, J. Milhoan, B. Saffel, H. Schierling, T. Sullivan,
I. Yin

PG&E

H. Friend, L. Shipley, et al.

Hans Schierling

Hans Schierling, Project Manager
Licensing Branch No. 3
Division of Licensing

cc: See next page

Meeting between NRC technical staff and applicants for licenses are open for interested members of the public, petitioners, intervenors, or other parties to attend as observers pursuant to "Open Meeting Statement of NRC Staff Policy", 43 Federal Register 28058, 6/28/78.

April 2, 1984 Meeting

Agenda

I.	Introductory Remarks	NRC Staff
II.	PGandE Response to Items from Transcript of March 28, 1984 Meeting	Diablo Canyon Project*
	Overview	
	Criterion II, Items 1-2	
	Criterion XVI, Items 1-7	
	Criterion VI, Items 1-4	
	Criterion V-A, Items 1-6	
	Criterion V-B, Items 1-4	
	Criterion III, Items 1-8	
	Criterion XVIII, Items 1-7	
	Criterion VII, Items 1-9	
III.	Closing Comments	NRC Staff

*Project Panel

R. L. Cloud (IDVP)
T. G. DeUriarte (PGandE)
M. J. Jacobson (DCP)
E. R. Kahler (PGandE)
R. Oman (DCP)
L. E. Shipley (DCP)
D. C. Tateosian (DCP)
M. R. Tresler (DCP)

0759d

NRC/DCP PRESENTATION

April 2, 1984

Sheraton Palace Hotel
San Francisco, CA

Item	Description	Panel Member
II-1	Training Time	ERKahler
II-2	Procedure Changes	ERKahler
XVI-1	QPEG Management Insensitivity	ROman
XVI-2/3	Timely Correction/Management Attention	TGDeUriarte
XVI-4	Delayed Corrections	MJJacobson
XVI-5	Audit Followup	TGDeUriarte
XVI-6	Audit Closure	MJJacobson
XVI-7	Management Attention to Audits	TGDeUriarte
VI-1	Out-of-Date Procedures	ERKahler
VI-2	IOMs	ERKahler
VI-3	Procedure Listings	ERKahler
VI-4	Design With Out-of-Date Procedures	ROman
V-A-1	Field DP Procedure	MRTresler
V-A-2	Gaps	LEShipley
V-A-3	Stress Walkdown	LEShipley
V-A-4	Joint Releases	LEShipley
V-A-5	Quick Fix	ROman
V-A-6	Outside Reference	ERKahler

0759d

Item	Description	Panel Member
V-B-1	Input Checking	ERKahler
V-B-2	Personnel Training	ERKahler
V-B-3	Ident on Preliminary Hanger Calc	LEShipley
V-B-4	Stress Walkdown Inspection (New)	LEShipley
III-1	20-33Hz	LEShipley
III-2	As-Built Quick Fix (TC)	ROman
III-3	Telephone Info	ERKahler
III-4	Close Spaced Supports/Anchors	LEShipley
III-5	Snubbers	LEShipley
III-6	Snubbers - ALARA	MRTresler
III-7	OPEG Stress/Support Interface	LEShipley
III-8	LB Design Control (TC)	ROman
XVIII-1	Followup Audit Plan	TGDeUriarte
XVIII-2	Audit Closure Material	MJJacobson
XVIII-3	Audit Review Material	TGDeUriarte
XVIII-4	Input Checking	MJJacobson
XVIII-5	DR Procedures	MJJacobson
XVIII-6	OPEG Procedure Control	MJJacobson
XVIII-7	Checklist Change	MJJacobson
VII-1	PGandE/Westinghouse Interface	MRTresler
VII-2	Contractor Procedure Control	ERKahler
VII-3	Technical Audits	MJJacobson

Item	Description	Panel Member
VII-4	Contractor Internal Procedures	MJJacobson
VII-5	Audit of Westinghouse	TGDeUriarte
VII-6	May 25, 1982 Audits	TGDeUriarte
VII-7	Cygna	MRTresler
VII-8a	Westinghouse Audits	TGDeUriarte
VII-8b	Westinghouse Audit Records	TGDeUriarte
VII-9	Internal Westinghouse Audits	TGDeUriarte

NRC / PG&E
Meeting April 2, 1984
San Francisco Ca

Name	Company
George Sarkisian	PG&E
CHARLES O. COFFER	PG&E
George C. Lu	PG&E
Thomas A. Scarduzio Jr	Morton, Burke, Barey & Enoch, P.C.
EDWARD M. BURNS	WESTINGHOUSE
Bruce W Churchill	Shaw, Pittman, Potts & Trowbridge
Philip A. CRANE, JR	PG and E
CHARLES W. DICK	BECHTEL
DAVID H RAWLINS	Westinghouse
JOHN C. HOEBEL	WESTINGHOUSE
GREG W. HEGGLI	PGandE
Paul Burgess	"
SM SKIDMORE	PG&E
J.D. WOESSNER	PG&E
D. N. ALSING	WESTINGHOUSE
T.C. ESSELMAN	WESTINGHOUSE
D.B. HARDIE	BECHTEL
M. E. LEPPKE	PG&E
DANIEL V. CURTIS	BECHTEL
R.C. Anderson	Bechtel
D. K. Davis	TERA
[illegible]	
J.A Schuyler	P. G. & E.
D.A. BRAND	PG+E
R.F. LOCKE	PG&E
J.B. Hoch	Diablo Canyon Project PG&E

NAME	Company
STEVE M. DAVIS	KGO-TV
Isa J. Yin	NRC - R III
Dan Brand	PG&E
Jim Rocca	P.G.+E
Mike COLLINS	KRON-TV
Jim Bell	KTVU
Richard Hubbard	MHB - City attorney Ben's office
Edward Denison	Robert L. Cloud Assoc
CHARLES BROWNE	ROBERT L. CLOUD ASSOC.
Stanley L. Chin	Teledyne Engineering Services
William Van Meter	Self
H. LILLIGH	BECHTEL
W S Gibbons	RFR
R.F. REEDY	RFR REEDY, INC
H.B. NORRIS	RF REEDY, INC
Richard Harris	S.F. Examiner
Charles C. Stokes	Self
C. E. Ralston	PG&E
R.R. Fray	PG&E
Eric van Stijgeren	Ogena
DAN LUBOCK	PG&E
J.R. Reynolds	CLIPI
J. DiNozza	Westinghouse Electric
Vice President	SF Chronicle
Rita [illegible]	Ch. 2 KTVU-TV
JOHN ROSS	BOB GORMAN

(3)

NRC / PG&E Meeting April 2, 84
San Francisco

R. Vollmer	NRC / NRR
J. Knight	"
R. Bosnak	"
T. Sullivan	"
H. Schierling	"
J. Taylor	NRC / IE
R. Heishman	"
D. Allison	"
R. Faulkenberry	NRC / RV
K. Manoli	NRC / RI
B. Seffell	NRC Consultant
I Yin	NRC / RIII
G. Maneatis	PG&E
D Norton	PG&E / Attorney
H. Friend	~~PG~~ Bechtel
R Oman	PG&E / Diablo Canyon Project
L. Shipley	"
M. Tressler	"
D. Tateosian	"
T. Di Uriate	"
E Kahler	"
M. Jacobsen	"
R. Cloud	RLCA / IDVP
B. Lew	PG&E
Richard Devin	"

(4)

SUPPLEMENTAL SIGN-UP APRIL 2 MEETING

Thomas Divine

Anonymous