

NUCLEAR REGULATORY COMMISSION

ORIGINAL

COMMISSION MEETING

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In the Matter of: PUBLIC MEETING

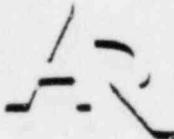
COMMENTS FROM PARTIES ON PHASE II  
REVERIFICATION PROGRAM FOR DIABLO CANYON

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

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
  
COMMENTS FROM PARTIES ON PHASE II  
REVERIFICATION PROGRAM FOR DIABLO CANYON  
  
PUBLIC MEETING

Nuclear Regulatory Commission  
Room 1130  
1717 H Street, N. W.  
Washington, D. C.

Wednesday, November 10, 1982

The Commission convened, pursuant to notice,  
at 1:05 a.m.

COMMISSIONERS PRESENT:

- NUNZIO PALLADINO, Chairman of the Commission
- VICTOR GILINSKY, Commissioner
- JOHN AHEARNE, Commissioner
- THOMAS ROBERTS, Commissioner
- JAMES ASSELSTINE, Commissioner

STAFF AND PRESENTERS SEATED AT COMMISSION TABLE:

- S. CHILK
- M. MALSCH
- C. ROTHSCHILD
- R. PARRIS
- J. ZERBE
- G. MANEATIS
- H. FRIEND
- B. NORTON
- H. BROWN
- A. DYNNEP
- R. HUBBARD
- D. FLEISCHAKER
- J. REYNOLDS
- G. ROESETT

DISCLAIMER

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1 require Phase II to be sufficiently completed prior to  
2 the decision on fuel loading and low-power test to  
3 provide confidence that no major plant deficiencies  
4 exist. We will be interested in the parties' comments  
5 on the staff's approach.

6           Also, at the October 20 briefing the NRC staff  
7 reported on the overall results to date from the design  
8 reverification program. In addition, the staff reported  
9 on the actions of the licensee in connection with the  
10 internal technical program for that plant.

11           I will not try to summarize the results and  
12 actions. However, the parties should feel free to  
13 comment today on this aspect of the staff position to  
14 the extent they see fit.

15           We have allotted 20 minutes apiece for the  
16 direction presentations of the licensee, Governor Brown  
17 and the joint intervenors. I understand that the  
18 representatives of Governor Brown and the joint  
19 intervenors wish to make a joint presentation. I  
20 welcome that approach in the hope that it will save time  
21 for more Commissioner questions. However, if the joint  
22 presentation extends the full 40 minutes, then I would  
23 expect that Commissioners will wish to ask questions  
24 during the presentation.

25           If the Commissioners have no further comments

1 at this time, I will ask the representatives of the PG&E  
2 company to proceed.

3 MR. MENEATIS: Thank you, Mr. Chairman.

4 My name is George Meneatis and I am Executive  
5 Vice President of Facilities and Electric Resources  
6 Development for Pacific Gas and Electric Company.  
7 Accompanying me today are Howard Friend of Bechtel, the  
8 Diablo Canyon Project Completion Manager and Bruce  
9 Norton, a licensing attorney.

10 It is a pleasure for me and my colleagues to  
11 be here today and to have the opportunity to present  
12 Pacific Gas and Electric Company's response to the Phase  
13 II program recommended to the Commission by the staff on  
14 October the 20th, 1982.

15 Our presentation today will be in two parts.  
16 I will begin with some brief introductory remarks and  
17 general observations on our Diablo Canyon review and  
18 corrective action program. Howard Friend will follow  
19 with a detailed response to the staff's expanded Phase  
20 II proposal made to the Commission on October 20th.

21 Let me say at the outset that we support the  
22 Phase II program as recommended by the staff and believe  
23 it to be fully responsive to the Commission's order of  
24 November the 19th mandating an independent review of  
25 Diablo Canyon Nuclear Power Plant.

1           The extensive review and verification of  
2 Diablo Canyon underway since the discovery of the  
3 original diagram error in September of 1981 is  
4 unprecedented in scope and thoroughness. Several  
5 detailed investigations involving over a thousand  
6 professionals are currently underway. I would like to  
7 highlight the more important of these investigations.

8           First is Pacific Gas and Electric Company's  
9 extensive internal technical program being undertaken  
10 jointly with the Bechtel Power Corporation and U.R.S.  
11 Blume Corporation. This review effort was accurately  
12 described to you by the NRC staff.

13           Engaged full time on the internal technical  
14 program are approximately 1,000 engineers and technical  
15 support people in the San Francisco Project Office and  
16 at the Diablo Canyon site. This does not include the  
17 construction workers at the Diablo Canyon site.

18           PG&E's internal technical program has carried  
19 the design review and verification effort well beyond  
20 the requirements of the Commission's order of November  
21 the 19th. This is perhaps best illustrated by PG&E's  
22 commitment to conduct a complete seismic review of the  
23 plant's safety related structures, systems and  
24 components to assure the adequacy of the plant's seismic  
25 design.

1           We believe the seismic verification program  
2 now nearing completion is by far the most thorough  
3 verification of seismic design ever undertaken at a  
4 nuclear power plant. We also voluntarily implemented a  
5 construction quality assurance review to assure the  
6 adequacy of construction although we had no reason to  
7 question the quality of our construction activities.

8           Nevertheless, we proceeded with a thorough  
9 construction quality assurance review to allay public  
10 concerns and demonstrate to the Commission that the  
11 plant was constructed according to its licensing  
12 commitments.

13           Separate and apart from the PG&E internal  
14 technical program is the independent design verification  
15 program initiated pursuant to the Commission's order.  
16 This effort is proceeding under the overall program  
17 management of Dr. Cooper of Teledyne Engineering  
18 Services who, as you know, reports directly to Mr.  
19 Denton and myself.

20           Associated with and reporting to Teledyne in  
21 this independent review effort are Robert L. Cloud  
22 Associates, which is performing a detailed seismic  
23 review of the plant and selected systems, R. F. Reedy,  
24 Incorporated, which is conducting an extensive review of  
25 the quality assurance programs and procedures employed

1 by PG&E and its service related contractors, and Stone  
2 and Webster Engineering Corporation, which is conducting  
3 the Phase II design review and the construction quality  
4 assurance review.

5 To date the Teledyne, Stone and Webster, Cloud  
6 and Reedy organizations, which have the equivalent of  
7 approximately 100 professionals working on this project,  
8 have expended over 100,000 man-hours in carrying out  
9 their verification responsibilities.

10 To my knowledge, this is the most  
11 comprehensive plant review of its type in the history of  
12 the NRC. The design verification being conducted by the  
13 independent design verification program or the IDVP as  
14 it has come to be called is as detailed and thorough as  
15 I have never encountered in over 30 years of engineering  
16 practice.

17 As Mr. Denton indicated in his October 20  
18 briefing, I have personally led the Diablo Canyon  
19 recovery efforts since the discovery of the original  
20 diagram error in September of 1981. The work involved  
21 in this undertaking has occupied the major portion of my  
22 time and brought me into intimate contact with many  
23 talented people associated with the Diablo Canyon  
24 project.

25 In programming our review and recovery efforts

1 we have had to accommodate the interests and concerns of  
2 a number of parties. The experience gained from dealing  
3 with these interested concerns has been very valuable  
4 and educational and should better position us to meet  
5 our responsibilities in the future.

6 I would like now to share with you some  
7 general observations regarding Diablo Canyon which I  
8 feel might give you a better perspective from which to  
9 judge the matters currently pending before you.

10 Diablo Canyon Power Plant has been in the  
11 design and construction phase for 16 years. I can think  
12 of no energy project which has been under development  
13 for so many years. During this protracted period of  
14 design and construction our efforts to complete the  
15 plant and bring it into commercial operation were  
16 adversely impacted by a number of unexpected  
17 developments.

18 Perhaps the most significant was the discovery  
19 of the Hosgri Fault which necessitated a seismic  
20 redesign of the plant. Later the plant was caught in  
21 the aftermath of Three Mile Island and required  
22 substantial retrofitting to meet new regulatory  
23 requirements.

24 During this extended period the state of the  
25 art in the practice of engineering evolved

1 significantly. Computers revolutionized the design  
2 process and made possible analyses of considerable  
3 sophistication and precision. More importantly, it  
4 shifted the practice of design engineering from methods  
5 involving significant engineering judgment to methods  
6 requiring precise computer analysis.

7           Four years after work on Diablo Canyon began  
8 the Nuclear Regulatory Commission promulgated Appendix B  
9 10 C.F.R. 50 quality assurance requirements which were  
10 subsequently imposed on the project. This necessitated  
11 further tailoring of the design and construction process  
12 to incorporate and implement new quality assurance  
13 requirements.

14           During the early 70's these evolving  
15 requirements were not fully, were not being uniformly  
16 interpreted by the industry and as a result the  
17 Commission and industry organizations were required to  
18 issue amplified constructions. Compounding the  
19 difficulty of the Diablo Canyon designers and its  
20 service contractors were changing design requirements,  
21 particularly in the seismic area. Mr. Denton accurately  
22 alluded to these in his October 20 briefing.

23           In retrospect perhaps we underestimated the  
24 challenge ahead of us when we elected to design and  
25 built Diablo Canyon in 1966. While Diablo Canyon was

1 our first major nuclear project, we were confident we  
2 could design and build a plant to the demanding  
3 requirements of the Nuclear Regulatory Commission based  
4 on our extensive experience with Vallecitos and Apple  
5 Bay nuclear facilities.

6           This confidence was further supported by the  
7 knowledge that we had successfully design and  
8 constructed some of the most advanced and complex energy  
9 projects in the nation, including numerous  
10 hydroelectric, steam generating, geothermal and major  
11 high voltage transmission facilities.

12           Despite the setbacks recently experienced, we  
13 believe as a result of the comprehensive review and  
14 verification effort underway we can complete the plant  
15 and demonstrate that it meets all applicable licensing  
16 requirements to the satisfaction of the Nuclear  
17 Regulatory Commission, the public and our independent  
18 auditors.

19           We regret, however, any inconvenience or  
20 embarrassment we may have caused the Commission and the  
21 NRC staff as a result of the problems we identified at  
22 Diablo Canyon following the issuance of this low-power  
23 license. As I said earlier, we believe we have  
24 benefitted greatly from the lessons learned from this  
25 unexpected event.

1           At this point, unless there are any questions,  
2 I will ask Howard Friend, the Project Completion Manager  
3 of Diablo Canyon, to present a detailed response to the  
4 staff's expanded Phase II proposal to the Commission.

5           CHAIRMAN PALLADINO: May I just ask one  
6 question. We just got a piece of paper that I haven't  
7 had a chance to read, but my attention was drawn to the  
8 fact that even though you said you support the staff  
9 plan, in the body of the report it seems to set forth a  
10 different plan. Is that going to be covered?

11           MR. MENEATIS: That will be covered and it is  
12 not that different. I think it is comparable.

13           CHAIRMAN PALLADINO: Well, it sounds like it  
14 is different.

15           MR. MENEATIS: Howard.

16           MR. FRIEND: Thank you, George.

17           I would like to reiterate that PG&E is in  
18 agreement with the recommendations of the staff on the  
19 Phase II program plan and the requirements for  
20 restoration and issuance of the low-power and full-power  
21 licenses.

22           PG&E also agrees with the staff's  
23 characterization of the status of the findings of the  
24 Phase I and Phase II programs. Pursuant to the staff's  
25 recommendations for licensing we request that the

1 Commission adopt a step-wise licensing schedule for fuel  
2 loading, low-power testing and full-power licensing.  
3 This process will provide sufficient flexibility to  
4 complete the remaining work by PG&E, the IDVP and the  
5 staff without unnecessary delay.

6 I would like to spend a few minutes talking  
7 about the status of our verification activities and the  
8 findings to date.

9 The Phase I efforts related to seismic design  
10 are nearly complete. PG&E's efforts have been  
11 documented in its Phase I final report which has been  
12 and continues to be submitted in installments since  
13 September 1st, 1982. This report describes the seismic  
14 reanalysis, including scope, criteria, methodology,  
15 analysis results and pertains to the various structures,  
16 systems and components that are involved in seismic  
17 related activities.

18 The findings related to the seismic design are  
19 being addressed and resolved by the PG&E corrective  
20 action program. These corrective actions as required by  
21 the Phase I program plan will be verified by the IDVP  
22 and by the NRC staff.

23 The Phase II efforts concentrated on  
24 non-seismic design are nearing completion also.  
25 Although this effort has identified specific findings,

1 preliminary evaluations by the IDVP as stated by Dr.  
2 Cooper to the staff on October 19th have indicated that  
3 generic concerns similar to those in seismic design are  
4 not being found.

5           The construction quality assurance  
6 verification effort was voluntarily undertaken to  
7 provide added confidence in the adequacy of the plant's  
8 construction. Consistent with the NRC Region V  
9 recommendations, about 250 attributes of construction  
10 activities were selected for quality verification. A  
11 plan was developed to evaluate two of the major  
12 contractors QA programs and to sample various  
13 structures, equipment and contractor's records for  
14 documentary evidence of adherence to approved procedures  
15 as well as physical evidence of components with design  
16 intent.

17           The sample was specifically chosen to include  
18 the reactor coolant system pressure boundary and the  
19 containment structure, two of the major barriers that  
20 prevent radioactivity from reaching the environment.  
21 The construction quality assurance evaluations are  
22 nearing completion.

23           The potential findings to date are minor in  
24 nature and while are still being evaluated, they fall  
25 into three categories: potential findings that can be

1 resolved as additional information is located; minor  
2 documentation discrepancies that nevertheless meet the  
3 design requirements; and deviations from procedures or  
4 specifications without record of engineering concurrence.

5           None of the construction quality assurance  
6 findings to date appear to have any significant safety  
7 impact or to require significant plant modifications.  
8 In summary the seismic, non-seismic and construction  
9 quality assurance verification activities are nearing  
10 completion.

11           When the verification aspects of these  
12 programs are sufficiently complete and appropriate  
13 corrective actions for fuel loading are taken,  
14 reasonable assurance will exist that fuel load  
15 activities can proceed without any undue risk to the  
16 public health and safety.

17           I would like now to turn to our recommendations  
18 for a stepwise licensing schedule. If you would put on  
19 the first slide, please.

20           (Slide presentation.)

21           We have envisioned and recommend that the  
22 Commission adopt a three-step schedule which provides  
23 the flexibility for completing the remaining work by  
24 PG&E, the IDVP and the staff without any penalty in  
25 terms of unnecessary delay.

1           Specifically the steps would complete  
2 requirements to allow restoration of the low-power  
3 license and authority for loading fuel and cold system  
4 testing. Step B would complete the remaining  
5 requirements for initial criticality and low-power  
6 testing under the authority of the low-power license,  
7 and Step C would complete the requirements for the  
8 issuance of a full-power license.

9           COMMISSIONER GILINSKY: How much time do you  
10 see between Step A and Step C?

11           MR. FRIEND: We have studied that and it can  
12 be quite variable. We have looked at a number of recent  
13 PWR licensing activities ---

14           COMMISSIONER GILINSKY: Well, I guess what I  
15 am asking you is how long do you think it would take you  
16 to complete the requirements that would take you to Step  
17 C? In other words, what are you gaining by doing it in  
18 pieces?

19           MR. FRIEND: Yes, I understand your question.  
20 On our schedule we believe we gain approximately 40 days  
21 by breaking it into pieces. That is the time from the  
22 start of fuel loading to initial criticality we believe  
23 we can gain approximately 40 days.

24           Another matter of importance in our mind is  
25 several of the recent PWR plants that have done into

1 operation have taken as long as 20 weeks to get from  
2 fuel loading to criticality and we believe that it would  
3 be a very important time saving if we should encounter  
4 problems and resolve those problems in this kind of a  
5 time frame. So those are the kinds of extremes we are  
6 talking about.

7           COMMISSIONER GILINSKY: Well, but it would  
8 still be 40 days unless you ran into problems on the  
9 other side that developed.

10           MR. FRIEND: That is correct.

11           Oh, perhaps I did misunderstand you. I was  
12 talking about 40 days between Steps A and B.

13           COMMISSIONER GILINSKY: Well, that is  
14 interesting, too, and how far would it take you to get  
15 to C?

16           MR. FRIEND: Step C would entail all of the  
17 steps necessary to reach full power and the periodic  
18 testing up to that point. That would be several months,  
19 perhaps four months after Step B.

20           MR. MENEATIS: Commissioner, we have made a  
21 number of schedules and we are estimating about 155 days  
22 from the time of fuel load to the time of full power,  
23 assuming everything goes according to plant, but there  
24 are a lot of variances that can come into play.

25           COMMISSIONER GILINSKY: I think you are

1 addressing just the question of starting a plant up and  
2 getting it to full power.

3 MR. MENEATIS: Yes.

4 COMMISSIONER GILINSKY: You want to do this I  
5 presume because you don't think you are going to have  
6 the analyses and the various studies done that are  
7 required for Step C by the time that you would like to  
8 get to Step A.

9 MR. MENEATIS: Well, the reason why we are  
10 requesting this is that we will be able to undertake  
11 activities in parallel which have to be completed. If  
12 you will recall in the staff recommendations ---

13 COMMISSIONER GILINSKY: I understand that.  
14 What I am trying to understand is on the seismic side  
15 how much work is there between Step A and Step C in  
16 terms of effort and how long it would take?

17 MR. FRIEND: Well, perhaps ---

18 MR. MENEATIS: Can I respond to that.

19 MR. FRIEND: Go ahead.

20 MR. MENEATIS: From the seismic side, I would  
21 suspect that all of the seismic work, aside from those  
22 that we can agree with the staff can be deferred with  
23 regard to modifications that can be made during our  
24 full-power run, as it were, or maybe even before full  
25 power, it will all be completed, all that work will be

1 completed by the time we complete our low-power testing  
2 program. Most of it will be completed even before we  
3 load fuel according to our current schedule, but we are  
4 not talking about the modifications.

5 COMMISSIONER GILINSKY: Why don't you go on  
6 and perhaps it will become clearer.

7 CHAIRMAN PALLADINO: But do I understand that  
8 you are separating this work into that which you will do  
9 before you load fuel and that which you will do before  
10 you go to low-power testing at least between A and B?

11 MR. FRIEND: There are three distinct steps.

12 MR. MENEATIS: No, between A and C.

13 COMMISSIONER GILINSKY: Let's see, the first  
14 one is complete requirements to allow restoration of  
15 low-power license and authority for fuel load in cold  
16 system test. The only complete remaining requirements  
17 for initial criticality and low-power testing ---

18 MR. FRIEND: That would be the second step.

19 COMMISSIONER GILINSKY: But you are dividing  
20 that work?

21 MR. FRIEND: Yes, that is our proposal.

22 If I may have the next slide.

23 COMMISSIONER GILINSKY: I was trying to  
24 understand the essential difference between what the  
25 staff proposed and what you were proposing.

1           MR. FRIEND: The staff proposal of October  
2 20th included our steps A and B as a single step.

3           COMMISSIONER GILINSKY: Yes, that is right.  
4 That is the difference.

5           MR. FRIEND: I have a viewgraph that I can  
6 present in a few minutes that will compare the staff's  
7 proposal against the one that we are making today.

8           CHAIRMAN PALLADINO: Okay.

9           MR. FRIEND: May I have the second slide,  
10 please.

11           In support of Step A for the restoration of  
12 the low-power license, including authority to load fuel  
13 and conduct cold system testing, we would commit to the  
14 following reports, an IDVP Phase I and Phase II status  
15 report. If you will look at the asterisked item, the  
16 status reports would demonstrate that the activities are  
17 sufficiently complete to provide reasonable assurance  
18 that no major deficiencies remain undetected

19           I think this may address the question of how  
20 much seismic would be done. Enough seismic  
21 investigation would be done to assure that we had  
22 reasonable assurance that no major deficiencies remain  
23 undetected.

24           COMMISSIONER AHEARNE: Just to calibrate your  
25 terms, do you believe that there have been any major

1 deficiencies detected to date?

2 MR. FRIEND: We believe that we have detected  
3 discrepancies in meeting the licensing commitments for  
4 Diablo Canyon.

5 COMMISSIONER AHEARNE: But I am asking you  
6 about your words. You have introduced the phrase "major  
7 deficiency." So I am asking you to date have there been  
8 any major deficiencies detected?

9 MR. FRIEND: As you know, in our reports we  
10 have stated several times that it is belief that none of  
11 the items that have been detected to date would have  
12 caused the plant to fail to perform a safety function.

13 COMMISSIONER AHEARNE: You are jousting with  
14 me.

15 MR. FRIEND: I am not intentionally, sir.

16 COMMISSIONER AHEARNE: You put in a phrase.  
17 Your phrase is that the status reports would demonstrate  
18 that activities are sufficiently complete to provide  
19 reasonable assurance of something.

20 MR. FRIEND: Yes.

21 COMMISSIONER AHEARNE: Now that something is  
22 that no major deficiencies remain undetected. It is  
23 your phrase. It is not mine. You see what you are  
24 saying is the status report would give us reasonable  
25 assurance of something, and that something is that no

1 major deficiencies remain undetected.

2 MR. FRIEND: Yes.

3 COMMISSIONER GILINSKY: To make it a little  
4 more pointed, I think what Mr. Ahearne is asking you is  
5 if after this process you found another diagram error  
6 would that be considered to have been a -- what was the  
7 word -- a major deficiency?

8 MR. FRIEND: Yes, that would be considered as  
9 a major deficiency.

10 MR. MENEATIS: Another major deficiency, if I  
11 can respond to Mr. Ahearne on this, would be we reported  
12 a weight problem in the annulus area on November the 3rd  
13 at the meeting. That was a major deficiency in the  
14 sense that the weights in the annulus area were far  
15 greater than what the modelers have assumed them to be.

16 COMMISSIONER AHEARNE: So that from your  
17 standpoint there have been at least two major  
18 deficiencies so far. I am trying to get a calibration  
19 of what it is I would have reasonable assurance of at  
20 this stage because if neither of those items had fallen  
21 within the major deficiency, then I wasn't really sure  
22 what I would have assurance of. But if you are saying  
23 that both of those are major deficiencies, then I at  
24 least begin to get a calibration of what I would have  
25 reasonable assurance of.

1 MR. FRIEND: Those are the type of examples.

2 MR. MENEATIS: Those are examples that we can  
3 speak of.

4 COMMISSIONER AHEARNE: There are other major  
5 deficiencies.

6 MR. MENEATIS: Some of them have been  
7 identified as error of Class A's and error of Class  
8 A/B's. I speak of those kind of deficiencies.

9 MR. FRIEND: Yes, I think that is a good way  
10 to calibrate it. Perhaps some of the examples that you  
11 might reflect on are some of the errors that have been  
12 announced in the IDVP and in the PG&E internal program  
13 as the kinds of deficiencies we want to reach assurance  
14 no longer exist, that there are no more.

15 MR. MENEATIS: But to be clear on that point,  
16 if we were to discover something and it is all out in  
17 the open and we have analyzed it, the IDVP has analyzed  
18 it and the staff is aware of it and we have prescribed  
19 the solution to the problem, it may still be a major  
20 deficiency, but it will be a known quantity. Those are  
21 the sort of things we are talking about. We will have  
22 discovered all of those by that time.

23 MR. FRIEND: In addition, in support of the  
24 load fuel and conduct cold system testings, we would  
25 want status reports from the IDVP on the internal

1 technical program quality assurance program; that is,  
2 the quality assurance program that we presently have in  
3 place doing the corrective work.

4 We would want a status report on the  
5 construction quality assurance verification program that  
6 I spoke of earlier and on the as-built verification of  
7 any modifications that have been made. As I mentioned  
8 earlier, both the IDVP and the staff are reviewing  
9 modifications.

10 On our use of non-Hosgri spectra we would want  
11 final reports on the PG&E/Westinghouse interface and our  
12 use of the Hosgri spectra in our design activities.

13 We would issue our final Phase I report, which  
14 would be our report in response to the Phase I work.

15 We would want to complete obviously all the  
16 modifications for fuel load and cold system testings.

17 And, finally, we would want the NRC staff  
18 concurrence with these reports and modifications and the  
19 other work which we would say is necessary to support  
20 the fuel load and low-power testing.

21 COMMISSICNER GILINSKY: I wonder if I could  
22 ask my question again because we are getting into a lot  
23 of detail about the exact nature of your proposal.

24 Other things being equal, I would have to say  
25 that after all the problems we have had it would be good

1 to have everything done and completed before anything  
2 went forward. Now what is it that you are putting on  
3 the other side of the scales. What is the advantage of  
4 going in a step-wise fashion, and that is what I was  
5 trying to get at, how much time? What is your estimate?

6 MR. FRIEND: Perhaps as much as 20 weeks. If  
7 we go on the typical record of the last half a dozen or  
8 so PWRs that have gone into operation, we have averaged  
9 approximately 20 weeks between start of fuel loading and  
10 initial criticality and low-power testing.

11 COMMISSIONER GILINSKY: Again, you are going  
12 by the record of other reactors and the time it takes to  
13 start up. It seems to me what really matters is how  
14 long does it take you to complete the various things  
15 that have to be completed in Phase I and Phase II and  
16 satisfying all the other requirements. If you could do  
17 those instantly it wouldn't matter what how long it took  
18 a reactor to start up.

19 MR. FRIEND: That is correct.

20 COMMISSIONER GILINSKY: So that one ought to  
21 be look at and that is what I am trying to ask you. How  
22 long do you think that period is?

23 MR. FRIEND: It is somewhat difficult to  
24 respond and I will respond ultimately. Part of our  
25 problem is that we are knowledgeable that the Commission

1 has not yet approved the Phase II program and as  
2 recently as October 20th the staff has added some  
3 additional activities to the Phase II program. So it is  
4 difficult for us to come to grips precisely with the  
5 schedule requirements that will be involved with  
6 completing the work. That is a problem for us.

7           But based on the program as outlined by the  
8 staff last October 20th and the work that we have done  
9 to date in planning our activities and the problems that  
10 we have uncovered and the work that we have done in the  
11 corrective action program to correct them, we are  
12 currently aiming to have all the work necessary in  
13 support of fuel loading as we have depicted here toward  
14 the middle to the end of December. We have talked with  
15 the staff and the IDVP about their review efforts and  
16 considering perhaps a month for the IDVP to complete  
17 their review and report and then another approximately a  
18 month for the staff to complete their review of the IDVP  
19 program and our own work. We are talking about the end  
20 of February as a time scale for fuel loading in  
21 accordance with this kind of a schedule.

22           CHAIRMAN PALLADINO: Could I ask you with  
23 regard to your first Step A what is it that you are not  
24 doing that was on the staff's proposed fuel load,  
25 low-power decision table? I was trying to compare them

1 with what they were proposing and I thought I found  
2 every one you list here on their table, but I was trying  
3 to listen and look at that table, too.

4 MR. FRIEND: Can you put up a slide that  
5 compares the staff's recommendation against ours. I  
6 think it is nine maybe.

7 (At this point in the proceedings there were  
8 problems with the viewgraph machine.)

9 CHAIRMAN PALLADINO: The machine broke.

10 (Laughter.)

11 CHAIRMAN PALLADINO: Do you have any hard  
12 copies or do you have one we can make hard copies from?

13 MR. NORTON: We ought to talk about the QA  
14 program.

15 (Laughter.)

16 COMMISSIONER GILINSKY: That is the  
17 responsibility of the Secretary.

18 (Laughter.)

19 CHAIRMAN PALLADINO: Well, why don't you see  
20 what you can with what you have. Well, maybe you might  
21 go on and we can come back to that question.

22 MR. NORTON: Unfortunately though we are in  
23 the middle of the slides.

24 (At this point in the proceedings the  
25 viewgraph machine was fixed.)

1           CHAIRMAN PALLADINO: Let's go on.

2           MR. FRIEND: For Step B, which would be the  
3 step that would allow initial criticality and low-power  
4 testing, we would have from the IDVP their final final  
5 on all of the activities involved in Phase I and a  
6 status report on as-built verification of any  
7 modifications that we had to make in support of initial  
8 criticality and low-power testing.

9           Of course, on our part we would make all the  
10 modifications necessary for low-power testing and,  
11 finally, we would ask for the NRC staff's concurrence to  
12 proceed with initial criticality and low-power testing  
13 based on their review of the IDVP reports and our work.

14          CHAIRMAN PALLADINO: This may answer my  
15 question. Apparently one of the items is that we will  
16 have the final report and the other is a status report,  
17 whereas this was calling for a final report, a status  
18 report on as-built verification of modifications which I  
19 think was lumped in earlier with both the fuel loading  
20 and low power. Okay, I think I understand it.

21          MR. FRIEND: May I have the next slide, please.

22          Finally for Step C in our parlance the work  
23 required to support issuance of a full-power license, we  
24 would have IDVP reports on the Phase I final report,  
25 final reports on the internal technical QA program, the

1 construction quality assurance verification, the  
2 as-built verification of modifications and the final  
3 report on the use of non-Hosgri spectra.

4 For PG&E we would submit a Phase II final  
5 report which would document to the completion of our  
6 Phase II activities and we would complete any  
7 modifications required for full power.

8 And, finally, as with the previous steps, we  
9 would ask for staff concurrence with the above reports  
10 and information for us to proceed to full power.

11 CHAIRMAN PALLADINO: Now are you leaving  
12 anything off of the staff for going to full power? Are  
13 you leaving anything out of your program that was on the  
14 staff list?

15 MR. FRIEND: I don't believe so.

16 COMMISSIONER AHEARNE: Do you have a chart of  
17 some kind that does explicitly compare the staff ---

18 MR. FRIEND: Yes. Can you please put up the  
19 slide that compares the fuel load, low-power activities  
20 with our own activities.

21 COMMISSIONER AHEARNE: Could one of you  
22 gentlemen with a copy donate a copy of that slide.

23 (A copy of the slide was handed to  
24 Commissioner Ahearne.)

25 MR. FRIEND: Now in this slide the first

1 column are the requirements that were identified by the  
2 staff in their October 20th SECY paper that was  
3 presented here.

4           The second column are the requirements that we  
5 have established for fuel load.

6           The third column are the requirements for  
7 low-power testing.

8           COMMISSIONER AHEARNE: So your interpretation  
9 is that you have taken everything that they had  
10 recommended and separated it into the two?

11           MR. FRIEND: That is correct. In the  
12 aggregate we take no issue with the staff. We would  
13 meet all the staff's requirements. We have just taken a  
14 preliminary step to break the fuel load and low-power  
15 requirements into two.

16           CHAIRMAN PALLADINO: The item 4 that talks  
17 about modifications, are you dividing that into two  
18 parts for fuel loading and low power? You say complete  
19 in both cases.

20           MR. FRIEND: Yes, we would want to complete  
21 certain systems in support of fuel load and additional  
22 systems in support of low-power testing.

23           CHAIRMAN PALLADINO: So there would be partial  
24 complete?

25           MR. FRIEND: That is correct. I should also

1 add that the staff has not had an opportunity to review  
2 our proposals and we would of course seek their  
3 concurrence before seeking your total concurrence. We  
4 believe this is a program that would allow us to proceed  
5 expeditiously without any reservation about the quality  
6 of the work and the restoration of the facilities.

7 COMMISSIONER ROBERTS: Well is the first time  
8 the staff has had a chance to be exposed to this?

9 MR. FRIEND: This particular proposal, yes,  
10 sir, but it is very much in keeping we believe with  
11 their earlier recommendation on October 20th.

12 CHAIRMAN PALLADINO: This proposal is dated  
13 November 10th. Now if you would have had another column  
14 here that says prior to full power decision, would they  
15 coincide with the remaining items that the staff had? I  
16 think it would.

17 MR. FRIEND: Yes. Why don't you put on the  
18 slide that describes the full-power activities and the  
19 comparison between the staff's recommendation and our  
20 program.

21 MR. MENEATIS: If you will notice, if  
22 anything, the PG&E proposal requires final whereas the  
23 staff proposal required status in some areas. Otherwise  
24 they are equivalent.

25 MR. FRIEND: They are equivalent.

1           George, I think that summarizes our remarks,  
2 unless there are any other questions about it.

3           COMMISSIONER GILINSKY: The relevance of the  
4 40 days then was the difference between your proposal  
5 and how you interpret the staff proposal?

6           MR. FRIEND: That is correct, yes.

7           COMMISSIONER GILINSKY: Well, then is only 40  
8 days saved?

9           MR. FRIEND: That is what we are saying exists  
10 between the first two steps, Step A and Step B.

11          CHAIRMAN PALLADINO: Oh, I see. You do  
12 anticipate though that the time saving is the order of  
13 20 weeks?

14          MR. FRIEND: It may be on the order of 20  
15 weeks if we follow the pattern of the last half a dozen  
16 or so PWRs that were put into service.

17          COMMISSIONER ASSELSTINE: How long do you  
18 expect it will take to go from a status report on Phase  
19 I of the design verification program to the final report  
20 on Phase I? It looked to me when you put the other  
21 chart up that that was the principal difference between  
22 what the staff had proposed and what you are proposing,  
23 that before fuel loading instead of requiring a final  
24 report for Phase I that there would only be a status  
25 report. Am I right that that is the fundamental change?

1           MR. MENEATIS: That is the fundamental  
2 difference, yes.

3           COMMISSIONER ASSELSTINE: How long do you  
4 anticipate it would take to go from the status report  
5 point until you would be prepared to submit the final  
6 report on Phase I?

7           MR. MENEATIS: That report is beyond our  
8 control. It is an IDVP report and it is quite a bit  
9 dependent on their findings.

10          COMMISSIONER ASSELSTINE: But isn't that  
11 really the time saving that we are talking about here?

12          MR. MENEATIS: The premise behind our proposal  
13 would be that the status report would be a positive  
14 report and the IDVP would have to say that they do not  
15 expect to find any serious deficiencies in the remainder  
16 of their review, and I would anticipate that ---

17          COMMISSIONER ASSELSTINE: You think that can  
18 come in December? Is that what you said earlier?

19          MR. MENEATIS: December of early January. We  
20 expect to complete all of our work that the IDVP must  
21 review between mid- and late-December.

22          COMMISSIONER ASSELSTINE: Then there is a  
23 month to two months for ---

24          MR. MENEATIS: Yes, we allowed a month for the  
25 IDVP to make status reports and a month for the staff to

1 complete their review in our judgment.

2 COMMISSIONER ASSELSTINE: So what you are  
3 really talking about is at some point in February the  
4 status report on Phase I would have gone through your  
5 process, the outside review and the NRC staff review?

6 MR. FRIEND: That is correct.

7 CHAIRMAN PALLADINO: There is another place  
8 where there may be a difference and that is where you  
9 use the word "complete" because I am not sure that  
10 everywhere the word "complete" is used that it means the  
11 same thing.

12 COMMISSIONER ASSELSTINE: That could be, yes.

13 CHAIRMAN PALLADINO: I meant the modification  
14 being complete. Does the staff envision completion of  
15 the sum of the two when they say "complete" and you are  
16 dividing it into two parts.

17 MR. FRIEND: That is correct also.

18 CHAIRMAN PALLADINO: How much do you save by  
19 that and what is the down side of splitting it?

20 MR. FRIEND: Well, again, we believe that we  
21 are saving some amount of time by doing some of the work  
22 in parallel, that is, any corrective action that is not  
23 necessary for fuel load and any further evaluation that  
24 is not involved in fuel load but is necessary for the  
25 IDVP to complete their program. Those are the kinds of

1 savings that we envision. They range from, say, the 40  
2 days to 20 weeks perhaps.

3 COMMISSIONER AHEARNE: In the modification.

4 MR. FRIEND: No. What I was talking about is  
5 the difference between a very smooth, clean fuel loading  
6 and a fuel loading that has problems that need to be  
7 rectified before receiving criticality.

8 MR. MENEATIS: And, Howard, isn't there also a  
9 difference in Phase A and B as we called them in the  
10 modifications that we are going to say are going to have  
11 to be completed?

12 MR. FRIEND: Oh, yes.

13 MR. MENEATIS: Now those are going to be  
14 delineated to the satisfaction and they are going to  
15 approve them, but the modifications are different for  
16 cold system testing, to permit cold system testing, and  
17 others for criticality and low-power testing are  
18 different again.

19 Instead of saying that they are the same and  
20 we will go all the way to criticality, it is a broader  
21 step. We are just going to break those modifications up  
22 into a subset and they will be separately identified and  
23 they will be completed for each step. So there is  
24 another distinction and I think that is in the write-up.

25 COMMISSIONER AHEARNE: I realize you have been

1 over this several times and my apologies. It was a long  
2 trip back from Pennsylvania yesterday and I am not  
3 focusing as clearly as I would have preferred to.

4 (Laughter.)

5 COMMISSIONER AHEARNE: Let me make sure if I  
6 can to understand the time difference. By using your  
7 chart and looking at what must be done before low power  
8 the staff had recommended fuel load and low power one  
9 approval and you are separating it into two. So you  
10 would like approval to load the fuel and then putting  
11 off the approval to take that next step to low power.

12 The two differences are in the Phase I report,  
13 and the difference being a status report versus a final  
14 report, and then the modifications. The status report,  
15 is it correct as I understood what you said that PG&E's  
16 contribution and work for Phase I would have been  
17 completed both for the status report and for the final  
18 report, the submissions that you people were making?

19 MR. MENEATIS: Yes, they will have been  
20 completed by the end of the year.

21 COMMISSIONER ASSELSTINE: For both, for the  
22 final report as well as the status report?

23 MR. MENEATIS: Yes.

24 COMMISSIONER AHEARNE: Is that correct?

25 MR. FRIEND: Yes.

1 MR. MENEATIS: Yes. We are talking about the  
2 IDVP report which they can't write until they receive  
3 all of our material.

4 COMMISSIONER AHEARNE: And the difference  
5 between status and final is status is something that is  
6 a preliminary product based on initial review of what  
7 you have submitted?

8 MR. MENEATIS: It could be.

9 COMMISSIONER AHEARNE: Who would be submitting  
10 the status report?

11 MR. MENEATIS: The IDVP.

12 COMMISSIONER AHEARNE: They would be  
13 submitting the status report.

14 MR. MENEATIS: Teledyne Engineering.

15 MR. FRIEND: We would advise the IDVP that we  
16 felt that enough work had been done for them to reach  
17 the conclusion that there were no hidden discrepancies  
18 and we would ask them then to document that.

19 COMMISSIONER AHEARNE: But the material that  
20 PG&E would have submitted to the IDVP people is the  
21 same; is that correct?

22 MR. MENEATIS: That is correct.

23 COMMISSIONER AHEARNE: So what you are  
24 essentially saying is you are asking them for an  
25 additional report additional to what the staff has asked?

1 MR. MENEATIS: That is correct.

2 COMMISSIONER AHEARNE: And that you expect  
3 would save 40 days?

4 MR. MENEATIS: Or more.

5 COMMISSIONER AHEARNE: Have you talked to the  
6 IDVP people on the amount of time and preparation?  
7 Clearly if they reviewing something for the status, then  
8 they are not, unless they are going to also incorporate  
9 that as part of their review in the final report, there  
10 is a potential in this for delaying the final report as  
11 a result.

12 MR. FRIEND: There is that potential, yes.

13 MR. MENEATIS: Or it may help the final report.

14 COMMISSIONER AHEARNE: Okay, but it is  
15 somewhere in that 40-day period.

16 The 20 weeks that you are referred to as a  
17 possible savings comes about in these modifications and  
18 other problems that might show up in the fuel loading.

19 MR. MENEATIS: Yes, and to translate that into  
20 financial terms it is not insignificant. It is really a  
21 significant saving to the ratepayers of Northern  
22 California because it adds to the cost of the plant.

23 CHAIRMAN PALLADINO: Did you have any more  
24 formal presentation?

25 MR. MENEATIS: That is all we have.

1           COMMISSIONER AHEARNE: One final question.  
2 There has been no difference though between your  
3 approach and the staff's approach once the low-power  
4 approval has been given?

5           MR. MENEATIS: No difference whatsoever.

6           MR. FRIEND: That is correct.

7           COMMISSIONER GILINSKY: I have one question.  
8 There was presentation last time by a group from  
9 Brookhaven and I wonder if you have any comments or  
10 reactions on their presentation or on the significance  
11 of their findings?

12           MR. MENEATIS: I don't think we have any more  
13 comments than we have already put into the record,  
14 Commissioner Gilinsky. We have had two open items as  
15 was indicated by Dr. Cooper that came out of that  
16 particular study referred to the PG&E/Bechtel project  
17 team for resolution. We have to respond to those  
18 concerns raised by the IDVP as a result of the  
19 Brookhaven study, but we weren't surprised with what  
20 Brookhaven has come up with because we reported at our  
21 November the 3rd meeting that we were redoing the  
22 annulus area and that we had indicated the weight  
23 discrepancy, we talked about a more accurate model and  
24 that we were going to redo the vertical response  
25 method. So we weren't surprised that they indicated

1 some differences from our analysis.

2 COMMISSIONER GILINSKY: Thank you.

3 COMMISSIONER AHEARNE: While I was summarizing  
4 my notes here two other questions occurred to me.

5 On the 40 days, if you haven't talked to  
6 Teledyne, that has to be your estimate of the time that  
7 would be saved.

8 MR. FRIEND: Yes. It has to do with the  
9 physical work in the plant. We have talked to Teledyne  
10 somewhat and they have indicated that with approximately  
11 two weeks notice they could produce a status report for  
12 us at our request, and of course it is up to us to  
13 decide that we think enough investigation has gone  
14 forward to make that request.

15 COMMISSIONER AHEARNE: Have you made an  
16 estimate yet of details which you are ready to discuss  
17 with our staff of the modifications that would be put  
18 off under your step versus the staff's Step A and Step B  
19 combined?

20 MR. FRIEND: Let me put it the other way. We  
21 have identified the systems that we think are necessary  
22 to support Step A and Step B and we can have dialogue  
23 with the staff on those matters. We have said that we  
24 would modify as required each of those systems necessary  
25 to support Step A in accordance with its schedule and

1 Step B in accordance with its schedule.

2           COMMISSIONER AHEARNE: For example, let's say  
3 Mr. Eisenhut asked you do you have a set of  
4 modifications that you see you are going to have to make  
5 and it is this set over here that you would like to  
6 defer and it is because of the time it would take to  
7 make those modifications that you want to go ahead with  
8 Step A.

9           MR. MENEATIS: Can I respond to that,  
10 Commissioner. We have a partial set. We have not  
11 completed our analysis, as we have indicated, of these  
12 structures. That will be completed by the end of  
13 December or right around that time frame, or whenever it  
14 is. When that step is completed we will most certainly  
15 have the list delineated and it will be explicit and it  
16 will describe the modifications that fall into each  
17 category.

18           COMMISSIONER AHEARNE: The reason I was asking  
19 the question is the impression I got from the  
20 presentation was that the 20 weeks is solely based upon  
21 examination of what other PWRs have experienced and it  
22 is essentially you could then almost envision that if  
23 you drew a curve and plotted some data points and said,  
24 ah hah, it is roughly 20 weeks independent of any  
25 calculation that you have certain pieces of equipment or

1 modifications you want to make and you know it is going  
2 to take you a certain number of weeks.

3 MR. FRIEND: That is correct. Your perception  
4 is correct.

5 One final thing. We do advise Region V  
6 periodically of the changes in our modifications that  
7 are coming out of this program. So except for perhaps  
8 having the ability to identify specifically with the  
9 systems precisely, the staff does have a good  
10 understanding of what is going on.

11 CHAIRMAN PALLADINO: Any other questions?

12 (No response.)

13 CHAIRMAN PALLADINO: Well, thank you,  
14 gentlemen.

15 We will now have the joint intervenors and  
16 Governor Brown representatives join us at the table.

17 (At this point in the proceedings Messrs.  
18 Maneatis, Friend and Norton left the Commissioners'  
19 table and Messrs. Brown, Dynner, Hubbard, Fleischaker,  
20 Reynolds and Roesett joined the Commissioners at the  
21 table.)

22 CHAIRMAN PALLADINO: Who is going to be the  
23 principal spokesman?

24 MR. BROWN: I will start off. I am Herb Brown.

25 CHAIRMAN PALLADINO: Will you introduce the

1 others then?

2 MR. BROWN: I will, yes.

3 My name is Herbert Brown. I am counsel to the  
4 Governor of California who is representing the State of  
5 California in this proceeding. I am a partner in the  
6 law firm of Kirkpatrick, Lockhart, Hill, Christopher &  
7 Phillips here in Washington. To my left is a law  
8 partner of mine, Allen Roy Dynner. To my right is  
9 Richard D. Hubbard who is a consultant to the State who  
10 will be making a technical presentation. On his right  
11 is Dr. Jose Roesett, a professor at the University of  
12 Texas at Austin who will continue.

13 We appreciate the opportunity to consolidate  
14 the intervenors with us. It will save the Commission  
15 time and make the presentation more coherent I think,  
16 and I will let the intervenors speak for themselves.  
17 That is David Fleischaker and on his right is Joel  
18 Reynolds who are both attorneys for the intervenors.

19 What I would like to do is make a very brief,  
20 and I would presume it would be a five-minute  
21 introduction which tries to integrate a few thoughts I  
22 had as I listened to the PG&E presentation a few minutes  
23 ago and then Dick Hubbard will have a presentation of  
24 roughly 15 minutes and we have got a handout and some  
25 transparencies to put on the wall, followed by Dr.

1 Roesett who has roughly a 10-minute presentation. Both  
2 Mr. Hubbard's and Dr. Roesett's presentations are  
3 technical.

4 I just to start off quickly would say that the  
5 perspective of the status is somewhat different from  
6 that of the Pacific Gas and Electric Company to this  
7 extent. We would observe that any kind of problem that  
8 requires a thousand professionals and additional  
9 construction people to be one that deserves continuing  
10 caution and a great deal of attention and not any kind  
11 of program that would short-cut the process.

12 The phraseology that always rings clear in my  
13 own mind was that more than a year ago the Diablo plant  
14 was reputed to have been the best or more thoroughly  
15 analyzed plant in the history of the world and since  
16 that time it has even been a more thoroughly analyzed  
17 plant for the reason that some severe problems turned up.

18 The past year has been marked by two principal  
19 findings as we look upon the past year. The first is  
20 that there has been an evolutionary process, namely,  
21 problems have turned up as people have looked under more  
22 rocks. We might well remember a year ago, and I think  
23 literally a year ago this week, when the persons most  
24 intimately familiar with the problems at PG&E felt that  
25 they would indeed be limited to the annulus area of the

1 plant, and as the weeks moved forward and a more generic  
2 perspective developed and the nature of the problems had  
3 begun to show themselves as being something not only  
4 that transcended the annulus area of the plant but  
5 qualitatively it represented something different from  
6 what most people had in mind at that time.

7           The second lesson for us has been one of  
8 caution and particularly caution with words. It is we  
9 think imprudent for anyone to try to put finite limits  
10 on when Diablo is going to be ready for fuel loading.  
11 It should be more a qualitative determination based upon  
12 completing the program as one would deem that program to  
13 be technically prudent.

14           Whether it is 40 days that can be saved or  
15 purportedly a certain number of dollars for ratepayers,  
16 we deeply feel that those are considerations beyond the  
17 purview of what this Commission ought to consider  
18 pertinent. We would ask that the Commission concentrate  
19 its own attention on the technical soundness of when it  
20 feels it is prepared to consider whether or not to  
21 reissue the license.

22           One of the more stinging characterizations of  
23 the nature of where this Commission is going to be  
24 reasonably soon was put forth by Dr. Roesett when he  
25 made a brief presentation to Harold Denton and some of

1 his colleagues on the staff in San Francisco in  
2 September. Dr. Roesett mentioned that it probably would  
3 be intolerable for everyone concerned with Diablo  
4 Canyon, including this Commission, if the Commission  
5 were to reissue the license only to find two days later  
6 or two months later that there is another problem with  
7 the plant.

8 CHAIRMAN PALLADINO: That would be distressing.  
9 (Laughter.)

10 COMMISSIONER AHEARNE: Would you see any  
11 equivalent distress if we waited two years and did not  
12 find any problem and then let the plant start?

13 MR. ROESETT: If you waited two years I see  
14 some distress. I don't know if it is equivalent, but,  
15 yes, there would be distress if you waited two years and  
16 everything was right.

17 MR. BROWN: We are certainly not in a position  
18 to tell you what date is the correct date. We are here  
19 to point out qualitatively though that the mention of  
20 the problem that would arise if a decision were somewhat  
21 precipitous, or to put it more bluntly, if the cart got  
22 before the horse it would not be exactly the kind of  
23 problems the regulatory commissions or anyone else who  
24 observes them would be prepared to deal with as a  
25 routine matter.

1           One of the interesting elements that came out  
2 of the discussion a few minutes ago is something that  
3 has been said repeatedly, namely, that what has been  
4 found really might not have constituted a safety  
5 problem. Using a lawyer's characterization, the words  
6 are different from what I have said, but from a lawyer's  
7 perspective the regulations are quite clear. The NRC's  
8 regulations don't have an error band. They don't  
9 provide that nuclear power plants shall be built  
10 according to standards set forth in this regulation or  
11 that plus or minus 13 errors or 27 errors or 10 or that  
12 there be an error band that might embrace a particular  
13 feature, a safety feature of the plant.

14           The Commission's regulations as written are  
15 comprehensive. They are intended to inspire confidence  
16 of the public. If they are in fact applied and  
17 implemented and verified they should just that, and I  
18 think people in the proceedings of the NRC, including  
19 this one, would look toward those regulations  
20 implemented aggressively as being a satisfactory  
21 assurance that the public health and safety is being  
22 satisfied. But we don't think it is appropriate for  
23 characterizations of the errors to be made any way that  
24 would give the impression that errors should be looked  
25 upon as a routine matter.

1           As we have looked at the verification program  
2 we have shared a problem with the staff. In fact, at  
3 one point we called the staff to say that the quality of  
4 the reporting was insufficient for us to really  
5 understand the implications of what was being found and  
6 we were told by the people on the staff that they were  
7 having the same problem.

8           I only bring that to your attention, and I  
9 don't bring it to make sure we are telling you something  
10 the staff already knows, but this Commission must be in  
11 a position in making the ultimate decision not to be in  
12 the dark in terms of what is being found and what the  
13 reports are saying.

14           We feel that certain things are being found,  
15 characterized and analyzed in ways that the portrayal of  
16 the facts and the evidence is not quite as clear as it  
17 ought to be. So on that point all we can do is caution  
18 the Commission and say assure yourselves that in fact  
19 the data that you are looking at when you are going to  
20 be called upon to make a decision are data which are  
21 sufficiently comprehensive to give you the assurances  
22 you need.

23           We also are concerned that when some problems  
24 develop there is an inclination of the staff to look to  
25 the independent verification effort of Teledyne as being

1 the center for the analytical work. We frankly take  
2 greater confidence if the staff would depend upon the  
3 repository of brain power at its own disposal rather  
4 than burdening the IDVP with additional work. The IDVP  
5 was established for a limited purpose to audit the  
6 events that followed the suspension of the license.

7           We would like to see more independent  
8 calculations done, more raw data generated and looked at  
9 by the Brookhaven National Laboratory. As we mentioned  
10 to the staff, we took a great deal of assurance in the  
11 fact that the staff was relying on Brookhaven and in  
12 several specific areas both Dr. Roesett and Mr. Hubbard  
13 will address how Brookhaven can be of further use.

14           We really don't take any comfort and we would  
15 oppose the Commission getting itself into a situation  
16 where it is dealing with a so-called step-wise licensing  
17 process. This is a case unlike any other. I don't  
18 think it is an appropriate case in which we ought to  
19 consider creating a step-wise process which is  
20 different, too. If it is a matter of 40 days, or any  
21 other number of days, the position of the State of  
22 California would be that the Nuclear Regulatory  
23 Commission look at the hard evidence and not develop a  
24 process which does anything that causes the Commission  
25 to rely upon well-intentioned commitments and

1 well-intentioned promises or the best intentions of any  
2 of the parties in the case.

3           What we would ask is that the Commission have  
4 before it hard information, that it be cautious and that  
5 it remember the lessons over the past year which have  
6 been punctuated by an evolutionary character.

7           With that, I would like to introduce Dick  
8 Hubbard for his presentation.

9           (Slide presentation.)

10          MR. HUBBARD: Thank you, Herb.

11          I am going to cover essentially six matters  
12 today:

13           First, a brief content statement about what  
14 breakdowns have been discovered in the management  
15 systems to date and my perspective on those;

16           Secondly, a tie back to the regulations to  
17 talk about the 18 criteria of Appendix E and what we  
18 really found to date;

19           Third, to summarize the key areas where we  
20 recommend that the proposed phase to reverification  
21 program be expanded;

22           Fourth, some thoughts having to do with  
23 sampling and use of statistics, both at the NRC and as  
24 part of the independent program; and

25           Finally, some thoughts about scheduling.

1           The next chart please.

2           We believe that what has gone on to date has  
3 shown a widespread pattern of significant breakdowns in  
4 management controls in both design and site activities.  
5 If you remember a year ago at the time of the Udall  
6 hearings we were talking about approximately 14 errors  
7 of some significance at that time. Well, we stopped  
8 counting soon thereafter, but if you read various  
9 reports there are up around 200 or so discrepancies of  
10 one sort or another and these are major discrepancies.

11           Like one error might be the turbine building,  
12 another error the auxiliary building and a third error  
13 the fuel handling building. These are errors that have  
14 multiple parts associated with them. There have been  
15 errors found between the as-built and the as-analyzed  
16 plant.

17           Now you have to remember that that was already  
18 looked at and relooked at as part of the Bulletin 79.14  
19 review. So to find that not on really the first time  
20 through but the second time through says again that  
21 there was something that wasn't quite right in the  
22 inspection process and in the design process that was  
23 going on at Diablo Canyon.

24           COMMISSIONER GILINSKY: Let's see, you are  
25 talking about discrepancies between the plans and the

1 condition of the plant which were not uncovered in the  
2 79.14 review?

3 MR. HUBBARD: Yes. There was a 79.14 report  
4 in 1980 that said about 26 percent of the piping systems  
5 would have to be reanalyzed. That was in response to  
6 Bulletin 79.14. Well, you will notice that the IDVP has  
7 found repeated examples where the as-built plant differs  
8 from the as-analyzed. That should have been picked up  
9 in the 79.14 review. That says even when it has been  
10 relooked at there were still errors there. I think that  
11 is significant.

12 As part of the seismic review there were also  
13 some non-seismic discrepancies in design found, and of  
14 course we have the Reedy Report which looked at the  
15 quality assurance program and found that it was  
16 deficient. It was inadequate in policies, in procedures  
17 and in implementation.

18 Well then you look at how the NRC program  
19 evolved over that same period of time. You had the  
20 Brookhaven Report and I think a very useful report where  
21 you go off and do separate calculations and then compare  
22 them. Brookhaven found errors in modeling, that the  
23 model parameters were potentially incorrect and then  
24 they looked at how some of the modeling techniques were  
25 used, such as response spectra smoothing. So we support

1 the idea of dual studies of areas. This is a good way  
2 of verification.

3 Then you have the Region V letters that you  
4 are familiar with. There was one back in March talking  
5 about the need for a construction QA audit and the more  
6 recent one talking about the possible generic  
7 implications of the Reedy findings.

8 A third point with the staff is that we have  
9 had a continuing dialogue with them about the Phase  
10 I/Phase II dichotomy as we have said. We never saw the  
11 technical reason for that dichotomy because we always  
12 thought that the June '78 date was not significant and I  
13 think we and the staff would essentially come to accord  
14 on that and which leads in to really PG&E has seen the  
15 same thing.

16 We started off to sample the design with the  
17 idea that if the sample looked good, well, then that is  
18 as far as we would have to go. PG&E saw the handwriting  
19 on the wall and to their credit they have now put 800 to  
20 1,000 engineers to work. What they are doing is they  
21 are remodeling the plant in some cases, they are  
22 revising the parameters for the seismic design and then  
23 that result is new seismic spectra which result in new  
24 analyses. So we have gone from a reverification to  
25 really a redesign program.

1 PG&E also has done some internal reviews.  
2 They had the Blume internal review, which documents some  
3 150 discrepancies of which maybe a third of them might  
4 have been significant, and they also did a QA look-back  
5 review which found the same things that Reedy found.  
6 Again to their credit they did look and say we ought to  
7 take a look at the construction QA program.

8 In reading the transcript of your meeting back  
9 on last October 20th, the sense I got was well, there  
10 hadn't been a lot of problems found. The impression I  
11 would like to leave with you is that when one has gone  
12 to look there have been lots of problems found. In  
13 fact, in almost every area that has been looked at there  
14 have been problems.

15 The next chart, please.

16 COMMISSIONER AHEARNE: I guess the impression  
17 I believe the staff tried to give us, and as I recall  
18 there was even something explicit in one of the items we  
19 had, was not that they had found very few items, but it  
20 was that the items that were found they did not believe  
21 ended up being significant, significant in the sense as  
22 to requiring a modification to the plant because without  
23 the modification it brought into question the ability to  
24 assure adequate protection of the public health and  
25 safety. I think it was in that definition, or that was

1 the impression at least that I got out of it.

2 MR. HUBBARD: I think I got out of it that the  
3 modifications that have occurred so far have been  
4 amenable to modification. We haven't had something like  
5 inside the core where the core was irradiated and very  
6 difficult to get to or things of that sort. The  
7 modifications have been amenable to construction rather  
8 readily, but there have been lots of them.

9 I think it is important to really get back to  
10 Appendix B ---

11 CHAIRMAN PALLADINO: I didn't understand what  
12 you said. You were talking about irradiated stuff.  
13 There is no core in there, is there?

14 MR. HUBBARD: That is absolutely correct.

15 (Laughter.)

16 MR. HUBBARD: You know, people have sometimes  
17 come I know to me and said, Dick, is there something  
18 here that is going to be impossible to modify, and my  
19 answer has been no, these things are amenable to  
20 modification. We haven't come to that sort of a point  
21 yet, but there have been lots of them.

22 COMMISSIONER AHEARNE: Do you disagree with  
23 what I believe the staff had characterized as that the  
24 modifications so far found necessary, that none were  
25 significant?

1           MR. HUBBARD: I disagree with that, yes. I  
2 think the margins are there for a reason and I think  
3 that there have been a large number of these.

4           COMMISSIONER AHEARNE: Well, why don't you  
5 continue and at the end of the presentation that is  
6 something that I would like to go back to.

7           MR. HUBBARD: One of the things that has not  
8 been talked about a lot is about the 18 criteria of  
9 Appendix B. It had always been part of defense in depth  
10 that you would have an adequate QA program. Likewise,  
11 if you are doing probabilistic risk assessment, you have  
12 to assume that the quality assurance program has been  
13 implemented properly.

14           What we find out at Diablo is that 13 out of  
15 the 18 criteria at least have not been implemented  
16 properly, for example, criteria 2 on QA programs being  
17 implemented at the earliest practicable time. Some  
18 people did not have QA programs. the design control, the  
19 controls of interface and verification of drawings did  
20 not happen. Procurement document control, service  
21 contractors were not controlled and the requirements  
22 were not spelled out. There were not the necessary  
23 instructions, procedures and drawings and control of  
24 documents as required by criteria 5 and 6.

25           Criteria 7 says you buy services and materials

1 from qualified vendors, and part of the qualification is  
2 seeing that they have a quality assurance program. That  
3 didn't happen.

4           Inspections and test control, if there is a  
5 difference between the as-built plant and the as-built  
6 drawings, well then what was going on in inspection?  
7 That is one of the first things you inspect to see that  
8 just physically it is built to the drawings. Before you  
9 look to see if you have good welds, you see if it is  
10 welded in the right place.

11           Test control, the tests were not controlled,  
12 people that did the soil testing and also some of the  
13 testing done at Wiley Labs.

14           We find that nonconforming materials were  
15 installed and not controlled, that there were inadequate  
16 records available and that the PG&E audit program might  
17 have found some of these but didn't get them corrected  
18 as required by criteria 16.

19           So it says in general there was a breakdown of  
20 these QA procedures. One of the key things is that  
21 these QA procedures were issued in 1970. These are not  
22 new. We are talking about the period of 1978 when these  
23 were still not being complied with.

24           Now my experience at General Electric was the  
25 QA Manager there said that by the 1972 and the early '73

1 period we understood in depth what these 18 criteria  
2 meant and that we had the systems installed. Later on  
3 there were ANSI standards issued which further clarified  
4 those, but we had the type of program to meet these  
5 criteria well before the 1977-78 time period.

6 Then really turning to finding 3 about the  
7 proposed Phase II reverification program, we would agree  
8 with the staff that there are some things that may need  
9 and most probably will need to be looked into.

10 First, that as you know, in Phase II three  
11 systems have been reviewed, a piping system, an air  
12 system and an electrical system and there have been  
13 approximately 60 design discrepancies identified to date.

14 In my reading of the transcript from Dr.  
15 Cooper is that he said while they were fewer in number,  
16 they are about equal in significance to that that was  
17 found in the seismic program. I think a fair reading  
18 would be that we went out and we took the sample and the  
19 sample showed that there is the same breakdown in design  
20 and design control that we found in the seismic area.  
21 So that sampling is no longer appropriate and I would  
22 expect that the staff would eventually conclude and we  
23 would recommend that there would be a complete design  
24 review of the nonseismic safety areas in the plant.

25 Then turning to the construction QA review,

1 one would expect that to be in better shape. We have  
2 had the resident inspector there and there has typically  
3 been more controls of construction then there has been  
4 of the design process.

5           However, you know, we don't really know what  
6 we are going to find out there yet. There have been no  
7 reports issued. I did talk to Dr. Cooper yesterday and  
8 he told me that in the report that we will be getting  
9 this week there will be 20-some discrepancies that have  
10 been found to date. I think it is fair to say that  
11 those have not been addressed about their significance.  
12 So that remains to be an open item.

13           But if you are of the belief that quality  
14 starts at the top and has to do with the management  
15 attitude, well then some of this same mangement attitude  
16 towards quality and discipline that we found in the  
17 design process it is very likely we will find in the  
18 construction process to some degree, albeit I would  
19 expect it to be somewhat better at the construction site.

20           Third, the Commission in their order said to  
21 look at equipment important to safety. Well, I am not  
22 sure you meant really important to safety as reflected  
23 in GDC-1. But you are all familiar that important to  
24 safety equipment is a much broader category of equipment  
25 than just safety related. In fact, Harold Denton gave

1 you a memo on that, as I recall, back in November of  
2 last year and we would recommend that properly this  
3 program should address equipment important to safety.  
4 As a matter of fact, that is what your order says.

5           COMMISSIONER GILINSKY: You just don't think  
6 we mean it.

7           MR. HUBBARD: I don't think you meant it in  
8 all honesty.

9           Then, finally, we think that Westinghouse is a  
10 very significant part of this reverification program.  
11 In reviewing documents as part of the ongoing licensing  
12 hearings, one of the first requests I made in 1976 was  
13 give me your seismic and enviromental spec that tells me  
14 if I am an engineer and I go into the third floor what  
15 the requirements are at that particular location.

16           Well, I never could get that document and I  
17 always thought that I was asking the question in the  
18 wrong way because I knew at GE as an engineer if I  
19 wanted to find the seismic, the environment, any of  
20 those things for a particular area as a design engineer  
21 there was a design document that told me that.

22           Well, it turns out that years later that no  
23 such document existed and there was a great deal of  
24 informality in how that information was transferred. I  
25 found that to be true with Westinghouse because I saw

1 repeated letters from Westinghouse dating back to the  
2 '68-69 time period where they said please tell us, we  
3 are building the equipment, tell us what the  
4 requirements are. So I think if one looks over the  
5 entire time period one would feel that there is a large  
6 potential for a lack of information to be properly  
7 processed in that area.

8 Then turning to the fourth finding, and I want  
9 to keep within my time period, this is probably less  
10 important than the others, but I think equally important  
11 to you.

12 COMMISSIONER GILINSKY: Let me ask you, when  
13 you add Westinghouse, isn't that caught up by the  
14 important to safety category?

15 MR. HUBBARD: Well, in the NRC proposal they  
16 talk about looking at the PG&E/Westinghouse interface.  
17 It was not clear what they meant by that and I would  
18 like to declare by what I mean that it has to do with  
19 both seismic and nonseismic and both safety related and  
20 important to safety. Does that answer your question?

21 MR. BROWN: I think what Commissioner Gilinsky  
22 is saying is what you are saying here, Dick, "Add  
23 Westinghouse to reverification program."

24 COMMISSIONER GILINSKY: Wouldn't  
25 Westinghouse's equipment fall under the important to

1 safety category or safety related?

2 MR. HUBBARD: Some of it would.

3 COMMISSIONER GILINSKY: Wouldn't essentially  
4 all of it being the primary system?

5 MR. HUBBARD: Yes.

6 The fourth is sort of a general recommendation  
7 I wanted to bring to you and that is that there is a lot  
8 of sampling done in the nuclear industry and people draw  
9 conclusions based on those samples. Now when you go to  
10 a statistician you might say well, if you are going to  
11 draw conclusions, you have to make a representative  
12 sample, a random sample, and there are techniques for  
13 doing that and there are techniques for setting up  
14 experiments.

15 So the net impact of all of this is to say  
16 that, you know, financial auditors have been using  
17 statistical techniques for sampling for years. They are  
18 proven and they are available. You can decide what  
19 level of confidence you want, like 99 percent confidence  
20 or less than one percent errors, and then you can tell  
21 your own people we would like that degree of confidence  
22 on these particular matters. They can go and take that  
23 kind of sample and come back to you and then say that we  
24 have that degree of confidence in our results.

25 We think that statistical work would be useful

1 to the NRC staff when they draw conclusions that the  
2 plant has been properly implemented. It would also be  
3 useful if it is being used by either Teledyne or PG&E in  
4 their work.

5           Then, finally, to get to the schedule, I think  
6 Herb Brown really stated our primary thought, which is  
7 that the schedule should not be based on anything that  
8 would increase the likelihood of significant errors  
9 being disclosed after you all make your decision to  
10 reissue the license.

11           COMMISSIONER GILINSKY: Can I take you back to  
12 your previous point about the sampling program. Do you  
13 have some specific examples of sampling that was done  
14 incorrectly?

15           MR. HUBBARD: Yes. Well, I will start with  
16 the NRC staff. At a typical hearing the NRC staff is  
17 asked how is the quality program and the answer is well,  
18 it is about the same here as every place else or a  
19 little better or a little worse.

20           Well, if you are interested in having the I&E  
21 people or the resident inspector be able to answer that  
22 question you could say well, we have decided that the  
23 followi - specific things are important to quality and  
24 then we want to be at this level of confidence. That  
25 would say like you might have to go look at 50 pipe

1 supports or you might have to relook at 25 radiographs,  
2 and based on what he found he could come to you and  
3 rather than say well, based on my judgment and  
4 experience, he could say we made this type of study and  
5 this is what we can tell you. Then it would have some  
6 technical meaning rather than this technical judgment.

7           We often get into where people say well, I  
8 picked this sample based on my judgment. I am saying at  
9 all that judgment shouldn't be used to do his samples,  
10 but statistical techniques can complement judgments.  
11 There have been lots of examples that statisticians have  
12 that where you have made judgment samples they have not  
13 been representative of the population for various  
14 reasons.

15           CHAIRMAN PALLADINO: I don't disagree with  
16 your comment about statistics and sampling, but I  
17 thought in some of the cases the sample was a sample  
18 system by which we were going to check whether they had  
19 had a consistent QA approach and that is not necessarily  
20 something that would involve statistics of a large  
21 number of things.

22           MR. HUBBARD: Well, I guess what I am getting  
23 at is if you believe that one can take a sample and then  
24 infer something about a total population based on the  
25 sample, which seems to be something that is done rather

1 routinely, then it would seem to me that one ought to  
2 have the discipline of statistics when one does that.

3 COMMISSIONER GILINSKY: I think also your  
4 point is a good one just in a general sense, but ---

5 COMMISSIONER ROBERTS: He is asking your for  
6 specifics. You didn't answer his question.

7 COMMISSIONER GILINSKY: I guess what I would  
8 say is it is pretty hard to apply in a nuclear plant  
9 which has a very complex mix of varieties of equipment.  
10 I don't think this is the place where we are going to  
11 resolve this, but it is not an easy thing to do.

12 MR. HUBBARD: For example, like looking at  
13 radiographs, looking at as-built pipe supports and there  
14 are a number of areas ---

15 COMMISSIONER GILINSKY: There are certainly  
16 areas where one can do a lot better.

17 MR. HUBBARD: You can check environmental  
18 qualification that way. I mean I think it would be a  
19 possibility to do reduce your effort and then be able to  
20 say things with a certain more degree of technical  
21 confidence.

22 COMMISSIONER GILINSKY: You are proposing a  
23 more quantitative approach.

24 MR. HUBBARD: Yes, and I agree that this is  
25 more a pet peeve than the thrust of the rest of the

1 presentation.

2 (Laughter.)

3 COMMISSIONER AHEARNE: It sounded like  
4 something more applicable in general than perhaps here.

5 MR. HUBBARD: Yes. I will leave that.

6 (Laughter.)

7 CHAIRMAN PALLADINO: Can I ask you one  
8 question. You left with the last point about schedule,  
9 but without regard to schedule what is your general  
10 feeling about the staff's reverification program or the  
11 one recommended by the staff? I don't think you  
12 commented on it except perhaps tangentially with regard  
13 to statistics and I am not sure if I missed any other  
14 points.

15 MR. HUBBARD: Well, I would like to go back to  
16 finding 3 then. Findings 3 and 5 specifically address  
17 the staff proposal. The findings to date I think of  
18 Phase II indicate, along with the Reedy Reports, that  
19 sampling is no longer appropriate in the nonseismic  
20 safety design area and that a complete review is  
21 required. As I recall, Harold Denton said they hadn't  
22 made a decision on that when he visited you on the  
23 20th. So that is an area where we think ---

24 CHAIRMAN PALLADINO: I thought the licensee  
25 said he was a doing a hundred percent.

1 MR. HUBBARD: Only in the seismic area.

2 CHAIRMAN PALLADINO: That is the area I  
3 thought you were talking about.

4 MR. HUBBARD: No. I am talking about Phase II.

5 The construction QA, I think that should be  
6 melded into the Phase II program. I think a difference  
7 I would have with the staff is I don't have a lot of  
8 confidence in interim reports. It would seem to me that  
9 after we have found what we found to date that this is  
10 not the time to cut back on the requirements.

11 I was sitting in a room like this about a year  
12 ago and at that time PG&E proposed that they be able to  
13 load fuel before they finished even the program they had  
14 in mind at that time. That was in October a year ago,  
15 and, you know, on November 19th you ruled no and said  
16 that at least the seismic area had to be done before  
17 fuel loading and low-power testing.

18 Well now after hundreds of discrepancies have  
19 been found and thousands of man-years of engineering  
20 effort they are back with the same sort of a proposal.  
21 I thought it was inappropriate then and I think it is  
22 inappropriate now. I think we should go ahead and  
23 finish the review and get the reports and then make the  
24 decision and I draw the line on engineering. I say I  
25 think the engineering ought to be completed before you

1 all make the decision. I could see some modification  
2 taking place after your licensing decision.

3 CHAIRMAN PALLADINO: I was trying to fix in my  
4 mind where you thought this plan failed. One, you said  
5 you don't agree with the approach we are taking on the  
6 nonseismic analysis, no confidence in status reports,  
7 and I can understand that. Now what other points?

8 MR. HUBBARD: The construction QA review I  
9 believe should be completed. Third, that the review  
10 should include important to safety as well as the  
11 subclass of safety related equipment.

12 CHAIRMAN PALLADINO: What do you mean by that?

13 MR. HUBBARD: GDC-1 of Appendix A talks about  
14 equipment important to safety and that is a broader  
15 category than the narrow category of safety related. So  
16 there would be things like, oh, rad waste systems and  
17 some of the recirc. systems and so forth, that might not  
18 necessarily fall in the category of safety related, but  
19 are important to safety.

20 CHAIRMAN PALLADINO: And you say they should  
21 be reviewed in what way?

22 MR. HUBBARD: They should be included in the  
23 Phase I/Phase II program. They should not be just  
24 ignored.

25 Fourth, then, I think the Westinghouse part is

1 a key, that we should look at more than just the  
2 interface on some of the seismic areas. It should look  
3 at both seismic and nonseismic and then might even want  
4 to go inside Westinghouse to look to see if they had  
5 implemented some of the requirements correctly.

6 CHAIRMAN PALLADINO: Let's see, what is it  
7 that we are going to look at at Westinghouse? I am  
8 sorry, what your proposal is.

9 MR. HUBBARD: Our proposal is that  
10 Westinghouse is responsible for a great deal of the  
11 seismic design of the plant related to equipment and  
12 also a number of the important to safety systems. So  
13 therefore the interface between they and PG&E is very  
14 important. They are probably PG&E's major design  
15 subcontractor. So if you are interested in the control  
16 of information to PG&E subcontractors, then I think  
17 Westinghouse would be key to that and the attention to  
18 date has primarily been on Blume and the other people  
19 other than the NSS suppliers really.

20 I am saying that I think there should be a  
21 clear focus on Westinghouse as part of this Phase  
22 I/Phase II program.

23 CHAIRMAN PALLADINO: Is there some special  
24 reason or is it just a general good point?

25 MR. HUBBARD: I tried to briefly say that when

1 I have gone to look at the documents that were  
2 transmitted to Westinghouse, there were a number of  
3 questions Westinghouse had that did they have the right  
4 information and up-to-date information. You are aware  
5 that there was no book of response spectra, one book  
6 that the designers would have that you would then keep  
7 revisions of and transmit to the various people that did  
8 design work. That was true in just the seismic area.  
9 Westinghouse did not have this sort of a document. They  
10 also didn't have it for a number of other areas. There  
11 was a lot of informality in the way information was  
12 transferred between PG&E and Westinghouse. So from my  
13 experience it would suggest there is a potential for  
14 error there.

15 CHAIRMAN PALLADINO: Is it any greater here  
16 than it might be in any other plant that involved  
17 Westinghouse?

18 MR. HUBBARD: Yes, because PG&E was their own  
19 A/E and constructor. So PG&E is a little bit unique  
20 that way. The people like the Stone and Webster's and  
21 Bechtel's over the years have worked out quite  
22 disciplined paper systems that are transferred back and  
23 forth between the A/E's, and I think PG&E had a  
24 different view on the amount of paper that was needed to  
25 control the interfaces.

1           CHAIRMAN PALLADINO: Okay, thank you.

2           MR. HUBBARD: My last point on scheduling I  
3 have already talked about. There was one key thing on  
4 that. I would like to say though that Teledyne started  
5 out to do a reverification, to go in and take some  
6 samples and see if the design was implemented properly  
7 and they have issued a large number of reports now  
8 saying what they did or what they found.

9           But I think now we are asking Teledyne to do  
10 something quite differently in addition and we have new  
11 spectra and we have new models and we have new  
12 parameters in models and we are asking them their  
13 opinion on that, "we" being the Nuclear Regulatory  
14 Commission.

15           (Laughter.)

16           MR. BROWN: I knew I wasn't aware of that.

17           (Laughter.)

18           MR. HUBBARD: That definitely was a Freudian  
19 slip.

20           (Laughter.)

21           MR. HUBBARD: Well, it does show we are  
22 counting on them from the State of California, too, to  
23 do a good job.

24           The point is their role has changed and it has  
25 not been real clear, at least to us, on how they intend

1 to go about ensuring that the new models are correct and  
2 that now the correct parameters have been used which  
3 will result in correct response spectra which will  
4 result in correct analyses. But this is a lot of work  
5 and we have, you know, basically a thousand people  
6 involved in this reanalysis project at PG&E again under  
7 some time restraints. So expect Teledyne to do that  
8 very quickly is a large undertaking.

9           CHAIRMAN PALLADINO: Mr. Hubbard, we have  
10 another meeting at 3. We do want to give Mr. Roesett  
11 his chance and we do want to have some Commission  
12 questions. So unless you have some other pressing  
13 point, I am going to suggest we go to questions from the  
14 Commissioners.

15           COMMISSIONER AHEARNE: I had only one question  
16 and that was as I had mentioned earlier, I wonder if you  
17 could say what you believe are the significant  
18 discrepancies that have been found. I ask the question  
19 in the context of their previous presentation in October  
20 in which the depiction was that there was no significant  
21 discrepancy found, in the sense of significant in that a  
22 modification having to be made and if the modification  
23 weren't made it would call into question the ability to  
24 give the adequate assurance that public health and  
25 safety would be protected. I think that was the context

1 of the staff as their preliminary judgment.

2 MR. HUBBARD: Well, I think any modification  
3 would be significant if design limits were exceeded. So  
4 I would say that all 400 modifications that have been  
5 made to date are significant.

6 COMMISSIONER AHEARNE: And that is because the  
7 design limit was exceeded rather than because of  
8 anything the reanalysis showed; is that correct?

9 MR. HUBBARD: I don't understand your question.

10 COMMISSIONER AHEARNE: Well, as I recall, in a  
11 couple of the cases they said yes, the design limit  
12 might have been exceeded. However, on reanalysis of the  
13 specific weld or the specific pipe in the specific  
14 location that it was within the required parameters.

15 MR. HUBBARD: Well, I would have understood if  
16 they found that they didn't make a modification. Then  
17 they made a statement saying that rather than go back  
18 and do some rather detailed analyses, they went ahead  
19 and made some modifications and I don't know how many of  
20 those were made for that reason.

21 My general sense would be that we are not  
22 talking about small amounts of errors. I mean when you  
23 put 800 to 1,000 engineers on a project and go back and  
24 remodel and come up with new parameters for models which  
25 result in new spectra, I think those are significant

1 breakdowns in the flow of engineering information.

2           COMMISSIONER AHEARNE: I certainly didn't  
3 intend to give the implication that the staff had  
4 concluded that that characterization that you just made  
5 was not correct. It was more that they had  
6 characterized that the final result of all the changes  
7 when you end up looking back and saying now what  
8 significant change had to made to the plant, their  
9 preliminary conclusion as described was well, there  
10 weren't any. I was trying to get your sense where you  
11 came out on that.

12           MR. HUBBARD: Well, that is where I said I  
13 disagreed. I think a more correct statement is that the  
14 changes have been amenable to ready construction, but  
15 there have been lots of them.

16           MR. BROWN: There is a footnote that deserves  
17 to be mentioned for whatever it is worth. You will  
18 recall that there was a great deal of controversy over  
19 the appropriateness of the design spectra to begin  
20 with. In such a situation it may well be worth the  
21 Commission's attention just to at some point consider  
22 that there were some close questions about damping, tau  
23 effect, free field and so on.

24           COMMISSIONER AHEARNE: I remember them well.

25           (Laughter.)

1           MR. BROWN: Given the ambience of uncertainty,  
2 at least as we looked upon it, that attended that whole  
3 area of seismic design, the finite, careful calculations  
4 that show that the design spectra are not exceeded by  
5 certain other finite amounts might not have the same  
6 persuasiveness and weight that they would have in a  
7 different situation where everyone was very comfortable  
8 with there not being a tau effect and so on.

9           COMMISSIONER AHEARNE: That is true.

10          MR. BROWN: Dr. Roesett perhaps should go  
11 ahead now.

12          MR. ROESETT: My name is Jose Roesett. I am a  
13 structural engineer. I spent 14 years on the faculty of  
14 MIT and now four years in Texas. Most of my work has  
15 been related to structural dynamics, earthquake  
16 engineering and seismic design of nuclear power plants.  
17 I just say this to indicate I am only concerned with the  
18 seismic part in my comments.

19                 I was not involved before at any time in  
20 Diablo Canyon. Last July I was asked by the Office of  
21 the Governor of California to review the Brookhaven  
22 Report and to advise them on the implications of this  
23 report and my opinion and since then I have been asked  
24 to read some of the technical reports that have been  
25 issued.

1           I would like first to make some comments on  
2 the Brookhaven Report and its implications to the  
3 completion of Phase I and Phase II and then maybe I  
4 should make some comments of a general nature answering  
5 some of your questions.

6           The Brookhaven Report is in my opinion a very  
7 valuable piece of work in relation to what we are trying  
8 to do here. If we are going to assess its value, we  
9 have to consider two different things. One, this report  
10 has identified some errors which are both of a specific  
11 nature in relation to the annulus structure and they are  
12 also of a generic nature.

13           The question has been raised would these  
14 errors have been detected if the Brookhaven study had  
15 not been conducted, and if I remember properly the  
16 answer by the staff was well, it is hard to say, maybe  
17 yes and maybe no.

18           I think that errors like the weights and  
19 masses being wrong, these would have been detected  
20 certainly. The connections might have been detected or  
21 might not have. But more importantly, in the Brookhaven  
22 Report they showed that the two-dimensional model that  
23 was being used to reproduce the vertical vibration was  
24 not correct. The three-dimensional results were very  
25 different.

1           Now that is something that might not have been  
2 detected at all because we are very used in practice to  
3 accept two-dimensional models to reproduce  
4 three-dimensional situations and we are putting  
5 ourselves in the situation where sometimes the standard  
6 of practice, what it does is to perpetuate if you want a  
7 mistake. We keep doing two-dimensional analyses and we  
8 say, well, that is a standard practice, so it should be  
9 all right, and yet they may not always be.

10           Now clearly if we have a situation where we  
11 have a very flexible floor system, that is going to  
12 affect very much the vertical response spectra. Once  
13 you have the results of the three-dimensional analysis,  
14 it is always possible and it is easy to go back and say,  
15 well, you see now I can make a two-dimensional model and  
16 reproduce the same thing. But before you have them,  
17 that is not always a reason.

18           So I think this particular point was one that  
19 probably would not have been detected, and that is a  
20 point that refers both to the underlying structure and  
21 maybe also to other structures.

22           I know that Mr. Cooper was asked to explain  
23 whether he thought that this could influence other  
24 structures. In his letter he said that it is highly  
25 improbable. Well, to me that is not enough to say it is

1 highly improper. Someone has to check that for the  
2 other structures whether two-dimensional models are  
3 valid or not and that we are not going to have the  
4 situation where there the slabs are very flexible in  
5 relation, not by themselves but in relation to the  
6 stiffness of the vertical load carry ends which is where  
7 you are going to have that discrepancy. So that check  
8 has to be done.

9           Now the second point in assessing the value of  
10 the Brookhaven Report is that it represents a different  
11 kind of verification. What the independent verification  
12 program is doing mostly, what Teledyne is doing mostly  
13 is looking over the shoulder of PG&E and Bechtel  
14 checking the values of the weights and the values of the  
15 different parameters, dimensions, checking that the  
16 procedures are the ones normally used in practice and  
17 that they are reasonable procedures and accepting them  
18 and this is very important. In fact, it has produced  
19 very good results.

20           What Brookhaven did is say we take this  
21 problem with entire independence, we develop our own  
22 model, we use our own analyst techniques and we come  
23 with the results. Now what we are going to do is  
24 compare the results. Now this type of verification is  
25 not unusual in a nuclear power plant and is certainly

1 very valuable.

2           None of us is interested in any way in  
3 delaying Diablo Canyon. When you asked whether I would  
4 be distressed by delaying for two years, I would  
5 certainly be. I am distressed when I think it has taken  
6 16 years to design and build this facility. On the  
7 other hand, it is clear that it is in the interest of  
8 everybody, including PG&E first of all, to make sure  
9 that when we go now to license this plant everything is  
10 right.

11           Now we have consider how are we going to  
12 decide that this is right. How is the staff going to  
13 decide that this is right. They are still using in all  
14 the design the floor response spectra say for that  
15 structure and the floor response spectra which are  
16 supposedly wrong. Even the latest comments by Mr.  
17 Cooper indicate that yes, the Brookhaven spectra seem to  
18 be right and they are different from the ones that are  
19 being used which means all this work that is being done  
20 is going to have to be repeated. Things are going to  
21 have to be rechecked. Somehow we have to check that  
22 this is not going to happen in other structures.

23           I was very happy to see that the staff  
24 indicated that Brookhaven is going to assist in checking  
25 the reports and the verification program and that there

1 are three more studies that Brookhaven is going to do.

2 I would strongly recommend to improve our  
3 confidence that Brookhaven be asked also to check  
4 whether for other structures like, for instance, the  
5 auxiliary building, not necessarily to do an analysis of  
6 the auxiliary building, but to check that the  
7 two-dimensional model may be correct and we don't have  
8 to go to a three-dimensional modeling for that one.

9 In the auxiliary building there are some soil  
10 springs that have been used which are extremely hard to  
11 visualize, I mean they don't seem to make much sense.  
12 The latest report, Report No. 6, points out that these  
13 springs were wrong originally and they have re-evaluated  
14 them.

15 COMMISSIONER GILINSKY: What kind of springs?

16 MR. ROESETT: Some soil springs to account for  
17 the fact of soils because there is some partial  
18 embedment. But you see the report does not have a  
19 sketch of the soil profile. It does not indicate how  
20 those springs were computed. It says that the original  
21 ones were wrong and consequently new ones and it seems  
22 to suggest that those springs are important in the  
23 results. Well, I think again those springs are going to  
24 have to be checked and what they are doing with those  
25 springs. I think Brookhaven should do that. That is

1 just a check.

2           Now we have the turbine building. The turbine  
3 building in this plan is a Class I structure which is  
4 not normally the case. It is a structure supposedly  
5 that has undergone major modifications. It has become a  
6 rather complex structure. I think Brookhaven should  
7 probably conduct an analysis of that structure, and if  
8 they start doing the analysis now they might have the  
9 results at the same time as PG&E has their results  
10 because their results for the turbine building are not  
11 yet available.

12           It is my impression that if we were to do that  
13 we would in fact gain some time as far as then  
14 evaluating the final thing and having some confidence in  
15 the results. My main conclusion here will be to stress  
16 the importance of what Brookhaven has done and to  
17 recommend to continue doing some of these things and  
18 even expand to do a couple of additional things.

19           Now I would like to make some more general  
20 comments just very briefly. The technical reports that  
21 have been issued until now, the ones that I have seen,  
22 if those are the ones that the staff is going to have to  
23 evaluate to make their recommendations, they are written  
24 in a very unclear way. I think the staff is going to  
25 have tremendous problems trying to arrive at conclusions

1 from those reports.

2           As I mentioned before, if you take even the  
3 report for the auxiliary building, which is a clear  
4 thing, there is no indication of how the dynamic degrees  
5 of freedom were selected. They talk about these springs  
6 and there are no formulas, there are no references to  
7 these springs and there is no sketch showing them.

8           Many of the reports limit themselves to saying  
9 an open item has been reported, has this file number, is  
10 being investigated and has been classified as a Class A  
11 or Class B error and action is being taken. There is no  
12 much you can say about that. I mean you can be  
13 satisfied that some solid work is being done in  
14 detecting errors, but you cannot say whether it was  
15 properly detected or not.

16           The second point is that a lot has been made  
17 here about the fact that 200 open items were identified  
18 and out of 200 there were only 13 errors, or 14 errors  
19 or 15 errors according to the IDVP and 27 according to  
20 PG&E. I don't think that is very relevant. There could  
21 have been 2,000 errors; who cares. We started with one  
22 error and they have ballooned to 13 or 15. Again, that  
23 is not even significant. The importance is how  
24 significant those errors are. That is the thing that  
25 matters. I am trying to talk about all these other

1 things where there are only 13 out of 200 and that seems  
2 to confuse the issue.

3           If as a designer I do a mistake in designing  
4 the column of a building, just one column, and the  
5 building collapses ---

6           (Laughter.)

7           MR. ROSETT: --- it is no good to tell the  
8 people that are under the building the fact that I could  
9 have made 2,000 other errors and I didn't. It is  
10 unfortunate, but that is the way it is.

11           It is also being stressed that the  
12 modifications made until now are very minor  
13 modifications, but there again we have to be very  
14 careful with that. I think Mr. Denton in his statement  
15 was very clear about this. It does not mean that we  
16 didn't have to do that.

17           If you visit a city after a strong motion  
18 earthquake you are going to find some buildings which  
19 have entirely collapsed. You are going to have some  
20 buildings that have some damage and you are going to  
21 have some buildings that withstood the earthquake  
22 perfectly. One of the unfortunate things in earthquake  
23 engineering is that if you take the building that has  
24 collapsed, a very minor modification would have saved  
25 that building.

1           In most cases it is not a matter of saying we  
2 have to spend twice the amount of money to make the  
3 building safe. It is always little details, like if the  
4 anchors been properly done, the splicing, something that  
5 didn't cost any money that anyone would have classified  
6 as a very minor modification. So very minor  
7 modifications may be minor as far as the amount of work  
8 done, but not as far as importance.

9           In this context just to finish I want to say  
10 that in this particular case we have already allowed for  
11 the Hosgri earthquake some factors of safety which are  
12 smaller than the normal ones. So now we have to be a  
13 little bit careful because we don't have the same margin  
14 of safety that we would normally have.

15           That is it.

16           CHAIRMAN PALLADINO: Okay, thank you.

17           Were there any other points to be made by the  
18 joint intervenors or does that represent the whole  
19 presentation? I am not asking you to invent any. I am  
20 just making the opportunity because we are cutting into  
21 the time of our next meeting but I don't want to cut off  
22 anything that is important for us to hear.

23           (No response.)

24           CHAIRMAN PALLADINO: Are there questions from  
25 other Commissioners?

1 (No response.)

2 CHAIRMAN PALLADINO: I think you made some  
3 very good points and I appreciate it.

4 MR. FLEISCHAKER: I just have one comment. I  
5 am David Fleischaker and I wanted to pick up on the last  
6 point that Dr. Roesett spoke about and Herb Brown spoke  
7 about which is that there seems to be a lot of emphasis  
8 placed on whether the modifications have been minor or  
9 major.

10 I might suggest that maybe we are looking at  
11 this problem through the wrong end of the telescope.  
12 You will recall, first of all, as Dr. Roesett pointed  
13 out, that the Newmark spectra, which defined the  
14 earthquake forces, have already been reduced by a tau  
15 factor which hasn't been used in any other nuclear power  
16 plant construction and those reductions and those  
17 analytical techniques were challenged by the ACRS' own  
18 consultants. So you are starting out with a plant which  
19 has already a reduced margin of safety.

20 Secondly, we are operating on the edge of our  
21 understanding of physical phenomena.

22 CHAIRMAN PALLADINO: You are saying the use of  
23 the tau reduced the margin of safety? It is not clear  
24 to me that it reduced the margin of safety. Now there  
25 may be dispute over whether it is an applicable

1 reduction.

2 MR. FLEISCHAKER: I would argue that if you  
3 had to analyze the design of the plant without the tau  
4 reduction that you would come up with higher floor  
5 response spectra and I think that in that instance you  
6 would probably have a plant that was designed to more  
7 rigid or to higher standards.

8 CHAIRMAN PALLADINO: These don't always follow  
9 in dynamic situations, but go ahead.

10 MR. FLEISCHAKER: The second thing is that we  
11 are operating here on the edge of the understanding of  
12 physical phenomena, how the earthquakes occur and how  
13 the structures respond. Our concern here is, as Dr.  
14 Roesett has stated, that when you are operating in this  
15 environment you have to be very careful I think in  
16 drawing conclusions about whether the modifications that  
17 have been made are necessary to safety or not.

18 Other than that I don't think we have anything  
19 to add. Both Dick Hubbard and Jose Roesett have  
20 adequately covered the subjects that we would cover.

21 CHAIRMAN PALLADINO: All right.

22 Any questions by Commissioners?

23 (No response)

24 CHAIRMAN PALLADINO: Well, we thank all of you  
25 for coming here. You have made some very interesting

1 and important points.

2 We will stand adjourned.

3 (Whereupon at 3:10 p.m., the meeting  
4 adjourned.)

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NUCLEAR REGULATORY COMMISSION

This is to certify that the attached proceedings before the  
COMMISSION MEETING

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in the matter of: PUBLIC MEETING - COMMENTS FROM PARTIES ON PHASE II  
REVERIFICATION PROGRAM FOR DIABLO CANYON

Date of Proceeding: November 10, 1982

Docket Number: \_\_\_\_\_

Place of Proceeding: Washington, D. C.

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

Mary C. Simons

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Official Reporter (Typed)

Mary C Simons

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