



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

March 5, 2004

Gregory M. Rueger, Senior Vice
President, Generation and Chief Nuclear Officer
Pacific Gas and Electric Company
Diablo Canyon Power Plant
P.O. Box 3
Avila Beach, California 93424

SUBJECT: TRANSCRIPT FOR TWO FEBRUARY 4, 2004, PUBLIC MEETINGS

Dear Mr. Rueger:

This refers to the transcript for the Category 1 and the Category 3 public meetings conducted at the Embassy Suites Hotel in San Luis Obispo, California, on February 4, 2004. The first meeting was a technical meeting to discuss the results of the Special Report submitted following the December 22, 2003, earthquake near San Simeon, California. During the second meeting NRC provided a detailed interim exit of an NRC inspection conducted following the December 22 earthquake. The NRC will review the transcript to ensure that questions raised during the meetings are adequately addressed.

In accordance with Section 2.390 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and its enclosure will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams/index.html> (the Public Electronic Reading Room).

Should you have any questions concerning this matter, we will be pleased to discuss them with you.

Sincerely,

A handwritten signature in black ink that reads "William B. Jones".

William B. Jones, Chief
Project Branch E
Division of Reactor Projects

Dockets: 50-275
50-323
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Pacific Gas and Electric Company

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Enclosure:
Meeting transcript

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV

MEETING WITH DIABLO CANYON POWER PLANT MANAGEMENT
SAN LUIS OBISPO, CALIFORNIA
WEDNESDAY, FEBRUARY 4, 2004
6:30 P.M.

REPORTED BY CAROLYNN E. SPERE, CSR #10091

1 APPEARANCES:
2 FOR THE NRC:

3
4 T. GWYNN, DEPUTY REGIONAL ADMINISTRATOR
5 M. SATORIUS, DEPUTY DIRECTOR, DIVISION OF
6 REACTOR PROJECTS (DRP)

7 W. JONES, CHIEF, PROJECTS BRANCH E, DRP

8 D. PROULX, SENIOR RESIDENT INSPECTOR, DRP

9 T. JACKSON, RESIDENT INSPECTOR, DRP

10 G. SHUKLA, PROJECT MANAGER, NRR

11 G. BAGCHI, SENIOR-LEVEL ADVISOR

12 V. DRICKS, PUBLIC AFFAIRS OFFICE, RIV

13 FOR THE LICENSEE:

14 G. RUEGER, SENIOR VICE PRESIDENT and
15 CHIEF NUCLEAR OFFICER

16 D. OATLEY, VICE PRESIDENT and
17 GENERAL MANAGER

18 J. BECKER, VICE PRESIDENT, OPERATIONS and
19 STATION DIRECTOR

20 L. WOMACK, VICE PRESIDENT, NUCLEAR SERVICES

21 L. CLUFF, DIRECTOR, GEOSCIENCES
22
23
24
25

1 the table. We'd like to make sure that we get a good
2 attendance, so if you would please make sure your names
3 are on that. It's not required, but we certainly like to
4 be able to document that we had good turnout.

5 Pat mentioned about the transcripts. Kind of
6 going through a checklist here to make sure we take care
7 of all the administrative items.

8 With that, I think we will go ahead with NRC
9 introductions, and we'll start here at the head table,
10 and there are a few members of the NRC staff in the
11 audience. But we'll start to my far right.

12 Terry, would you start.

13 MR. JACKSON: My name is Terry Jackson. I'm a
14 Resident Inspector at Diablo Canyon, and we have -- as
15 has been said earlier, we do have our offices there at
16 Diablo Canyon, where we report to daily.

17 MR. PROULX: My name is David Proulx. I'm the
18 Senior Resident Inspector at Diablo Canyon. I am the
19 senior NRC on-site presence on a daily basis.

20 MR. BAGCHI: My name is G. Bagchi. I work at
21 the headquarters office in Rockville, Maryland, and I'm a
22 Senior-Level Advisor. And my background is in earthquake
23 engineering and review of Diablo Canyon, going back to
24 1976.

25 MR. JONES: Good evening. My name is Bill

1 WEDNESDAY, FEBRUARY 4, 2004
2 6:30 P.M.
3 * * *
4

5 MR. SATORIUS: Thank you, Pat, and the
6 transcriber will go on the record now.

7 Once again, I'm Mark Satorius. I'm Deputy
8 Director of the Division of Reactor Projects in our
9 Arlington office, which is Region IV. Our division is
10 responsible for the on-site presence of the safety
11 inspectors that are with me here today to my right.

12 Pat had pointed out some of the administrative
13 aspects of meetings that we are having tonight. I'll
14 point out a couple of other things. I note that if you
15 need the rest rooms, they are down the hallway and to the
16 left and then to the right, so that's where they are
17 located.

18 Within your handout materials, there are
19 feedback forms, and we value feedback that you will
20 provide us. So if you have feedback for us on the
21 conduct of this meeting, we'd appreciate any insights
22 that you have. You can either fill that out and give it
23 to a member of the NRC staff, or you can mail it. It's
24 postage-free.

25 There is an attendance sheet that is outside on

1 Jones. I'm the Branch Chief in Arlington, Texas, with
2 responsibility for Diablo Canyon and oversight process.

3 MR. SHUKLA: My name is G. Shukla. I'm the NRC
4 Project Manager for Diablo Canyon Power Plant in
5 Washington, D.C. My responsibility is for all the
6 interface between PG&E and NRC headquarters in
7 Washington, D.C.

8 MR. SATORIUS: And then, in the audience, we
9 have Victor Dricks, who is our Public Affairs Officer;
10 S. Wong, who is also assigned at the station; and Agnes
11 Jan, who is the site secretary; and Bill Maier, who is
12 our State Liaison Officer. Thank you.

13 Before I turn the meeting over to Pacific Gas &
14 Electric for their discussions on the insights and
15 perspectives that they have taken away from the December
16 22nd earthquake, I would just like to point out that our
17 purpose for this portion of the meeting is to understand
18 Pacific Gas & Electric's perspectives following the
19 earthquake, especially their analysis that was provided
20 in a special report made available to the NRC early in
21 January.

22 Based on our reviews of that report, NRC has
23 concluded that Diablo Canyon has been and continues to be
24 operated safely. We understand that Pacific Gas &
25 Electric intends to provide the NRC a revised report, and

1 we would like to understand what, if any, new information
2 the revisions may contain, and what they mean to the
3 continued safe operation of the facility.

4 So with that introduction, I would ask that
5 Pacific Gas & Electric go ahead and provide their
6 introductions. And if you would, please, continue with
7 your presentation.

8 MR. RUEGER: We'll start with our
9 introductions. I'm Greg Rueger, Senior Vice President,
10 Generation and Chief Nuclear Office of Pacific Gas &
11 Electric.

12 MR. OATLEY: My name is Dave Oatley. I'm Vice
13 President General Manager, with overall responsibility
14 for on-site activities at Diablo Canyon.

15 MR. CLUFF: I'm Lloyd Cluff. I'm director of
16 geosciences for PG&E.

17 MR. WOMACK: And I'm Larry Womack, Vice
18 President with Nuclear Services for PG&E.

19 MR. BECKER: I'm Jim Becker. I'm the vice
20 President, Diablo Canyon Operations and Station Director.

21 MR. RUEGER: I will start with our presentation
22 material.

23 As you mentioned, we have provided one report
24 that was provided to you shortly after the earthquake.
25 We are in the final versions of providing a supplemental

1 models.

2 He'll also talk about blind faults, as has been
3 a hypothesis that has been discussed in the community,
4 and we'll address that issue, and then talk about how the
5 plant structural performance was in this event.

6 After that, Jim Becker, our Vice President in
7 charge of operations at Diablo Canyon, will go through a
8 chronology and our lessons learned with regard to our
9 response to the event, talk about the actual event
10 chronology, and what that response was, what the
11 equipment performance was during the event, and then also
12 lessons learned from some analysis we performed, in terms
13 of what did we learn from that response, what
14 modifications should we be doing to our proceedings, as
15 well as to perhaps some equipment, so that we can respond
16 even better if we had a similar event in the future.

17 And lastly, I'm going to ask that David Oatley
18 be the man to draw some conclusions and summarize what
19 some of the findings are from our analysis. Next slide,
20 please.

21 Before we get into that, I do want to just
22 highlight some of the key points that will be made.
23 First of all, Diablo Canyon does have a very robust
24 earthquake design. The San Simeon earthquake did exhibit
25 characteristics that are typical for the area and were

1 report to you, with more information that we have
2 gathered since that time, and our analysis. It's still
3 undergoing quality verification. That's why it is not
4 out yet, but it will be shortly. We will go over, at
5 least in summary fashion, and be glad to answer any
6 questions you have of what will be found in that
7 supplemental report.

8 First of all, with the first slide here, this
9 will give you an idea of what we will be presenting
10 today. We have broken up our material into a number of
11 components. First of all, Larry womack, our Vice
12 President of Nuclear Services, will talk about Diablo
13 Canyon and the seismic design, go over some of the design
14 history for Diablo Canyon and the Design Basis with
15 regard to seismic activity, and also talk a little bit
16 about the Long-Term Seismic Program.

17 After Larry has completed his discussion, Lloyd
18 Cluff, our Director of Geosciences, will talk about the
19 San Simeon earthquake in particular. And what he'll be
20 discussing is what occurred. And then the context of
21 that, relative to historical seismic activity in the San
22 Luis Obispo area, he will make comparisons with the
23 Long-Term Seismic Program and tonic framework or model;
24 in other words, how did the earthquake we saw here
25 compare with what would be predicted and analyzed in our

1 anticipated in the tectonic on which Diablo Canyon's
2 design was based. The ground response of Diablo Canyon,
3 that we actually observed in this earthquake, was
4 actually less than predicted for this type of event, and
5 was actually very insignificant, relative to design of
6 the plant.

7 The Diablo Canyon structures did perform as
8 expected, and our response to the event, we believe, was
9 thorough, and there was no damage to equipment. And we
10 are incorporating lessons learned, so we will be going
11 through all of these, but I wanted to kind of summarize
12 some of the highlights of our observations and our
13 conclusions.

14 With that, I would like to turn it over to
15 Larry.

16 MR. WOMACK: Thank you, Greg. And I am going
17 to start off with a little bit of background regarding
18 Diablo's design. And I want to pick up on a point that
19 Greg made earlier, regarding the robust nature of
20 Diablo's design. And I also point the members of the
21 public that are here tonight to a page in the NRC handout
22 of materials provided, which in essence covers the same
23 elements I have on this slide.

24 Diablo is actually designed to several
25 earthquake requirements. And within the business, the

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1 first of these is described as the Design Earthquake.
 2 And in this particular case, our design requirement is to
 3 meet 0.20 g's acceleration. And for simplicity, I've
 4 only put the horizontal on this slide. In each case, for
 5 the DDE and Hosgri, the vertical component of design is
 6 roughly two-thirds of the horizontal, so I simplified it,
 7 so I need to start out with what is a g.
 8 G is a measure of acceleration. Most often, we
 9 see that in the form of gravity, that which holds us to
 10 the earth. And in terms of analysis for the facility,
 11 the g loading is important because it can be related to
 12 the force that acts on a piece of equipment, a structure,
 13 a person, anything that is responding to a seismic event.
 14 Let me move on.
 15 Diablo is unique. We do have a seismic reactor
 16 trip. What this is, is if the ground motion felt
 17 underneath the facility reaches a level of 0.3 g's or 30
 18 percent g, that would automatically trip the reactor,
 19 that would in turn trip the turbine generator and result
 20 in the plant being shut down.
 21 The next earthquake of design significance is
 22 the Double Design Earthquake, and there is no mystery
 23 here, that it's twice the Design Earthquake, at 0.4 g's.
 24 Both the Design Earthquake and Double Design Earthquake
 25 have some subtle differences that must be factored into

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1 the design of the facility.
 2 Next, and increasing in magnitude or size, is
 3 the Hosgri Event. This particular design requirement is
 4 for 0.75 g's, and is a quite substantial earthquake.
 5 Lloyd will get into a discussion of this later, relevant
 6 to the motion we felt during or as a result of the
 7 San Simeon quake.
 8 The last point on this slide is to mention the
 9 Long-Term Seismic Program. And it's important to
 10 characterize that the Long-Term Seismic Program is not a
 11 design requirement. It's a post-licensing commitment we
 12 made to the Nuclear Regulatory Commission to reevaluate
 13 the performance of our equipment and structures based
 14 upon a broader knowledge of both the earthquake potential
 15 of the Central Coast area and earthquake learnings
 16 worldwide. And again, I'll say a couple of words later
 17 about it, and Lloyd will also address it.
 18 Briefly, I just really wanted to indicate that
 19 -- the history of the seismic design for Diablo. This
 20 was originated in 1967. John Blume, a consultant to
 21 PG&E, very experienced in this area, developed the
 22 initial design. We kind of fast-forward about ten years
 23 to Hosgri, the discovery by the oil company geologists in
 24 the mid-'70s, early to mid-'70s, and subsequent
 25 determination that the Hosgri was capable of a

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1 7.5-magnitude earthquake.
 2 And I will point out, as part of the licensing
 3 review and approvals for Diablo, NRC and PG&E agreed on a
 4 Hosgri evaluation criteria that really superimposed or
 5 combined the input PG&E's consultant, John Blume,
 6 provided, and the input that Newmark, a consultant for
 7 the NRC, in the licensing proceeding provided, so it
 8 really became a superposition of both of those.
 9 Next, a couple of points about the Long-Term
 10 Seismic Program. It began with our commitment in 1984
 11 and lives on today, although as my second subbullet
 12 indicates, did culminate in 1991, with final review and
 13 approval by NRC.
 14 This program is very significant. There was a
 15 seven-year reevaluation. And if you don't mind, I'll
 16 just read what's on the slide, "of the geology,
 17 geophysics, seismology, ground motion, soils-structure
 18 interaction, structural performance." And it included an
 19 assessment of seismic margins through both deterministic
 20 and probabilistic analysis. All in all, this is the most
 21 comprehensive analysis done for a nuclear power plant in
 22 probably -- and Lloyd can comment on this -- probably for
 23 facilities within the world.
 24 As I said, NRC approved this report, this
 25 study, in 1991. And as the slide indicates, USGS acted

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1 as a consultant and reviewer for this through the term,
 2 through the seven-year term of the study, as did other
 3 parties, consultants to the NRC, National Laboratories in
 4 the United States.
 5 And probably most important, when I say that
 6 our LTSP goes on, that it's a living program, is that one
 7 of the commitments we've made is to look at significant
 8 earthquakes worldwide that will generate -- by their
 9 nature, will generate learnings that could be applied to
 10 the evaluation of Diablo's design and give us better
 11 insights as to the safety of the power plant. This
 12 remains a continued requirement for us, one that we
 13 regularly communicate with NRC on.
 14 With that, these conclude my remarks, but I
 15 would like to introduce Lloyd Cluff. And Lloyd, as Greg
 16 had said, will discuss PG&E's analysis of the San Simeon
 17 earthquake. But I think it is first good to share with
 18 you a little bit of Lloyd's background and experience.
 19 As Lloyd had said earlier, he is Director of
 20 the PG&E Geosciences department. He has been in that
 21 role since 1985. In that capacity, Lloyd manages two
 22 very important programs within PG&E. One of them is the
 23 Long-Term Seismic Program, so Lloyd is indeed our
 24 in-house expert. But the other is PG&E's Earthquake Risk
 25 Management Program, which looks across all PG&E

1 facilities and assesses the safety of those facilities,
2 our employees and our customs, so Lloyd has cast quite a
3 shadow within the company.

4 Lloyd also served as a commissioner and was
5 twice chairman of the California Seismic Safety
6 Commission, between 1985 and 1995. Prior to joining
7 PG&E, Lloyd was a vice president, principal and director
8 of Woodward-Clyde Consultants for the period of 1960 to
9 1985. And in that capacity was responsible for geologic,
10 seismologic, geophysical and earthquake engineering
11 activities, worldwide.

12 Lloyd has made some other notable professional
13 contributions that I would like to indicate. And first
14 among these is as a participant in numerous international
15 power plant siting missions for the International Atomic
16 Energy Agency in the years 1969 to 1985, and also served
17 as the Chairman of the Seismic Safety Review Panel for
18 the California Public Utilities Assessment of the
19 Proposed L&G facility at Point Concepcion.

20 These are just a couple of examples to really
21 indicate to the group here the experience that Lloyd has,
22 and are by no means representative of the many items I
23 can go through in introducing Lloyd.

24 So Lloyd, if you will take it away.

25 MR. GWYNN: I have a question on the point of

1 plant and its related facilities during the San Simeon
2 earthquake, and then summary conclusions.

3 The Long-Term Seismic Program, I won't read all
4 of this, but it's a little bit more detailed than what
5 Larry Womack just mentioned. It was a comprehensive
6 review of all of the geology, not just reviewing of what
7 was available, but we did a lot of additional study of
8 the faults and tectonics and earthquakes in the region,
9 of the seismology and geophysics, earthquake engineering,
10 and all of the aspects that go into understanding the
11 hazard, what the level of hazard is, and then how that
12 hazard is being accommodated into the design of the
13 structure, and then we did a probabilistic risk
14 assessment.

15 The next item is, as Larry mentioned earlier,
16 this extended over almost seven years, and the advisors
17 to the Nuclear Regulatory Commission included the U.S.
18 Geological Survey, not only for Menlo Park, but from
19 their Golden and Denver, Colorado offices and from
20 Reston, Virginia. Also, the University of Nevada had a
21 large contingent from their geologic group in Reno, and
22 then there were a number of professors from various
23 universities, and then all of the national laboratories
24 had a contingent that were involved in a very formal way.

25 During these almost seven years, we conducted

1 order. I anticipate that we may have some questions as
2 you go through this. Would you prefer that we ask them
3 as we have them, or that we ask them after you finish?

4 MR. CLUFF: I would say, have at it as I am
5 speaking.

6 MR. GWYNN: Okay. Thank you.

7 MR. CLUFF: Thank you, Larry.

8 As it's been mentioned, my name is Lloyd Cluff
9 with the Geosciences department. I will talk about seven
10 topics. The first one will be the activity of the faults
11 in San Luis Obispo County and surrounding region, as we
12 characterize it during a Long-Term Seismic Program. The
13 second item will be the tectonic framework or the model
14 that we developed during that period that we use to
15 continue to evaluate earthquake hazards and what
16 importance those evaluations might have to earthquake
17 risk at Diablo Canyon, and to put that information in
18 context with the San Simeon earthquake that occurred on
19 the 22nd of December, and look at how we looked at the
20 occurrence of an earthquake like the San Simeon in our
21 tectonic model. And then a consideration of blind faults
22 or blind trusts. This has been in the newspapers and so
23 forth. It is not a particularly new idea, but I'll show
24 how we have considered it in the past and how we are
25 considering it now. And then a performance of the power

1 60 public meetings, many of them in this very room, some
2 of them out at the power plant, some of them in San
3 Francisco, some of them in the field, after the Loma
4 Prieta earthquake in 1989, and then at Rockville.

5 Then PG&E, as mentioned, continues to monitor
6 earthquakes wherever they occur, local ones like the San
7 Simeon, or big earthquakes like the last big one that
8 occurred in Alaska in 2002.

9 This is the first map in a diagram that I need
10 to make sure that I don't go too fast. This is a block
11 diagram and a map looking at -- I've got a pointer here,
12 if I can keep it steady. The coastline starts here at
13 Point Concepcion, around San Luis Bay. Here is San Luis
14 Obispo. The power plant is right there. It goes around
15 to Estero Bay, and then up to San Simeon, and then around
16 to just off the map would be Montrey Bay.

17 On this map are shown the San Simeon fault,
18 that is mostly offshore, but it comes onshore just west
19 of the Hearst Castle area at San Simeon. And then that's
20 part of a broad zone of faulting that is mostly offshore,
21 and that fault zone connects with what we call a
22 step-over at this location, onto the Hosgri Fault, and
23 that continues southward and terminates where there is a
24 change in the topography of the coastline. And that's an
25 interesting story, but I won't take time to explain why

1 that happens.
 2 Then on this map also is the San Andreas Fault.
 3 Then you'll notice these little triangles. Those
 4 triangles represent locations where the U.S. Geological
 5 Survey has sensitive seismic instruments to monitor
 6 earthquakes. These are not ones that record motions or
 7 necessarily the shaking, for engineering. These are to
 8 detect where earthquakes are, what their size is, and
 9 what their mechanisms are. So the little triangles are
 10 the USGS stations. The big triangles that are closer to
 11 the coastline, extend from San Simeon down to the last
 12 one down here. There is 18 of those. That's a special
 13 seismic network that we voluntarily decided to put in,
 14 because there was concern about the paucity of stations
 15 from the U.S. Geological Survey and UC Berkley and
 16 Cal Tech, this is the area where all of those areas kind
 17 of come together, and there is a big hole here.
 18 And so we decided to try to help the situation,
 19 to put in this 18-station network, so these are
 20 continuously-recording seismometers. Marsha McClaren,
 21 who is here -- Marsha is in the front row right down here
 22 -- Marsha, wave your hand. She is our seismologist
 23 that's responsible for operating those stations, keeping
 24 track of all the earthquakes, and she interfaces with the
 25 U.S. Geological Survey's office in Menlo Park.

1 again, the San Andreas is well-known. And some of these
 2 other bigger faults are Rinconada and the Oceanic, and so
 3 forth. But the Los Osos Fault was the fault that was not
 4 known to exist, and we discovered it in our program. It
 5 is now part of the State considerations, as well as a
 6 number of others that I won't take time today to talk
 7 about.
 8 But let me show you where the earthquake
 9 occurred. That star that just came up, right there,
 10 that's the San Simeon earthquake, magnitude 6.5, and it
 11 occurred on the 22nd of December, so it's quite a ways.
 12 The earthquake itself was about a little over 50, 60
 13 kilometers from Diablo Canyon Power Plant. And then the
 14 aftershock zone, which I'll show in a moment, extended a
 15 series of earthquakes in the southeast, and the closest
 16 point was about 35 kilometers from the end of those.
 17 Next. Let's go back to that last one, because
 18 I want to show you that I took a helicopter and made an
 19 aerial reconnaissance some time ago, after the
 20 earthquake, to look at the effects of the earthquake.
 21 And I am going to show you images, mostly in the vicinity
 22 of San Simeon and Paso Robles, so all of the things I am
 23 going to show you are from the vicinity of the
 24 earthquake, none at Diablo Canyon.
 25 So the next slide shows a ground crack that one

1 And while originally we wanted to tie these in
 2 electronically, because of fire wall problems and all
 3 kinds of things, what happens when an earthquake like the
 4 San Simeon earthquake occurs, Marsha analyzes the data,
 5 shares that data on a daily basis with the USGS, and then
 6 we get together with the Survey and integrate all the
 7 data from our stations and their stations, to make the
 8 most accurate interpretation of where the earthquake was,
 9 how big it was, how deep it was, and what the
 10 characteristics of that earthquake have been. And we
 11 were in the process of doing that for the San Simeon.
 12 The earthquake that occurred, occurred right up
 13 here near San Simeon, just a little bit east of where the
 14 San Simeon earthquake comes offshore and connects with
 15 the Hosgri.
 16 The next slide shows a map that comes out of
 17 our Long-Term Seismic Program executive summary. This is
 18 a map of all of the active faults that we studied or
 19 discovered. Some of these were known prior to us
 20 starting a Long-Term Seismic Program. But about six or
 21 seven additional active faults were discovered by PG&E's
 22 program, that are in the vicinity of the Diablo Canyon
 23 Power Plant.
 24 Again, the coastline, I've shaded it here in
 25 blue, and the power plant is this dot right there. And

1 can see from the meadow into the trees. The initial
 2 interpretation by some geologists from the Geological
 3 Survey and others that were out there the first day -- I
 4 was in constant touch with the USGS and was prepared to
 5 grab a helicopter and go down, if they found something of
 6 significance. The fact that this earthquake was so far
 7 away, and we had already modeled earthquakes like this, I
 8 wanted to wait and see what they were finding, before we
 9 spent time in the field.
 10 And they told me the first night, they found
 11 some ground cracks. They didn't know what they were.
 12 They could be surface faulting. But as it turned out,
 13 they have interpreted these, and I've looked at these in
 14 the field as kind of incipient cracks that have relations
 15 to ground cracking, due to intense shaking that's kind of
 16 like a small landslide. It hasn't really moved in a big
 17 landslide, but it's a crack that with further shaking and
 18 further ground or water infiltration from rainfall could
 19 end up having part of this hill slide by the force of
 20 gravity, or triggered by another earthquake.
 21 The next slide shows -- the light here isn't
 22 really conducive to seeing these features -- but there is
 23 a series of cracks right here, and then another series of
 24 cracks over here. In some places, these cracks line up
 25 along where some people would say the Oceanic Fault comes

1 to the surface. I don't know whether this is at one of
 2 those places, but they were like this.
 3 I was in the helicopter with Lou Rosenberg, who
 4 was the County geologist. He had already been out, so he
 5 was very helpful in taking us to where he had seen these
 6 same features. And all of the geologic interpretations
 7 by the State of California and the U.S. Geological Survey
 8 are these, are shaking-induced cracks that are related to
 9 ground failure, and not surface fault displacement. This
 10 is kind of behind what some people have said, "Well, the
 11 fault didn't break to the surface; therefore, it's a
 12 blind fault." That's a fault that doesn't make it to the
 13 surface. I'll talk more about that later.
 14 The next slide shows a view of where -- the
 15 epicenter is east of Hearst Castle, over in this area
 16 here. Actually, over that ridge a little bit. Hearst
 17 Castle got a very strong jolt. And the next slide shows
 18 a close-up of the Hearst Castle. That site is conducive
 19 to very strong earthquake activity, due to its being
 20 perched on the top of a sharp ridge. Topographic
 21 amplification is very significant, so when you have a
 22 site like this, you need to make sure that it's
 23 well-founded into the rock, which it is. And Julia
 24 Morgan, the architect, and engineer that she worked with,
 25 had experienced the 1906 earthquake, and they drilled

1 deep footings into the rock and made this a very good
 2 structure. If we were to compare it with Diablo Canyon,
 3 it would probably be about a fourth of the design of
 4 Diablo Canyon, I would judge. But nonetheless, it
 5 survived without any structural effects whatsoever. They
 6 did have some loss of some of the artifacts that are
 7 stored in the estate, the museum, that were a loss, but
 8 there was no structural damage or any breakage of the
 9 facility at all.
 10 Next. Let's look at Paso Robles. This is
 11 where the two people were killed in this partial collapse
 12 of this unreinforced masonry building. You see a lot of
 13 other buildings here. And with close inspection, there
 14 were more than a hundred buildings that suffered some
 15 damage, some pretty severe.
 16 The next is a slide of a close-up of -- you can
 17 see the unreinforced masonry walls still standing here,
 18 but bricks scattered all over, a car that's crushed down
 19 below. And this is where two people lost their lives.
 20 We knew this was going to happen to these kinds
 21 of buildings. There are literally thousands of those
 22 very vulnerable, unreinforced masonry buildings in the
 23 older parts of our cities, including San Luis Obispo, and
 24 still more in Paso Robles and other places -- Berkley,
 25 San Francisco, Oakland, Los Angeles. And we are having a

1 difficult time, when I was on the Seismic Safety
 2 Commission, in trying to get people to be responsible for
 3 cleaning up this kind of a problem. It's a big political
 4 problem, a lot of resources are needed. Really, these
 5 kind of buildings should be demolished and rebuilt, but
 6 there is a historical preservation issue that tries to
 7 keep the building. And so there are all kinds of public
 8 issues that come around. But eventually, earthquakes are
 9 going to do it for us.
 10 Next slide. So flying over Paso Robles, a lot
 11 of buildings come through without any damage. There are
 12 a lot of things. This is a modern building and, of
 13 course, experienced the same level of shaking, and had no
 14 serious effects.
 15 Next. So coming back to that long-term seismic
 16 map, I pretty well described the map, other than there is
 17 a little inset map that I'll show an enlargement of in a
 18 moment, but that's our tectonic model. This is a section
 19 of this map in here, and we've defined a major structural
 20 block that is responding to the plate motion on the
 21 San Andreas Fault, and then there is a big fault over
 22 here called the Garlock Fault, that comes here. And
 23 that's why this bend in the coastline is there. And that
 24 interaction is rotating and uplifting the whole
 25 California coastline.

1 The next slide shows the historical seismicity.
 2 This map covers earthquakes from 1830 to 1991. And these
 3 are felt reports. In the early days, in the 1800s, there
 4 were no seismic instruments. I think the first seismic
 5 instrument was in the late 1800s up on Mount Lick, Mount
 6 Hamilton and Lick Observatory. But nevertheless, through
 7 felt reports, the shaded ones are probably accurate,
 8 within 0 or maybe even 10 kilometers. And the open
 9 circles, like some of the other bigger ones that have
 10 occurred in this area, are not quite as accurate. But
 11 still, they've been assessed, and they think they're
 12 still pretty good picks of where the earthquakes
 13 occurred.
 14 The size of the image gives you an idea of how
 15 big they have been. So there are some earthquakes the
 16 same size as the San Simeon. The San Simeon is right
 17 there. I'll show you in a moment. Just leave it there,
 18 Larry, for a moment.
 19 AUDIENCE: Can we turn the lights down so we
 20 can actually see the image?
 21 MR. CLUFF: That might be a good idea.
 22 Can we darken these lights up here?
 23 That's better. Maybe those two floodlights
 24 that are shining on the screen.
 25 Well, that's better.

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1 Much better.

2 So here is the coastline again. Diablo Canyon

3 is right there, where the pointer is pointing. And then

4 Estero Bay is here and San Simeon is there. And these

5 earthquakes are large earthquakes, some of which were

6 bigger than the San Simeon earthquake.

7 The next slide shows the same slide with the

8 San Simeon earthquake on it, so I can see a 6.5-magnitude

9 earthquake occurred in an area. And the mechanism on the

10 earthquakes that were there before were reverse slip and

11 strike slip, both. But the ones up in here, there is one

12 right here that I can't read it, but I know it's 1991.

13 This occurred when we were in this room in a hearing on

14 the Atomic Licensing Board, the final one in 1991, and a

15 magnitude 5.2 earthquake occurred right there. And these

16 chandeliers in this room were shaking all over, and we

17 immediately got our data to tell the Board where the

18 earthquake was and what the motions were.

19 So that earthquake was a reverse-slip

20 earthquake. So was the San Simeon, a reverse mechanism.

21 So this area clearly had been modeled by us in previous

22 earthquakes as an area with reverse-slip earthquakes.

23 Let me just talk about the tectonics of

24 reverse-slip earthquakes for a moment. The San Andreas

25 Fault and the Hosgri Fault are pretty straight,

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1 near-vertical faults. And most of the earthquakes on

2 them are strike slip in nature. And that's been pretty

3 well proven by the work that the U.S. Geological Survey

4 has done and we have done.

5 And then, there are the other faults that you

6 see on this that are more northwest, southeast in the

7 stripe, the trend of these. About a 30- to a 45-degree

8 angle to the San Andreas or the Hosgri Fault.

9 Now, when you, just by the geometry of that

10 weak plane, and then the stress that comes from the plate

11 boundary of the San Andreas, this area is under

12 compression. The near-straight faults, like the

13 San Andreas, slip lateral, and these at an angle slip

14 vertically. It's pretty simple, but in many ways, very

15 complex. So we have both reverse-slip faults and

16 strike-slip faults.

17 And the next slide will show the seismicity

18 that was recorded on the PG&E network from -- for a

19 ten-year period, '87 to '97. And again, I'll show the

20 coastline. Here is San Luis Bay. Diablo Canyon is here,

21 so San Luis Bay is down here. This is Estero Bay, and

22 San Simeon up here. And you can see, from these little

23 dots, here is the symbol for the size of the earthquake,

24 these are much smaller. They are up to about magnitude

25 4.5 or so. But these are earthquakes that are controlled

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1 on their location by PG&E with interface with the USGS.

2 And you can see a whole string of earthquakes

3 aligned directly along the Hosgri Fault. Even though we

4 recorded earthquakes along the San Andreas, we are not

5 showing them, because that's too far away. But these all

6 have strike-slip mechanisms, pure strike slip along the

7 Hosgri system.

8 The faults that are angled at an angle, like

9 the Oceanic Fault and a number of the other faults, are

10 reverse mechanism. So the fact that the Oceanic Fault --

11 that we think that was associated with this earthquake --

12 is a reverse-slip fault, was expected. This was not a

13 surprise to anyone who knows these kinds of data. Next

14 slide.

15 So there is the star of the San Simeon

16 earthquake, right in the area where Marsha's

17 interpretations of this over this ten-year period clearly

18 document reverse mechanisms in that area. Next slide.

19 So this is a map showing the aftershock

20 sequence. Again, the coastline, Diablo Canyon,

21 San Simeon here. The main shock occurred, this red dot

22 up here, and then the blue and the orange and yellow ones

23 are the sequence. This is up and through January the

24 5th. Several-thousand earthquakes.

25 Marsha, what, about 3,000 now, or more?

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1 MS. McCLAREN: There is about 1500 in that

2 two-week period.

3 MR. CLUFF: Two-week period, but now we've had

4 about almost double that, I would say.

5 So the magnitude of some of the bigger ones

6 were up a little over 5. And you can see that they

7 started up here with the main event, and then kind of

8 expanded to the southeast. And the lines across this,

9 perpendicular to the faults, are cross sections. I am

10 going to show you one cross section that's a section

11 through the earth. In other words, this is looking at

12 the face, the ground surface is up here. This is down to

13 almost 15 kilometers down here. And then the distance is

14 along here in kilometers, so we are looking at a section

15 of the earth's crust, as if we would slice with a big

16 knife. We are looking along at almost 20 kilometers on

17 this side, and 12 to 14 kilometers on the vertical side.

18 This is where initially the USGS interpreted

19 the location of the main shock. And then a lot of the

20 aftershocks at this cross section are scattered along

21 this area. Marsha has been integrating some of the USGS

22 data with her data, and it looks like that aftershock

23 will probably end up down here at this great a depth,

24 once it's all integrated with the USGS data. Our network

25 recordings are much more accurate than the distant USGS

1 recordings, but they will all be integrated by us.

2 Larry, hit that button twice more.

3 Here is my interpretation of where one might
4 draw a line, whether it be here or over here somewhere,
5 or up here is immaterial. What it shows is it matches
6 the focal mechanism that's calculated from the motions
7 that Marsha and the other seismologists are doing. And
8 the arrows on this indicate that this block went
9 relatively up, with respect to the block on the other
10 side of the fault. And so that's called a reverse-slip
11 fault.

12 And the dip of that fault plane, as we would
13 interpret it here, is about 50 to 60 degrees. And prior
14 to the San Simeon earthquake, we had stated in the work
15 that we did, under the Long-Term Seismic Program, that
16 the angle of dip of the Oceanic Fault was about 60
17 degrees. So we feel pretty proud that we had this pretty
18 well nailed prior to this earthquake, and it was not a
19 surprise that this kind of a mechanism occurred in this
20 location. Next slide.

21 So coming back to that block diagram of our
22 stations and the coastline, our next step now is to work
23 with the USGS. All the data you see on the USGS website
24 is purely preliminary. A lot of those epicenters will
25 move around and be at different depths, and so forth. So

1 once we give them all of our data, and Marsha is already
2 doing that now, and we integrate that now, we will come
3 up with a master interpretation, which we and the USGS
4 will adopt. And that will be in a future report that we
5 will be sending to the Nuclear Regulatory Commission, on
6 the seismology of this earthquake. It will also include
7 geologic observations as well, but that's going to take a
8 while to have us do that.

9 And Goodum can tell you that we've always done
10 this in past earthquakes when something like this has
11 happened. In a few months, we gather all the data and
12 then send another report on these events. Not only here,
13 but when we investigate an earthquake somewhere else in
14 the world. Next slide.

15 MR. BAGCHI: May I ask a simple question here?

16 MR. CLUFF: Yes.

17 MR. BAGCHI: Given so much discussion in the
18 local press, do you now feel that the difference there
19 was -- between your postulation of completely strike slip
20 and a very small component of reverse slip at the Hosgri
21 Fault, does that need any reinterpretation, or are you
22 still working on that?

23 MR. CLUFF: Well, there have been opinions all
24 over. I saw in the paper the other day there are some
25 scientists who would still argue that the Hosgri Fault is

1 not a strike-slip, but it's a reverse or a thrust fault.

2 That was the main objective of the Long-Term Seismic
3 Program. We actually did geophysical surveys offshore,
4 clear off to the continental slope. We spent about \$15
5 million gathering additional data on the geophysics, the
6 geology. And at the end of that, we concluded that the
7 preferred interpretation -- and the U.S. Geological
8 Survey agreed with us -- was -- primary slip on the
9 Hosgri is vertical.

10 That data, with additional data from our
11 recordings and the USGS recordings, and a lot of oil
12 field exploration, is in publication as we speak. Marsha
13 McClaren is one of the authors. There are four or five
14 authors, geophysicists, geologists. And that will be the
15 definitive paper. I can tell you it has concluded that
16 the -- proves the Hosgri is a pure strike-slip fault.
17 And the USGS is publishing that in a professional paper,
18 which is the highest caliber of paper publication in the
19 survey. That will be finished within the next few
20 months.

21 There are several other papers in the works
22 that address this. And we're always looking for
23 additional data. The San Simeon earthquake will be one
24 that we will look at and say, "Okay. What does this tell
25 us about the regional tectonics?" And the fact that we

1 had already characterized the area with the San Simeon
2 earthquake as a thrust mechanism, doesn't add much to the
3 Hosgri style of faulting interpretation.

4 So we are always open to new data. And when we
5 get new data, we will change our minds, if we are
6 convinced there is valuable data.

7 So the next slide is the tectonic model that
8 again, the coastline, the coastline is behind these
9 intense colors, so the line terminates at the Hosgri.
10 And that's the western boundary of what we call the
11 Los Osos/Santa Maria domain. It's a structural term for
12 geologists. And the other boundary just north of Santa
13 Barbara, on one of the big faults down there. And then
14 the east and northeast boundary is the Oceanic West
15 Huasna Faults, which is the boundary of that tectonic
16 block. And by nature, in that this is being uplifted
17 very slowly, we measured the rates as being -- of uplift
18 as being around a half a millimeter to three-quarters a
19 millimeter per year. That's very slow. Where the
20 San Andreas is slipping at about 40 millimeters per year,
21 the Hosgri is slipping at about 1 to 3 millimeters per
22 year.

23 And so this is this area, in compression and
24 strike-slip motion, is uplifting this crustal block
25 within the earth, kind of as a block, but it has other

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1 faults that have little earthquakes in it, that will go
 2 off every once in a while. But this shows that -- this
 3 comes out of our 1998 report, that this Oceanic part is a
 4 reverse-slip fault. And we've termed it an active or
 5 capable fault, by the definition of the Nuclear
 6 Regulatory Commission.
 7 So, as I've noted there on the side in writing,
 8 that the model allowed this to be a reverse-slip fault on
 9 that northeast boundary. So there is the star for the
 10 earthquake, and there is the San Simeon earthquake right
 11 on that area, up where it intersects with the San Simeon
 12 earthquake. Next slide.
 13 Now, there has been talk about blind faults,
 14 blind thrusts, and I said what they were. They are
 15 earthquakes that occur, and the fault never comes to the
 16 surface, for a whole set of reasons. One is the focal or
 17 hypercenter, the depth in the crust of the earth is too
 18 deep for the slip on the fault to reach the surface. All
 19 earthquakes are caused by slip on fault in some way. But
 20 sometimes, the slip isn't big enough to reach to the
 21 earth's surface.
 22 So nevertheless, in 1990, around, a couple of
 23 researchers from Southern California postulated this
 24 blind-fault hypothesis in this region. One of their
 25 cross sections was near our area, and so we decided to

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1 model this. We did what we call the blind-fault
 2 hypothesis during the LTSP. And we actually made the
 3 conservative assumption that this shaded area, which is
 4 directly beneath the power plant, was the ramp that would
 5 release an earthquake right under the power plant. And
 6 when you compare the energy from that earthquake with the
 7 red zone, which is the Hosgri Fault, there is no
 8 comparison.
 9 Next slide shows our conclusion is that the --
 10 it's the -- shows the Hosgri Fault, even when we have a
 11 blind thrust or ramp directly beneath, the Hosgri Fault
 12 continues to control the earthquake input at Diablo
 13 Canyon. So it's kind of a so-what kind of result. We
 14 did model it. Since various researchers are talking
 15 about the San Simeon earthquake being a blind-reverse
 16 fault, we will reevaluate that and see what sense it
 17 makes. But we'd already characterized it, and it's so
 18 far away, it doesn't make that much difference to Diablo
 19 Canyon. It makes a huge difference to Paso Robles. And
 20 as some geologists have hypothesized, there could be the
 21 potential for one of these ruptures to occur right under
 22 San Luis Obispo. That would mean you'd better get busy
 23 fixing the unreinforced masonry buildings. Next slide.
 24 MR. BAGCHI: Now, let me just ask a point of
 25 clarification.

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1 MR. CLUFF: Yes.
 2 MR. BAGCHI: Is it because of the length of the
 3 fault, the blind thrust is so much smaller, compared to
 4 the Hosgri?
 5 MR. CLUFF: That's part of it, yes. The
 6 Hosgri, we are only showing a section of the Hosgri. The
 7 Hosgri is a little over a hundred kilometers long. The
 8 full length of this ramp is -- there is a scale up there,
 9 but I can't quite read it. It's, what, about 10
 10 kilometers or something?
 11 MR. SATORIUS: 15 kilometers.
 12 MR. CLUFF: 15 kilometers. So maybe that's
 13 about 30 kilometers, or even 40. But then you can see
 14 these lines in here. There is geophysical constraints
 15 that segment this system, that if it did release an
 16 event, it probably wouldn't rupture the whole thing.
 17 It's clearly terminated by this boundary here and the
 18 Hosgri over here. In fact, if you believe that ramp is
 19 there, it's real, the Hosgri Fault would be inactive, if
 20 that existed.
 21 So the hypothesis is that if, in fact, it does
 22 exist, it doesn't matter to the ground shaking. And if
 23 it really exists, it, by the rules of doing the modeling,
 24 you would have to say the Hosgri Fault is not an active
 25 fault. So you can't have it both ways. We want to adopt

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1 the most conservative interpretation for the work that
 2 we've done.
 3 MR. JONES: Mr. Cluff, if we were to assume
 4 that it was active, what would be the ground
 5 accelerations that would be experienced at the site?
 6 MR. CLUFF: From what?
 7 MR. JONES: From the blind --
 8 MR. CLUFF: From the blind thrust? Let me
 9 describe the characters that influence the ground
 10 acceleration. It's the size of the earthquake, the depth
 11 of the earthquake, the travel path from the hypercenter,
 12 up through the site, and then the site conditions. So
 13 when you take all those considerations into account, the
 14 plant is on rock, that's a good piece of news. That
 15 lessens the intensity of the shaking. The distance to
 16 the earthquake that would be on this, by the constraints
 17 of the model that is there, puts this, at the closest,
 18 about 6 1/2 kilometers beneath the plant. And probably
 19 is down around 12 to 15 kilometers. So by nature of
 20 that, it's much farther away.
 21 And then the size of the earthquake, we
 22 believe -- and others who reviewed this -- that it
 23 probably wouldn't rupture more than just this 15
 24 kilometers. It probably wouldn't be much over a
 25 magnitude 5.5, but we allowed that it could be as high as

1 6.5, like the San Simeon. And still, that didn't produce
 2 a ground motion that was anywhere near the Hosgri.
 3 I've forgotten the exact numbers, but it's in a
 4 response to the question from the Nuclear Regulatory
 5 Commission. And all of this diagram, I just scanned in,
 6 out of our response to the Nuclear Regulatory Commission.
 7 Next slide. So let's go now to talking about
 8 the ground motions and the response of the power plant
 9 structures. Here is what we call an attenuation relation
 10 plot. Now, what this is, is it's strictly a log-log
 11 scale that shows a plot zeroes down here, even though
 12 it's a 1, and then .001. So on this side, it's the
 13 percent of gravity and acceleration, so it goes up to 1 g
 14 there, and is down to almost nothing down here.
 15 And then distance from where the earthquake
 16 occurs on the fault, and this goes out to a hundred
 17 kilometers. So what you do is you take worldwide data
 18 for various types of faults and various types of site
 19 conditions, and you plot them up. And that's what all
 20 these words are in here. We use the Sadigh rock and the
 21 Sadigh soil model for the ground motion. And this blue
 22 and red are the median values of what you would expect.
 23 So what you do is you use this model and you
 24 say, "If an earthquake occurred like we had at San Simeon
 25 at about the closest point, about 30 kilometers away, we

1 would predict, from this median value, that we should be
 2 getting an acceleration of about 12 to 15 percent g at
 3 Diablo Canyon power plant for this size of an
 4 earthquake."
 5 This X shows what we recorded. It was 5
 6 percent of g, much lower than what we would have
 7 predicted. Had someone asked us the day before, "What
 8 would be the ground motion at the plant," we would have
 9 said 10 to 15 percent. Well, that's the uncertainty in
 10 these kinds of models. This doesn't matter that much.
 11 It's just a variation. You can see higher values over
 12 here on the other side. This is over near Parkfield.
 13 These are USGS strong motion recording
 14 stations, and they show accelerations way above, even two
 15 sigma levels above what the median is, and that shows the
 16 variation in the ground motion. And it's probably
 17 influenced by what we call "fault rupture directivity."
 18 The fault tended to rupture to the southeast, and it
 19 probably focused some energy off toward the San Andreas
 20 Fault and where those recorders are. That's my quick
 21 interpretation right now. We'll be hearing about this
 22 from the USGS, when they publish their data. But that's
 23 how I would look at this.
 24 This doesn't surprise us, that it was a lot
 25 lower than what we would have predicted, but we like to

1 show that we were conservative. That's really the
 2 important thing to get out of this.
 3 MR. BAGCHI: Lloyd, just one observation here.
 4 MR. CLUFF: Yes.
 5 MR. BAGCHI: We do have a program that we use
 6 sometimes, using the information about the magnitude of
 7 earthquake and the coordinates, the latitude and
 8 longitude of where it happened. And based on that input,
 9 we have two models of how the ground motion would spread
 10 from the source to the site. And based on that, we had
 11 two values. One was .04 g, and another one was .05 g.
 12 MR. CLUFF: That's very interesting. That's
 13 because the models that you are using are probably
 14 Sadigh's model, or one of his models that's in there.
 15 There is Endrus models, Sadigh models, Joyner & Boar
 16 models. They would all give you similar answers.
 17 MR. BAGCHI: Joyner & Boar is in there.
 18 MR. CLUFF: Joyner & Boar is probably what he
 19 used. And it would give you -- and so that's good,
 20 independent confirmation, but they all come from the same
 21 kind of model so that would be expected, but thank you
 22 for that comment.
 23 So at any rate, so what you can do is just play
 24 the what-if on this, any time you want. You can see that
 25 if you are very close, according to this model, if you

1 are very close to where the earthquake started or the
 2 fault started rupturing, you can get 1 g accelerations.
 3 And we've seen in excess of 1 g accelerations.
 4 Northridge had some accelerations in excess of 1 g. And
 5 the big earthquake in Alaska a year and a half ago had
 6 some big accelerations off in some distance, so that
 7 happens. But it doesn't necessarily mean that that's the
 8 most dangerous place to be. Depending upon the site
 9 conditions, the soil, how it might amplify the motions on
 10 the top of a ridge, or how the structure is built. So
 11 there are a lot of variables that have to come into
 12 account that we -- you regularly use in all of our
 13 structures at PG&E. So the next slide.
 14 This is the response. The upper spectrum, you
 15 heard Larry Womack talk about the Hosgri and the Blume
 16 Newmark. This is what we call here the DCP design
 17 spectrum, but it includes also the Hosgri. This little
 18 bump that -- we call it "The Hat," that was when Newmark
 19 and Blume combined their spectra, and so that was the
 20 result. And so you can see that this is the capacity.
 21 Any line that is below this would not have the potential
 22 of doing any damage. And even excursions above this
 23 line, would have to be way above the line before it would
 24 be serious damage.
 25 The blue line down at the bottom is what the

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1 San Simeon earthquake produced at the Diablo Canyon
 2 Free-field station, 5 percent g, so you can see where, up
 3 here, this is anchored at .75 g, over here, and the
 4 spectral acceleration goes up to a little over two and a
 5 quarter g for the design of the plant.
 6 Almost all of our power block structures are
 7 within this band from -- this is in Hz, about two Hz out
 8 for about 8 Hz, or from about 2/10ths of a second period
 9 to about 8/10ths of a second period. That's where most
 10 of our power block structures are.
 11 Next slide shows the summary of conclusions.
 12 The upper point I made here is that the San Simeon
 13 earthquake characteristics were not a surprise to
 14 scientists, geologists and seismologists who had studied
 15 this area, including our group and folks with the U.S.
 16 Geological Survey and the National Laboratories. And the
 17 earthquake occurred where numerous historical earthquakes
 18 have occurred, with similar mechanisms.
 19 The next bullet shows the earthquake was
 20 associated with in the LTSP. It was identified, the
 21 source of it was identified in the LTSP as an
 22 active-reverse. And also nearby were strike-slip faults,
 23 so we had both mechanisms. And in this case, the other
 24 side, we found it was a reverse slip. The mechanism was
 25 similar to all the historical records, where the

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1 San Simeon earthquake occurred, as we had characterized
 2 it in the LTSP.
 3 And the next slide shows the structural model
 4 evaluation. We did it in two ways. The observed
 5 response of the structures, where we took the recordings
 6 of the structural response, and then we evaluated the
 7 structural models that we used in the design of the power
 8 plant, as well as in the LTSP comprehensive review. And
 9 during that review, we did change some of the models and
 10 improved them, because they were pretty crude early on,
 11 and a lot better modeling techniques were available when
 12 we did that work. And it had to do with natural
 13 frequency and the spectral amplification.
 14 The next theory shows the accelerometer
 15 locations on the containment structure basemat and at the
 16 top of the dome of the containment structure, and the
 17 auxiliary building foundation, and also up in that
 18 structure, at 100-foot elevation. And then also in the
 19 turbine building basemat.
 20 The next slide --
 21 MR. SATORIUS: Could I ask a question?
 22 MR. CLUFF: Yes.
 23 MR. SATORIUS: Those are the locations for the
 24 seismic accelerometer?
 25 MR. CLUFF: For some of them, yes.

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1 MR. SATORIUS: And all of those accelerometers
 2 are the instruments that you use in developing your
 3 special report; is that correct?
 4 MR. CLUFF: Yes. We have analog instruments
 5 and digital instruments, and we are right now in the
 6 process of putting everything digital and getting rid of
 7 the analog.
 8 MR. SATORIUS: Were all of those instruments
 9 used in the report that we received early in January?
 10 MR. CLUFF: Larry, you want to go ahead and
 11 take that.
 12 MR. WOMACK: Let me go ahead and take that.
 13 No, they were not. And due to the nature of
 14 the report being completed by the Regulatory requirement
 15 in 14 days, we included information in that report with
 16 regard to one of the sensors, the containment structure
 17 basemat. And again, looking at the Regulatory
 18 requirements, the time that is available, that's what was
 19 included.
 20 As we indicated when your inspector was on-site
 21 a couple of weeks after the earthquake, we would be
 22 making an additional report, or supplementing the 14-day
 23 report. We are currently preparing that, and it is
 24 nearing completion. And in fact, some of the conclusions
 25 that Lloyd communicated here come from that report, but

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1 it unfortunately is not available here today. It will be
 2 out shortly. It will include all of that information.
 3 MR. SATORIUS: Are you prepared to give us a
 4 sense tonight as to whether the inclusion of those
 5 additional accelerometers come to a conclusion in the
 6 report?
 7 MR. CLUFF: Yes.
 8 MR. SATORIUS: I'd appreciate hearing that.
 9 MR. CLUFF: Okay. Let me give an overview, and
 10 then Larry can probably add to that.
 11 MR. JONES: Mr. Cluff, before you move on to
 12 the actual response of the facility, Has the review of
 13 the information from the USGS and yourselves and
 14 Cal Poly, have you identified any other faults, based on
 15 the information you've looked at so far, that would
 16 indicate there are other faults in the San Luis Obispo
 17 area that were, until the San Simeon earthquake, were not
 18 identified?
 19 MR. CLUFF: Well, until you identify them, you
 20 don't know whether they are there. As we did the
 21 Long-Term Seismic, as I think I mentioned earlier on, we
 22 discovered about seven -- in the region, about seven
 23 active faults that were not known previously. And one of
 24 them goes right in front of the San Luis Bay Inn, where
 25 all of the hearings were held on the '70s. No one had

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1 ever looked there. It was kind of covered with brush.
 2 And it's a minor fault. It turned out to be not
 3 significant, but it hadn't been identified.
 4 I would judge, based on my experience in
 5 looking at active faults, in a lot of tectonic
 6 environments and looking at earthquakes, that there is
 7 always going to be little faults that when you look
 8 closer in some places, you might find them. But I would
 9 say that we have identified the ones that are really
 10 important. And the others that might be found, would
 11 have no significance to the structural integrity of our
 12 power plant.
 13 MR. JONES: Thank you.
 14 MR. CLUFF: So we have recordings in these
 15 places that we look at these accelerometers in how we
 16 modeled it and then the responses, and maybe the next one
 17 gets into that.
 18 Free-field ground motions. The ground response
 19 to the power plant was, as I showed, was less than
 20 predicted. And then the next bullet was the structural
 21 responses; now here is where I can elaborate, and then
 22 Larry might want to add to what I say.
 23 The structural responses, the power plant
 24 structures behaved as we had expected and modeled them.
 25 And it provided confirmation that the models used in the

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1 design and so forth were accurate, and it did it in two
 2 ways. One, in the frequency characteristics, where it
 3 peaks, and the next -- I don't know whether I have
 4 another bullet on this or not. No, I don't. So that's
 5 the end of my presentation.
 6 In the report, I was reviewing a draft of the
 7 report yesterday. And so in that report will be some
 8 figures that will show the recordings, and you will be
 9 able to see that the frequency content of our model and
 10 the frequency was at about, I think, 4 1/2 Hz, right
 11 where we had modeled it. And then the amplification
 12 varied, and there was a lot of uncertainty on it, but it
 13 was in the same area, so it shows that we were using that
 14 model. But there is all kinds of things that Larry will
 15 talk about, in terms of damping factors. We are looking
 16 at a small earthquake at a great distance. And to look
 17 at recordings from that, you can't directly compare a
 18 large Design Earthquake that's on a nearby fault, and so
 19 the behavior would be quite different.
 20 Larry.
 21 MR. WOMACK: Lloyd, I think you really said
 22 most of what I would have said. And I would just add one
 23 word, that as we look at the analysis, the spectral
 24 analysis, looking both at the base of containment, the
 25 top of containment, and just use that as an example here,

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1 we see that they are consistent with the models that were
 2 developed and used in the original design, and to support
 3 the licensing of the facility. We have seen nothing
 4 anomalous in our review. So in fact, that is what I
 5 expect we will be reporting as a part of our supplemental
 6 report.
 7 In turn, as Lloyd mentioned earlier, some time
 8 is necessary for the USGS and PG&E to integrate the body
 9 of data that is available here, so we will anticipate --
 10 it's hard to predict when that will be complete -- but
 11 probably within the next two to three months, submitting
 12 a further follow-up to characterize the best knowledge at
 13 that time.
 14 And to use an example, one thing Lloyd
 15 mentioned earlier is initially USGS located this
 16 earthquake, the initiating earthquake, at a depth of
 17 approximately 7 kilometers. Subsequent study is now
 18 indicating, or subsequent evaluation of the data is now
 19 evaluating and determining that that's more like a depth
 20 of 10 to 11 kilometers, so we would expect to capture
 21 that kind of additional analysis in those future reports.
 22 MR. BAGCHI: With respect to the structure
 23 behavior, I would like to explore the possibility that
 24 the plant, having been there for so many years -- is
 25 there any indication that the degradation could influence

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1 the response and somehow be weakened by this San Simeon
 2 ground motion?
 3 MR. WOMACK: I'm not sure I entirely understand
 4 the question, but let me take a shot, so let me start by
 5 repeating. Diablo and its structures have been on the
 6 site for quite a period of time. Structures and
 7 equipment can degrade if not maintained, so is there
 8 anything that we've seen that would indicate a
 9 degradation of the structure, and a change in the
 10 response to the structure as a result of the time our
 11 buildings and our equipment have been there. Is that a
 12 reasonable characterization?
 13 MR. BAGCHI: That's a fair characterization,
 14 yes.
 15 MR. WOMACK: First, I'd start off, as we
 16 indicated, that the input ground motion, and using that
 17 input ground motion in our building evaluation model,
 18 indicated that the building vibrated or responded at the
 19 right frequency when we looked and evaluated that at the
 20 top of containment. So intrinsically, that tells you
 21 that the structure of the building has not degraded
 22 substantially; otherwise, the frequency at the top would
 23 be different than our analysis would predict.
 24 In addition -- and I'm certain that the NRC is
 25 aware of this -- but for the public that is here, we have

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1 many, many requirements in our license and additional
 2 programs that we utilize to monitor the performance of
 3 the power plant, both its structures and its systems, on
 4 a regular basis. Probably at the top of that list is the
 5 maintenance rules, and CFR 50.65, and in particular our
 6 application of maintenance rule principles to our civil
 7 and architectural structures. We monitor that. We have
 8 in essence, a system engineer, design engineer that
 9 follows that quite closely. And to my knowledge, we have
 10 not observed any degradation.

11 MR. BAGCHI: That's a pretty good answer.
 12 If you had been able to detect the natural
 13 frequency of the building from your recording, this is
 14 something I was not aware of. If you have been able to
 15 determine, from the amplification response, the natural
 16 frequency signature, then, of course, that's a fair
 17 indication that model that predicted the natural
 18 frequency has been observed in actual ground motion,
 19 recorded motion at the plant.

20 MR. WOMACK: Thank you. I look to Lloyd, and I
 21 look to other members of my staff that are here tonight,
 22 and I think I've gotten that one right. I am looking to
 23 my civil engineers.

24 MR. SHUKLA: It's nice to say that the
 25 earthquake was predicted and the plant behaved as

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1 expected. But how would you translate this into safety
 2 aspects? Are you saying that earthquake was well below
 3 the design of the Diablo Canyon Power Plant? How would
 4 you do that? I mean, in terms of safety.

5 MR. WOMACK: Well, let me start off, and then
 6 maybe Lloyd or others here might want to add to it. I
 7 think it first starts with the initial slide that Greg
 8 Rueger put up; that we have a robustly-designed facility.
 9 It is a very capable facility, to use the term in a civil
 10 engineering perspective, or from the civil engineering
 11 perspective. Then looking at the facility through the
 12 evaluations that have been performed, both during the
 13 initial design, the licensing reviews done before initial
 14 licensing, and then on top of that, and really from my
 15 perspective, dwarfing the review is what we undertook
 16 during the Long-Term Seismic Program, which really did
 17 two things that pop out in my mind.

18 One, it characterized the inputs. In other
 19 words, what faults exist and what inputs could they
 20 provide to the power plant. And then as a part of that
 21 study, we looked again at the structures of the power
 22 plant, you know, in some cases, 10 to 15 years later,
 23 with better modeling and analytical techniques that were
 24 available at that time, and confirmed, in essence, what
 25 we knew when the plant was initially licensed. So that's

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1 where I'd really come from here, is the sense that the
 2 facility is robust.

3 As Goodum so correctly pointed out, this
 4 earthquake gave us the opportunity to confirm the design,
 5 our understanding of the design, and one of the important
 6 characteristics of that design, and that there has been
 7 no degradation that we can measure, insofar as that one
 8 data point would provide us.

9 MR. CLUFF: Let me add one little point, to
 10 amplify one of those, in terms of seismic safety. When
 11 we did the long-term seismic reevaluations, Larry said we
 12 had much more modern analytical tools. And what we
 13 discovered was that there was a lot more conservatism in
 14 the design than originally thought. It's inherent nature
 15 of good structural and civil engineers to, every time
 16 they have a chance, they add conservatism. So in the
 17 team we put together to do this, they found that there
 18 were conservatisms that weren't known, so the safety
 19 factors were much higher in a lot of the structures, not
 20 all of them, but in a lot of the structures, than what
 21 was originally thought.

22 MR. SHUKLA: You mean the margin?
 23 MR. CLUFF: Yes, the margin, yes.

24 MR. SHUKLA: So tomorrow, if we discover a new
 25 earthquake, bigger and better, as NRC regulation

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1 requires, you need to factor in that information into
 2 that Long-Term Seismic Program, and you will take
 3 appropriate action?

4 MR. CLUFF: Yes.

5 MR. SATORIUS: I have a question, and I am
 6 going to have to provide a little bit of context, so you
 7 know where I am coming from, so you'll know how to
 8 respond.

9 And that is, I understand in your Long-Term
 10 Seismic Program that you've developed a model, and that
 11 model predicts how the plant would respond to various
 12 seismic events, depending on where they would originate.
 13 And that is a model that's in place and it's part of our
 14 NRC requirements, and it's that you evaluate it after you
 15 have every seismic event.

16 How many times have you had to change that
 17 model? How many times have you had to go back and make
 18 changes to it, either to make it more conservative or
 19 less conservative? Could you give me a perspective on
 20 that?

21 MR. CLUFF: Larry, do you want me to take the
 22 first crack at that?

23 I understand what you are asking. And really,
 24 what we do when we go through evaluation, we would
 25 discover that from a margin perspective, either the model

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1 shows that we have less or more margin than we thought
 2 before.
 3 MR. SATORIUS: Right.
 4 MR. CLUFF: And in this case, I would say it's
 5 not a very good test because it's a puny, little
 6 earthquake, just to be frank. It's a long way away.
 7 What this shows is that we are very conservative. And we
 8 would have predicted, if this were the true nature of
 9 bigger earthquakes closer by, that that rule held, it
 10 would show that we've maybe got 30, 40 percent more
 11 margin than we would have thought. Now, I wouldn't want
 12 to bank on that, because the next earthquake might be on
 13 the other side of that median value.
 14 MR. SATORIUS: Are you going to use the results
 15 of this earthquake as a basis to change your model?
 16 MR. CLUFF: No.
 17 MR. SATORIUS: Or are you going to keep your
 18 model like it is with the conservatism, or are you going
 19 to use that conservatism to change that model?
 20 MR. CLUFF: The model is the model. It's
 21 tested by earthquakes, and then we see what significance
 22 that has. To change the actual physical aspects would
 23 mean doing structural changes to the facilities, and we
 24 see no need to even consider that now.
 25 MR. SATORIUS: Okay. That answers my question.

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1 Thank you.
 2 MR. PROULX: You have to help me out a bit in
 3 understanding what you mean by your model was consistent
 4 with what you predicted. Earlier in the week, I was led
 5 to understand that the amount of acceleration you had at
 6 the top of the containment dome was somewhat higher than
 7 it had been predicted. Can you give me a perspective on
 8 that?
 9 MR. CLUFF: Yeah. I've got some thoughts to
 10 give, but Larry, why don't you start out.
 11 MR. WOMACK: Let me kick that off. And we'll
 12 provide data in our report, and follow up on this. But
 13 as I said earlier, we have the Unit 1 containment well,
 14 instrumented. We have a sensor at the base of the
 15 containment. We have a sensor at the top of the
 16 containment.
 17 As I mentioned earlier, the input motion that
 18 we registered at the top of the containment, its spectral
 19 content, bore out the model, the results of the model
 20 that would tell us the frequency at which the structure
 21 would vibrate or resonate. Now, in comparing the
 22 magnitude of the acceleration recorded at the top of the
 23 containment, it was approximately the same level that the
 24 model would have predicted. And for the sake of argument
 25 here, I don't remember the exact numbers, but it was very

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1 close.
 2 Now, to fully understand this -- and "very
 3 close" may not be comforting to some people here. To
 4 fully understand this, our model is really benchmarked or
 5 plugged in for a large earthquake. And there are certain
 6 assumptions made in developing the model, related to what
 7 is called structural damping. And this would be the
 8 degree to which the structure absorbs energy that's
 9 transmitted from the base as it moves up to the top.
 10 Now, our model, again, for looking at an
 11 earthquake with an input of roughly three-quarters of a
 12 g, assumes a level of structural damping that an
 13 experienced structural engineer or other expert party
 14 would say is appropriate.
 15 For the type of earthquake we had here, the San
 16 Simeon, with low ground motion, low vibratory motion, the
 17 degree of damping by the structure, anecdotally and
 18 experientially, is much less. Yet, when we evaluated the
 19 data, we used the model with the higher damping.
 20 So kind of where I am headed here, David, is
 21 that we will be refining our model to look at a lower
 22 damping level. The level of amplification that we saw in
 23 this earthquake is completely consistent with our model,
 24 but since that model was at -- and I'll throw out a
 25 couple of numbers -- is a 7 percent damping, versus what

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1 would -- might be appropriate for this earthquake at 2
 2 percent damping, because it was such a much smaller
 3 earthquake, our model isn't going to be exact in this
 4 regard.
 5 So if that answer made any sense.
 6 MR. OATLEY: I would like to add a little bit
 7 to that, if I can. I think when you were informed of
 8 that, David, we had some early data from -- we had both
 9 an analog recorder and a digital recorder at these
 10 locations. And on the analog recorder on the tape, there
 11 was -- it looks like some larger accelerations than we
 12 would have predicted, but those also did not match the
 13 data we had on the digital recorder. And further
 14 analysis, and with confirmation by the vendor, that was
 15 noise from the aging of the tape on the analog portion.
 16 When you compare the digital to the non-noise spectrum
 17 from the analog, they match perfectly. And that, of
 18 course, coincides with what we were predicting for the
 19 top of the containment.
 20 Do you want to add anything?
 21 MR. CLUFF: No. That's fine.
 22 MR. OATLEY: Next is Jim Becker. And I think
 23 some of the statements that Jim is going to make is going
 24 to augment the statement of safety. Jim is going to talk
 25 about the actual chronology of events that happened at

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1 Diablo, and what we've learned from that, as far as our
 2 response from our original perspective.
 3 MR. BECKER: Thank you, Dave.
 4 So as Dave said, the two things I'm going to
 5 talk about are the chronology of events, basically what
 6 we did that day at the plant when the earthquake
 7 occurred, and then about what we are doing to improve
 8 further for the future, because part of running very well
 9 and being safe and reliable is taking every opportunity
 10 to learn when things happen, so those are the two things
 11 I'm going to talk about.
 12 First, the chronology. This slide shows the
 13 beginning of the chronology. On the day of the
 14 earthquake, December 22nd, both units at Diablo Canyon
 15 were at full power. At 11:16, the earthquake that we've
 16 been discussing, and Lloyd covered in detail, occurred.
 17 And when that happened, it was felt in the control room,
 18 instruments in the control room alarmed to further warn
 19 the operators that an earthquake was occurring. And so
 20 the operators implemented Procedure M-4. That's our
 21 earthquake procedure. It's a procedure that we've had
 22 for years that directs our staff on actions to take,
 23 should an earthquake occur at the plant.
 24 And the procedure is laid out with varying
 25 degrees of actions to be taken, based on the magnitude of

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1 the earthquake. So when the earthquake occurred, the
 2 operating staff got that procedure out and they started
 3 following it. And a lot of other things I'll talk about
 4 here that happened that day were directed by that
 5 procedure.
 6 When the earthquake happened, a number of
 7 alarms were received in the control room, like I said. I
 8 am going to go into some more detail on the
 9 bulk of the alarms in a few minutes. But probably the
 10 most significant alarm that operators received was on
 11 Unit 2. We received an alarm warning them that the
 12 running electrohydraulic pump had shut down. Now, these
 13 are nonsafety-related pumps, and their purpose is to
 14 develop hydraulic pressure for the system that controls
 15 the control valves for our main turbine on Unit 2. When
 16 the operators received the alarm, they verified the
 17 alarm. They checked the system conditions. They
 18 observed that the system hydraulic pressure was lowering,
 19 which is consistent with having a pump shut down, so
 20 based on those indications, they reset the trip signal on
 21 the pump and they restarted the pump. That was the
 22 appropriate action to take. And as a result of that,
 23 Unit 2 continued to run smoothly through the event.
 24 I'll also point out that the trip signal
 25 happened as a result of the shaking causing a relay to

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1 pick up spuriously and shut the pump down. It was
 2 basically a false low-level signal that caused the pump
 3 to shut down.
 4 MR. GWYNN: I would like to go back very
 5 briefly to your statement that you implemented Procedure
 6 M-4 Earthquake.
 7 MR. BECKER: Right.
 8 MR. GWYNN: Other than in training exercises,
 9 have you ever implemented that procedure before at Diablo
 10 Canyon?
 11 MR. BECKER: Yes. That's a good question.
 12 Yes, in fact, we have. That procedure is taken out any
 13 time we have an earthquake that we detect on-site. And
 14 so we have had, in the past operation of the plant, other
 15 earthquakes, smaller, in terms of ground acceleration,
 16 than this one, but we have had other earthquakes where
 17 the procedure has been used. And in fact, just six weeks
 18 or so prior to this, in October, we had a smaller
 19 earthquake, and that procedure was used in response to
 20 that earthquake as well.
 21 MR. GWYNN: Thank you.
 22 MR. BECKER: So that concludes my discussion
 23 about what the operators did with respect to the EH, or
 24 electrohydraulic pump.
 25 And then, per procedure, teams are dispatched

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1 through the plant to do walkdowns. And those teams
 2 consisted of people from Operations, Engineering and our
 3 safety organization. And I'll get back to the results of
 4 those walkdowns in a minute.
 5 Okay. So this is the second of the two slides
 6 talking about the chronology. So moving on.
 7 There is an instrument in the control room
 8 called an Earthquake Force Monitor. And that's a monitor
 9 that reads a maximum upscale deflection, if an earthquake
 10 were to occur. So what that means is if there is ground
 11 motion, if there is acceleration, that recorder is going
 12 to record the peak acceleration that was detected
 13 on-site.
 14 In this case, the reading that was observed was
 15 0.04 g's, as I think that has been referred to earlier.
 16 I would also point out, and I would compare that 0.04 g's
 17 to the value of our seismic reactor trip-set point. I
 18 think Larry mentioned in his opening comments, that is
 19 set at 0.3 g's, so we are talking roughly 15 percent or
 20 so, if that set point was the peak acceleration felt
 21 on-site during the earthquake.
 22 That reading is significant in a few ways. One
 23 is that it puts the earthquake in a certain category. As
 24 I mentioned earlier, the procedure has varying levels of
 25 actions, based on the severity of the earthquake, so that

1 directs the operators to a certain section of the
2 procedure. It also triggers us to declare what we call a
3 "Notification of Unusual Event." For that magnitude of
4 ground acceleration, that's what we would declare, an
5 NUE, or Notification of Unusual Event, as you know, is
6 the lowest of the four levels of emergency declaration at
7 the plant.

8 So following the procedure and reading the
9 Earthquake Force Monitor, the control room staff at 11:22
10 declared a Notice of Unusual Event, per procedure.

11 Within 12 minutes, we had notified the State and County
12 of the Notification of Unusual Event. In the next 24
13 hours, I believe, we made five follow-up notifications to
14 the State and County to let them know what we were doing
15 with the plant, what the situation was at Diablo Canyon.

16 We also dispatched -- although it is not
17 required for an NUE -- we also dispatched some of our
18 personnel to the emergency operations facility in
19 San Luis Obispo to assist the County, both in responding
20 to the event countywide, and also in answering questions
21 about what was going on at Diablo Canyon, so that action
22 was also taken.

23 I mentioned it was about a 24-hour period where
24 we were making updates. The reason we held the
25 Notification of Unusual Event status open for that long,

1 members of our engineering staff. And those are system
2 walkdowns in selected areas of the plant. And they are
3 looking for damage to plant systems, structural damage,
4 leaks, you know, anything like that. So those walkdowns
5 were also started in that same time frame.

6 And then in the control room, there is a series
7 of walkdowns done by our control room operators. They
8 scan our instruments and actually record the values of
9 the instruments in the control room, and then come back a
10 period of time later and repeat that scan, and repeat
11 recording those values. The reason you do that is to
12 look for a change; a change in a level, a change in a
13 pressure could be an indication that there is a problem
14 developing with that system, so that's why we do that,
15 post-earthquake.

16 All those were done that day. And we are
17 talking about a six-hour time frame, from the time of the
18 earthquake until all those types of walkdowns were
19 completed.

20 And then finally, as part of our
21 lessons-learned effort, that I'll get into in a second,
22 we also ask our engineering staff to do site walkdowns in
23 the days following the earthquake. These are not so much
24 in the power plant, as in the other structures, the
25 administration building, other structures on-site, and

1 for 24 hours, was twofold. We, after talking with our
2 geosciences personnel post-earthquake, we learned that
3 the greatest likelihood of a significant aftershock
4 exists in the first 24 hours after the main quake, so we
5 felt it would be prudent to wait for that time period to
6 pass, before we decided to terminate the Notification of
7 Unusual Event.

8 Additionally, we wanted to take the time to use
9 our seismic instrument, de-log the instrumentation, so we
10 downloaded all the data off of it, and also reset the
11 instrumentation so that if another earthquake were to
12 occur, we would accurately measure the level and
13 implement the emergency plan at the proper stage. So for
14 those two reasons, we did delay for about 24 hours; it
15 was the next day before we terminated from the NUE.

16 And so now to get back to the control room and
17 the plant walkdowns. I mentioned they were dispatched
18 per the procedure, earlier. There actually are several
19 phases of walkdowns that occur. The operators and safety
20 personnel are dispatched by procedure to basically pretty
21 much the entire plant to look for any signs of a fire or
22 damage to our fire protection or fire detection
23 equipment. So those walkdowns occurred in a period of
24 several hours after the earthquake.

25 There are also plant walkdowns performed by

1 also to walk the grounds, looking for any signs of soil
2 movement, things like that. So those occurred in the
3 days following the quake.

4 To summarize the walkdowns, all walkdowns were
5 completed, and they were completed satisfactorily. There
6 were no indications of damage as a result of the
7 walkdowns.

8 Now, I'll get into the lessons-learned part.

9 MR. GWYNN: Excuse me. Before you go forward,
10 I would just like to make a comment, from my own
11 perspective.

12 Of course you know that almost immediately
13 following the feeling of the ground motion at the plant,
14 our on-site inspectors responded to our control room and
15 established communication with our response centers, both
16 in headquarters and in Arlington, Texas. And so we had
17 very quick information and feedback from our on-site
18 safety inspectors. And of course, David is going to
19 brief the community on those actions later in the
20 evening.

21 But very shortly after we got our initial
22 reports from the on-site inspectors, we saw that the
23 national news media started to pick up what was
24 mischaracterization of the situation at Diablo Canyon.
25 And so when I saw that your emergency response

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1 organization promptly corrected that information and got
 2 the facts out to the community, I thought that that was a
 3 very responsible action on the part of Pacific Gas &
 4 Electric Company. Of course, if we had a question about
 5 the validity and veracity of that information, we would
 6 have made our own statement to the media.
 7 So I just wanted to mention that I thought that
 8 that was exactly the right thing to do at that time.
 9 MR. BECKER: Thank you.
 10 So Larry, we'll move on to our lessons learned.
 11 Before I get into the lessons learned, some perspective
 12 on it. In looking back on what we did that day, we feel
 13 that we handled the event -- overall, our handling of the
 14 event was a success. And the reasons that I say that are
 15 we properly implemented our procedure; we used it to
 16 classify the event properly, per our emergency plan; we
 17 completed our walkdowns; the plant operated well through
 18 the event; all our safety systems worked as designed, and
 19 finally, we had no personnel injuries on-site. So we do
 20 look at our handling of the event as a success. But like
 21 I said earlier, the way you get better is by always
 22 taking an opportunity to learn, going forward. So this
 23 is what this represents. Our lessons-learned effort is
 24 an effort to learn from this event.
 25 So we put together what we call an Event

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1 Response Team. This is a mechanism that we've used over
 2 the years at Diablo Canyon. When something has happened,
 3 we put together a multidiscipline team. In this case, we
 4 had members of Operations, our training organization,
 5 Engineering, Maintenance. It's headed up by myself. And
 6 we get together, and we look at what happened. We look
 7 at what our responses were. We look at how our
 8 procedures worked, et cetera. And we look for
 9 opportunities to improve from that. And I'll go into
 10 some detail now as to where we've been looking at what
 11 sort of actions were taken.
 12 So we divided our efforts up into several
 13 areas. And the next two slides show the areas that we
 14 focused our efforts on in the Event Response Team, so
 15 I'll briefly step through them.
 16 In the area of personnel safety, like I said,
 17 we are very glad that we had no injuries on-site when the
 18 earthquake happened. Looking back on it, we have decided
 19 and have completed some personnel safety training for our
 20 own employees. And this consists of guidance. Next time
 21 that they experience an earthquake, whether they are at
 22 work or at home, what sort of commonsense actions can
 23 they take to protect themselves. When an earthquake
 24 hits, you don't have a lot of time to think about it, so
 25 if you've thought ahead of time about the actions you

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1 would take in an earthquake, there is a high likelihood
 2 that you are going to do it and you're going to help
 3 protect yourself. So we've done that.
 4 And the other thing that fits into this
 5 category is the engineering walkdowns, the site
 6 walkdowns, those follow-up walkdowns I talked about,
 7 those were aimed at verifying the safety of our site
 8 structures and the site overall, and that action is now
 9 complete.
 10 In the procedure revision area, this is about
 11 our Procedure M-4 that I referred to earlier, a few
 12 things we're doing there. We are reformatting a bit to
 13 improve the human factors, make it easier to follow.
 14 This is based on comments of the individuals that were
 15 using it that day. And the folks that implemented the
 16 procedure on the day of the earthquake, they also used
 17 their judgment to take some additional steps, to do some
 18 additional checks and things like that, that actually
 19 would not have been required by the Procedure until we
 20 had a larger earthquake. But in their judgment, that was
 21 the right thing to do. And looking back on it, we concur
 22 with that. So we are going to change the procedure to
 23 require those sorts of actions that were taken in good
 24 judgment, but we're going to require them in the future
 25 for this type of an earthquake. So those are some of the

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1 changes we are making in the procedure.
 2 In the emergency plan implementation area,
 3 there are two things I would talk about. First of all, I
 4 talk about the logic and the reasoning that went into
 5 maintaining the NUE status for 24 hours. Looking back on
 6 it, we think that was appropriate, so we are changing our
 7 M-4 procedure to have those requirements for the next
 8 time there is an earthquake. We will follow that same
 9 logic about giving -- you know, giving time for
 10 aftershocks and resetting our instrumentation, before we
 11 terminate from the NUE.
 12 I would also point out that we are aware that
 13 there were 50-some sirens in the county, that went out of
 14 service during the earthquake due to the loss of power
 15 that occurred in the county. And we have been informed,
 16 we have verified that the County has a standard operating
 17 procedure, in the event that the sirens are lost at any
 18 time, for backup mechanisms to alert the public to tune
 19 in their radios to the broadcast. And basically, that
 20 would be using emergency personnel, fire and police, to
 21 do that.
 22 In the training area, I mentioned the personnel
 23 safety training we did. We are also planning to train
 24 our operations staff on lessons learned from this event,
 25 the changes we are going to be making to the M-4

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1 procedure. And we will also run our simulator to bring
 2 in some of these sorts of alarms and indications the
 3 operators saw that day, so that what they experienced and
 4 saw that day, other crews get a chance to see that on the
 5 simulator and practice it, so we will be doing that in
 6 training.
 7 A couple of things in plant system response.
 8 In the operations area, what I'd point out is the EH pump
 9 trip that I talked about earlier, we will be changing the
 10 design for that trip. We don't want that to happen. We
 11 don't want that to challenge the operators, if there is a
 12 earthquake in the future. Like I said, that was a
 13 spurious trip. So we'll be changing the control system
 14 for those pumps, to prevent that from happening in the
 15 future.
 16 Also in the plant systems response area, our
 17 engineering folks have looked at our plant systems and
 18 how they responded during the earthquake. I mentioned
 19 the alarms that were received in the control room. Some
 20 of these alarms were brought in by what we call mercoid
 21 switches. These are on the secondary or
 22 nonsafety-related part of the plant, but they are a
 23 switch that has mercury in them. And in the shaking of
 24 the earthquake, it caused the switch to change state
 25 repeatedly. This brought in alarms. There were on the

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1 nonsafety side of the plant. But nevertheless, the
 2 alarms are a challenge for the operators, from a
 3 standpoint of handling that information. So we're going
 4 to be going through and modifying some of these switches
 5 so that if we have another earthquake, the operators
 6 won't be challenged with the spurious alarms that they
 7 had to deal with this time.
 8 MR. GWYNN: Can you give me a sense for the
 9 schedule that you have to complete that work? Because I
 10 agree with you that having that sort of a distraction for
 11 the operators is not a desirable situation in this
 12 circumstance?
 13 MR. BECKER: Right now, the first thing we need
 14 to do is evaluate the switches that we want to change
 15 out. And we want to have that evaluation done by the end
 16 of this month. From there, we are going to have to look
 17 at what switches they are. Some of the switches, I am
 18 sure, would require an outage to go in and do. So I am
 19 sure we will be doing those in the next available
 20 refueling outage.
 21 Other switches, I'm imagining could be done
 22 on-line. So it's going to depend on the location of the
 23 switch and the nature of the switch with the schedule.
 24 Our first step is to do the evaluation, and that's what
 25 we're going to be focusing on.

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1 One other thing I would add, in the plant
 2 systems response, we have what's called a relay chatter
 3 analysis that was already existing at the plant. And it
 4 looked at, if we had shaking like this, what relays or
 5 other devices would change state, sort of erratically,
 6 because of the shaking. And we compared what we saw in
 7 the control room and in the plant that day to this
 8 chatter analysis, and the results were consistent.
 9 Chatter analysis looked at safety-related and
 10 shutdown-related systems, and we saw no problems with
 11 those systems, as reflected in the chatter analysis. The
 12 issues I've been talking about were in a
 13 nonsafety-related part of the plant.
 14 And finally --
 15 MR. JONES: One question for you. To kind of
 16 clarify some previous history at Diablo Canyon, and I'm
 17 trying to use the opportunity to evaluate the information
 18 you received from the San Simeon earthquake,
 19 understanding up front that the horizontal and vertical
 20 accelerations of the ground that were seen was
 21 significantly less than what the facility is designed
 22 for.
 23 Going back to 1981, I think it was referred to
 24 as the mirror-image issue at Diablo Canyon, which in
 25 essence dealt with some seismic supports for a

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1 containment spray and also -- I think it was the main
 2 feed water system associated with Unit 1. And as a
 3 result of that, you initiated an independent design
 4 verification program.
 5 What I would like to understand is in your
 6 review and evaluation of the data so far, have you seen
 7 that the Unit 1 and Unit 2 containments, given the
 8 response to the San Simeon earthquake, were as you
 9 expected in both cases? Were they similar? Have you
 10 seen any differences? Any differences in the
 11 accelerometer readings between those two?
 12 MR. WOMACK: It's been completely consistent.
 13 And in all candor, I've got to point out that we have, as
 14 I said earlier, a sensor at the base of the Unit 1
 15 containment, a sensor at the top of the Unit 1
 16 containment. The response of the sensor at the top of
 17 the containment was completely consistent with the
 18 analysis models and licensing basis. So really, on that
 19 basis, I conclude that the unit containment performed
 20 similarly.
 21 So I think, in short, they were completely
 22 consistent with what we determined originally and through
 23 both the design verification, independent design
 24 verification program, and most importantly, the Long-Term
 25 Seismic Program, because that program did go back and

1 look at those structures for their capability.
2 MR. JONES: So you saw no differences in any
3 seismic supports that had actually moved, or any hangers
4 between Unit 1 and Unit 2 containment walk-throughs?

5 MR. WOMACK: In the course of the walkdowns,
6 and Jim could add to this as well, we've seen nothing
7 that is surprising to us. It's totally consistent with
8 what we would expect in response to this type of shaking.

9 MR. JONES: Thank you.

10 MR. BECKER: So to wrap up our lessons-learned
11 effort, in the plant response area, Civil Engineering and
12 Geosciences have taken some actions. I talked about some
13 of the walkdowns that have already occurred. We are
14 going to be adding to that walkdown guidance so that in a
15 future earthquake, we can use that as part of our
16 walkdown strategy in the plant.

17 And we also tasked our representatives from
18 Geosciences on the team, basically verifying what Lloyd
19 had talked about earlier, with verifying that the site
20 structural response was within what would be predicted by
21 our models for an earthquake of this magnitude and
22 location. And as Lloyd went through in some detail, the
23 answer was yes, it was consistent with those predictions.

24 Finally, in the security area, we did security
25 walkdowns after the earthquake. We did not have problems

1 and operate as designed.

2 And finally, Jim Becker talked about
3 incorporating other lessons learned to train our
4 operators, in the event that we have another earthquake
5 like this, so that we are better prepared. And that
6 really concludes our presentation to you this evening.

7 MR. SHUKLA: Mr. Oatley, I have a question.
8 When you say that there was no damage observed, do you
9 have any reason to suspect there could be some hidden
10 damage or subsurface damage that you could imagine?

11 MR. OATLEY: I'll answer that two ways. One,
12 this earthquake was very small, compared to our design.
13 So given that, it would be surprising to have something
14 like that. Second, we did walkdowns of all the visible
15 areas of the plant and found nothing, and the testing of
16 our equipment found nothing. So I can't imagine that
17 there would be something like that that occurred.

18 Now, as part of our license, we have in-service
19 testing we must do. We have to do various radiographs at
20 times, various other testing going forward, as part of
21 our routine operation of the plant. And if there was
22 anything like that, our regular inspection program would
23 detect it going forward. And of course, we would have to
24 notify you at the time.

25 MR. SHUKLA: Thank you.

1 with our security equipment that affected our security
2 plan; however, we will be adding to our plans to define
3 security system walkdowns so the next time there is an
4 earthquake, we'll have a preplan for doing it, and that's
5 the action we're taking there.

6 So that completes my overall chronology of the
7 event and what we're doing in the lessons-learned area.

8 MR. OATLEY: I'd like to wrap this up. It's
9 been a long presentation, but I'll conclude with
10 basically what Greg opened with. The Diablo Canyon Power
11 Plant has a very robust earthquake design. The
12 San Simeon earthquake characteristics were very typical
13 for this area, and anticipated in the tectonic models
14 used in the design for Diablo Canyon.

15 The ground response at Diablo Canyon was less
16 than what we predicted for this type of earthquake. And
17 I believe Lloyd called it "puny," relative to our design.

18 Diablo Canyon structures performed as expected.
19 There was no surprises there in our analysis. And PG&E's
20 response, subsequent to the earthquake, was very
21 thorough. We know there was no damage, because we have
22 looked. We did the physical walkdown detailed of all our
23 buildings, all our structures and components, and there
24 was no damage to the facility. We also tested our
25 safety-related equipment to verify that it would start

1 MR. SATORIUS: Were there any other questions
2 from the staff?

3 We typically poll our staff to see if there is
4 a need for us to meet outside of the meeting to see if
5 there are other issues we need to discuss. I am looking
6 at the staff to see if -- there appears that we've gotten
7 the answers to our questions that we've asked.

8 Pat, did you have any concluding comments that
9 you would like to make, prior to moving on to the next
10 portion of the meeting?

11 MR. GWYNN: I would like to thank Pacific Gas &
12 Electric Company for taking the time to meet with us this
13 evening. I think it was important for us to hear this
14 report.

15 We still have ongoing reviews. Of course, we
16 need to get our supplemental report, for us to continue
17 our review, and we are looking forward to the additional
18 report, once USGS and Pacific Gas & Electric come into
19 alignment on the analysis of the earthquake results. So
20 we do appreciate your meeting with us this evening and
21 sharing this information with us and with the local
22 community.

23 MR. OATLEY: Thank you.

24 MR. SATORIUS: And I guess lastly, if we could
25 get a copy of your presentation, such that it could be

1 combined with the meeting summary and be available for
2 the public; we would appreciate that.

3 MR. OATLEY: We will make it happen.

4 MR. SATORIUS: Thank you.

5 The next part of this meeting, which will
6 remain open -- we have completed our business with
7 Pacific Gas & Electric -- is to open up the floor for
8 comments from members of the community.

9 What we would like to do is Victor Dricks, our
10 public affairs officer, will kind of take a role and, I
11 guess, moderating the questions. We would like to ask
12 everyone to limit their questions to five minutes. And
13 also, be aware that after -- immediately following this
14 meeting, there will be a meeting solely between the NRC
15 and members of the public for us to brief the members of
16 the community on our inspection activities, and then to
17 take questions on our inspection activities and other
18 issues that the members of the community may have.

19 So we will take questions from the community
20 now on this particular aspect of the meeting that we
21 performed with Pacific Gas & Electric.

22 And Victor, would you just --

23 MR. DRICKS: Yeah. I'm Victor Dricks. I'm the
24 public affairs officer in Region IV. What we would like
25 to do is we've set aside plenty of time this evening for

1 MR. WEISMAN: Where were we? Oh, yes.

2 -- glib and facile answer to the reason that
3 nearly half the sirens in the county were without power.
4 What it seemed was that was just passed off as the county
5 has a standard operating procedure, and the county has to
6 deal with the backups needed for that. And I am reminded
7 that the only reason this county has sirens is because
8 Diablo Canyon is here. So it would seem to me that sort
9 of throwing the responsibility onto the county doesn't
10 actually answer the question, which is, one, why was
11 there a loss of power, why is there no backup power
12 provided to these sirens? Two, to the NRC here, didn't
13 you experience a loss of power and siren thing at the
14 big, blackout thing of the east coast last summer?
15 Shouldn't things have gone into effect immediately,
16 issued, saying "Wow, when power is cut, there could be an
17 emergency. We need to have backup in place."

18 Radios and television, that would be great,
19 except for people in A.G., and Grover Beach, and all who
20 didn't have power or television to turn them on. I
21 suppose you could go down and get in your car in the
22 garage, hoping to keep the door open when you turn it on,
23 and listen to the radio at that time.

24 But what we didn't hear is why did the power
25 fail to these? Why is there no backup system? You know,

1 anyone who wants to speak and ask questions. What we
2 would like to do at this portion of the first meeting is
3 ask you to restrict whatever comments or questions you
4 have to the technical presentation that you just heard.
5 And then when that's finished, we will take a brief
6 intermission, five or ten minutes, and then have a second
7 meeting, which is specially designed to allow you all to
8 ask what questions you have on a variety of different
9 topics.

10 So, anyone have a question?

11 Come up to the podium. Please identify
12 yourself, if you would.

13 You are a familiar face.

14 MR. WEISMAN: Thank you. My mother says that
15 often too. In limiting the question to the matter at
16 hand, it would have to do, I guess, with the somewhat --
17 seemed to me, a pretty glib and facile answer to the
18 failure of nearly half the sirens in this --

19 MR. GWYNN: I'm sorry. Could you identify
20 yourself?

21 MR. WEISMAN: You're right. I'm such a
22 familiar face. I thought that spoke for itself.

23 MR. GWYNN: The court reporter didn't hear you.

24 MR. WEISMAN: David Weisman, Morro Bay.

25 MR. GWYNN: Thank you, David.

1 I've driven by. I've seen those sirens on the side of
2 the road. You've got a pole, you've got a siren. About
3 10 feet up, there is a big shelf with a big box on it.
4 All these years here, I've always thought that's where
5 the backup battery and the radio transponder are getting
6 a signal, in the event the land lines go down, was. But
7 see, I'm not an engineer, so I don't know what's in the
8 boxes on the siren tower. So given that, I'll limit this
9 just to the questions involving this; that would be the
10 first question.

11 And the second was, if it was prudent to hold
12 the Notice of Unusual Event open for 24 hours because
13 there could be a substantial aftershock, and I don't
14 think it is unusual. It has occurred that there has been
15 an aftershock that ends up being more powerful than the
16 initial shock. It has happened in places in the world,
17 not necessarily here. If it was prudent to hold it open
18 for 24 hours, why not get a -- ramp down the power as a
19 precaution, make sure that battery backup generators were
20 there to keep cooling water flowing and so forth, because
21 the public didn't get that impression at all.

22 I'm also curious, please, if you could clarify
23 when the statement was made that the national media had
24 suddenly picked up some misinformation. I don't know. I
25 started taping KSBY about 15 minutes after the event

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1 occurred, once I was able to get past all the broken
 2 glass in my kitchen. And I didn't hear any national
 3 misinformation. So if you have an indication as to what
 4 that national story was and the text of it, I would be
 5 quite interested in hearing.
 6 Thank you. That will be the limit for this.
 7 MR. GWYNN: With respect to the alert and
 8 notification system that's required by our regulations
 9 for this facility, that process is administered through
 10 the Federal Emergency Management Agency and San Luis
 11 Obispo County, and so I think that's why you heard the
 12 type of an answer that you did. I personally am not
 13 intimately familiar with all of the provisions of the
 14 County's emergency plan for Diablo Canyon. But I know
 15 that in general, those Federal regulations that relate to
 16 alert notification systems provide for backup systems
 17 that do alert and notify the public. And I am just not
 18 familiar with the specifics of this emergency plan.
 19 Perhaps Pacific Gas & Electric could give us some
 20 Particulars.
 21 MR. OATLEY: I'll start answering, and if Jim
 22 Becker has anything to add, please chime in here.
 23 I would like to address this in two parts.
 24 First, there was a question on why the loss of power.
 25 Clearly, the earthquake caused a lot of damage to our

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1 distribution systems which deliver power to this
 2 neighborhood, which took about 24 hours to restore it
 3 fully to service, although most of the sirens were
 4 restored much, much faster than that.
 5 The box on the side of the pole, that was
 6 referred to, is for the radio transmission system, for
 7 the signals to get to the sirens. The sirens are powered
 8 by the power pole they sit on. While there is no
 9 requirement for backup to the sirens, we have thought
 10 about that, and the County has thought about that, in the
 11 context of what Jim Becker has mentioned, in that it is
 12 always possible you could lose siren power.
 13 Our new system we installed a few years ago now
 14 provided immediate information to the County's watch
 15 commander on whether there has been a loss of a siren in
 16 the county, and whether it's due to power loss. So we
 17 know what sirens have been lost, we know where they're
 18 at, and that information is available to the local
 19 emergency authorities, to dispatch police or fire to use
 20 their public address systems and notify the County.
 21 Now, many of the larger centers with people in
 22 it, such as hospitals and the like, have another way of
 23 gaining information. That's called a tone alert radio
 24 system that we've provided them, that's automatically
 25 activated upon the emergency broadcast system being

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1 activated, and tells them what's going on. They don't
 2 need the siren nor a separate radio to get information
 3 there. So that's really the siren power and how that
 4 works.
 5 Now, this has been evaluated by the Federal
 6 Emergency Management Agency, the tactics and strategies,
 7 and we in the County of San Luis Obispo use -- are
 8 consistent with what's used elsewhere in the United
 9 States, not only for nuclear power plant emergencies, but
 10 emergencies of other natural disasters.
 11 Communication by use of public address system,
 12 with the sheriff's department or other emergency
 13 vehicles, is a very viable way of communicating with the
 14 public in areas where there are no sirens and where
 15 natural disasters do occur.
 16 MR. DRICKS: You had also, if I understood,
 17 asked a question --
 18 MR. WEISMAN: Why the power, if it was held as
 19 an unusual occurrence --
 20 MR. GWYNN: That was your third question. I
 21 think your second question related to misinformation.
 22 And that was a personal observation that I made in our
 23 Incident Response Center. In our Arlington, Texas,
 24 offices we continuously monitor several national news
 25 media -- CNN, Fox News, others. Typically, they run

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1 tickers at the bottom of their screen, with text. And it
 2 was a ticker that came across one time. And to be honest
 3 with you, I can't recall the exact report that was being
 4 made. I can only tell you that what I saw was
 5 inconsistent with what we were being told by our resident
 6 inspectors.
 7 MR. WEISMAN: Then we can use that when we look
 8 at the national media and we hear other stories, to kind
 9 of judge what we think of the tickers on the bottom of
 10 Fox and CNN.
 11 MR. DRICKS: If I recall, I think it said the
 12 plant had shut down. And that was not the case, which
 13 brings me to the third question you asked, which is why
 14 didn't the plant shut down. And if I understand
 15 correctly from the presentation from the folks of PG&E,
 16 and also from our own technical staff, the size of the
 17 earthquake was such that it wasn't necessary for the
 18 plant to shut down. It was such a small fraction of what
 19 the plant is able to operate through, that there was no
 20 reason for the plant to shut down. And in the event of a
 21 real emergency, power might be needed from the plant for
 22 emergency functions.
 23 MR. OATLEY: If I could add two statements to
 24 that. That's very accurate. I would like to add that we
 25 were in constant communication with Lloyd Cluff and his

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1 staff regarding the aftershocks that were seen and what
 2 did they mean, and that factored into our decision. And
 3 we also had, as mentioned earlier, an automatic rapid
 4 trip-set point well below the design criteria for Diablo
 5 Canyon, so in the unlikely event that we were wrong, the
 6 reactor would automatically shut down, before exceeding
 7 any of our design limits.

8 MR. GOTHROP: My name is Bill Gothrup. I was a
 9 seismologist for the USGS for a number of years. I also
 10 teach seismology here at the local university, Cal Poly.

11 I've dealt a lot with Lloyd in the past, and
 12 we've agreed on a lot of things, and I agreed very much
 13 with what he said about this particular earthquake; that
 14 it's far enough away, small enough that we would expect
 15 to have accelerations fairly low from this particular
 16 earthquake, at the power plant.

17 Some of the areas where I disagree with Lloyd
 18 relate somewhat with the mechanism of the earthquakes
 19 that occur right near the Hosgri Fault. I've done a lot
 20 of work with looking at some of the older earthquakes
 21 along the Hosgri Fault, and found significant thrust
 22 components along there. I know a number of the
 23 earthquakes you've seen recently have been more strike
 24 slip, but I do know that there is actually -- can't say
 25 the earthquakes are on the Hosgri Fault. We couldn't say

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1 that unless they actually broke through the surface, but
 2 they are right in the vicinity where the Hosgri Fault is.

3 A second place where I tend to question some of
 4 this stuff is when we look at a very, very near field,
 5 what the accelerations are when we get very close to the
 6 fault rupture itself, data that is right next to the
 7 fault rupture is extremely scarce. We know that there
 8 is, for example, in the 1971 San Fernando earthquake, the
 9 accelerometer at the Pacoima dam measured 1 1/4 g's from
 10 an earthquake, which was 6.8, I believe it was, 6.9, on
 11 the Richter scale. That's one of the few data points we
 12 have very close to the earthquake.

13 And when he showed the plot that came up to
 14 clear zero distance, everything tends to curve over to
 15 where it seems like the accelerations get almost stable,
 16 when you get in close to the fault. I don't think that
 17 there is information that says that it actually should
 18 necessarily curve over. In fact, with the scarcity of
 19 data, if anything, being conservative would say you
 20 shouldn't really assume it would curve over.

21 If you have most of your measurements from
 22 fault ruptures which are very deep in the earth, you have
 23 that extra distance from the brittle part of the fault
 24 giving off the energy to the surface, even if the fault
 25 were right underneath where your accelerometer is.

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1 In the case of some of the thrust earthquakes,
 2 it's quite possible you have a fairly brittle zone right
 3 up near the surface. You can exceed much higher
 4 accelerations from a thrust earthquake, just because the
 5 brittle zone does get much closer to where you can get
 6 your accelerometers.

7 The other thing which I am a little concerned
 8 about is when they talk about how far offshore the Hosgri
 9 Fault is from the power plant. It's quite possible to
 10 map faults that are onshore. It's also possible to map
 11 faults which are well offshore, where you can bring your
 12 boat in and do a seismic line out. But the very
 13 near-shore region, what we call the transition zone,
 14 generally requires a completely different kind of survey
 15 to figure out whether you actually have faults right next
 16 to the shore.

17 The question I have is, Has a transition zone
 18 survey been done in the vicinity of Diablo Canyon to see
 19 if there are any faults that are right next to shore, but
 20 not actually onshore where a geologist has been able to
 21 map it?

22 MR. SATORIUS: If I could ask you a question on
 23 your second issue. And that is, if you look at the one
 24 chart -- I believe it was the log-log chart -- rather
 25 than it being a curved plot, you would suggest it might

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1 appear more linear, from looking at it?

2 MR. GOTHROP: Potentially. The amount of data
 3 you have in the very close-in region is so sparse that
 4 it's hard to say really what it is. And that's really
 5 the critical area where you could see the very high
 6 accelerations. And it's also where you could see the
 7 power plant being very, very close to a thrust fault or a
 8 thrust component of an earthquake fault out there.

9 MR. SATORIUS: I just wanted to make sure I
 10 understood what your position was. Thanks.

11 MR. CLUFF: Did you want us to say anything, or
 12 just keep quiet?

13 MR. GWYNN: Well, we do not have a staff
 14 seismologist with us tonight. Of course, we have a
 15 number of seismologists, both on staff and under contract
 16 to the agency. We sometimes utilize USGS as a
 17 consultant. I think you've raised some concerns that are
 18 worthy of discussion amongst our seismic staff. And for
 19 that reason, what I would like to do is take the record,
 20 go back to the office, have them look at what you've
 21 said. And then, perhaps we can provide a written
 22 response at a later date, if that's acceptable to you.

23 Pacific Gas & Electric, is there anything that
 24 you'd like to say at this time, with respect to the
 25 comments that we just heard?

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1 MR. CLUFF: Just a couple of quick ones,
 2 because Bill and I could talk for the next hour. And it
 3 would be very entertaining to us, but maybe not the
 4 audience.
 5 The Long-Term Seismic Program was aimed at
 6 answering the questions that Bill has raised. And I
 7 would ask him to go back and read that. I understand
 8 Bill has never read our report.
 9 MR. GOTHROP: Not true.
 10 MR. CLUFF: Well, that's what you told me the
 11 other -- last summer, that you hadn't read the whole
 12 report.
 13 But nevertheless, it doesn't mean that our
 14 opinions get changed. And Bill raises some important
 15 questions. I completely agree that they are important
 16 questions.
 17 But with regard to his question about the
 18 flattening of the attenuation curve, we've discovered, in
 19 the last several years, some very dramatic changes in
 20 helping us get insights into that, and it surprised us
 21 all. And that is that in many earthquakes, and big ones
 22 that I'm thinking of are the two big earthquakes in
 23 Turkey in 1999, where we had good recordings within a
 24 short distance from the source of the earthquakes. The
 25 near fault would cause that fault to go way down, because

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1 there was hardly any shaking near the fault. It had to
 2 get out a ways before that could come back up, in both of
 3 those earthquakes.
 4 In the Chi-Chi earthquake in Taiwan, a thrust
 5 earthquake, to address your other question, Ben Sign, who
 6 was a member of our staff, during the LTSP, is the chief
 7 seismologist in Taiwan. He installed 600 strong motion
 8 recorders within a year; he returned to Taiwan to take
 9 over that program, and then they had this big earthquake,
 10 a magnitude 7.6.
 11 The fault slipped 8 meters in one location. In
 12 one location, on the hanging wall, they did get some
 13 accelerations of -- approaching 1 g, in one place
 14 slightly more. But right next to the fault, on both the
 15 waning wall and particularly the foot wall of the fault,
 16 the ground motions were hardly detectable. There were
 17 buildings that were unreinforced masonry within a few
 18 tens of meters on the down-thrown part of the fault. I
 19 walked through those houses. The dishes in the cabinets
 20 were not even disturbed.
 21 So all of a sudden, we are seeing it depends.
 22 It depends on how the fault ruptures, what kind of
 23 buildings are there, what the site conditions are, and I
 24 have seen that. I have investigated about 50 destructive
 25 earthquakes in different parts of the world. And I keep

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1 coming back, telling the engineers that I see a lot of
 2 evidence for near-source effects, depending upon the
 3 frequency, that we are worried about, where the ground
 4 motions are not very strong.
 5 When you get out a ways, you get the travel
 6 path, basin effects, and site effects. You can get a lot
 7 more damage out at 10, 20, 50 kilometers than you do
 8 right next to the fault, so it's a very complex question.
 9 The Pacific Earthquake Engineering Research
 10 Center that's headquartered in Berkeley, that we are a
 11 partnership with, with the Energy Commission and
 12 Caltrans, are addressing this question and we have a
 13 program called "The New Generation Attenuation." And
 14 later this year, you will be seeing the first revisions
 15 of all these attenuations that are going to show all
 16 these variations. So I would invite you to keep up, and
 17 I will make sure that I send you a copy of some of this.
 18 There is a number of other things that I would
 19 like to get into, but I think that's enough for right
 20 now.
 21 MR. DRICKS: Next question.
 22 MR. MARKS: My name is Steven Marks. I live in
 23 San Luis Obispo. On December 22nd, I found myself
 24 enjoying the bumping and shimmying of the earthquake as I
 25 stood in my study doorway, but then immediately being

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1 quite frightened and anxious about what was happening at
 2 Diablo Canyon. I phoned the television station to see if
 3 I could just get some news about what was going on there.
 4 They said, yes, they had experienced the earthquake quite
 5 dramatically too, but they had no information from Diablo
 6 Canyon. They didn't know anything about what was going
 7 on out there. There was no other source of information.
 8 I phoned a radio station; got no information.
 9 About 15 minutes later, I again called the
 10 television station. At that point, they just had
 11 received some information that there was no damage there.
 12 I was quite relieved at that news. But that experience,
 13 together with the information I just got tonight about
 14 the sirens not working, makes me feel that there is some
 15 serious problems about communicating with the public, who
 16 are directly affected by this tremendously dangerous
 17 facility that we live near. And I think that there
 18 really should be some exploration about passing
 19 information out to the public. If there was a more
 20 serious earthquake, if it was an event where there was
 21 some damage, if the conditions of communication and
 22 reporting that were in place in this nonsignificant
 23 event, the lack of communication could have had
 24 disastrous effects. Thank you.
 25 MR. DRICKS: Let me respond to that, if I may.

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1 Let me suggest that I'll give you my card. You can
 2 always call our office, and we had information available
 3 within five minutes of our folks reporting to the control
 4 room, as you'll hear in a few minutes.
 5 I can't apologize for the media. I didn't get
 6 any calls maybe until 30 minutes or an hour after the
 7 first earthquake, and they were from local media in the
 8 Dallas/Forth Worth area. I believe the licensee issued a
 9 press release, and how quickly the news media in the area
 10 disseminated that, is something -- I understand your
 11 concern there.
 12 But certainly, in terms of getting information
 13 from the NRC, you certainly should feel free to give us a
 14 call, and we will share with you the information that we
 15 have. I apologize for your frustration.
 16 MS. GROOT: My name is Henrietta Groot here.
 17 I'm here on behalf of the local chapter of the Sierra
 18 Club. My first question is kind of a follow-up on the
 19 question that Mr. Jones asked. I felt that either I
 20 misunderstood his question or it wasn't adequately
 21 answered. I think Mr. Jones asked whether there was a
 22 similarity in the readings of Unit 2 and Unit 1. And I
 23 believe the answer was, "We didn't measure Unit 2. We
 24 just concluded it was okay, based on the measurements
 25 from Unit 2" -- "from Unit 1."

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1 Did I misunderstand your question or was
 2 that --
 3 MR. JONES: That dealt with the nature of the
 4 question, and it also dealt with some other information I
 5 had from my on-site safety inspectors, David Proulx and
 6 Terry Jackson, and the walk-through that was actually
 7 performed of the Unit 2 containment, my understanding of
 8 the answer that they gave me. So I have some additional
 9 information in assessing what came forth.
 10 What I was interested in was the response of
 11 the components within the containment within both units
 12 and understanding the accelerations in Unit 1 and also
 13 the visual inspections that we performed in Unit 2. And
 14 Mr. Proulx is going to address some of the inspections we
 15 performed immediately after the San Simeon earthquake on
 16 December 22nd, as well as follow-up inspections, but I
 17 did have some other information, relative to that.
 18 MR. DRICKS: Let me add, if I may. I heard
 19 their response, and I came away with the same impression
 20 that you did, that what I thought they said was, "We
 21 measured the acceleration at the top of the containment
 22 and at the bottom of the containment of the same reactor,
 23 and they were equivalent." And somehow, it seemed to me
 24 that you were drawing a conclusion, then, about the
 25 behavior of the other containment. Maybe I

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1 misunderstood, but I heard what I thought you heard.
 2 MR. GWYNN: Could Mr. Womack perhaps clarify
 3 his answer, for the benefit of the audience.
 4 MR. WOMACK: Thank you. And yes, indeed, what
 5 I did say is we looked at the instrument at the bottom of
 6 the Unit 1 containment, we looked at the instrument at
 7 the top of the Unit 1 containment. That comprises our
 8 instrumentation on-site for the containment structures.
 9 As Mr. Jones remarked, both PG&E and the NRC
 10 conducted thorough walk-downs of the containments. Our
 11 review of the containment walkdown information for Unit 2
 12 revealed no difference in its response, and the systems
 13 and equipment housed within the containment, than we saw
 14 on Unit 1. But you are correct, I did say that we don't
 15 have an instrument on Unit 2.
 16 MS. GROOT: It was my understanding that
 17 actually, there is supposed to be some difference in the
 18 two units. But let me drop that now and go to my next
 19 question.
 20 I expected some report on the spent fuel pools.
 21 I have here the report, the January 30 report, the NRC
 22 Integrated Inspection Report, which mentions that some
 23 sensors in the control room reported sloshing in the
 24 spent fuel pools. And that got me to thinking about a
 25 whole bunch of things.

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1 You said the buildings behaved as per your
 2 modeling, your original model. Now, did the spent fuel
 3 pools behave in accordance with the model? And then, of
 4 course, I remembered that the spent fuel pools have a lot
 5 more spent fuel in them than they originally were
 6 supposed to have. So if you had a model, did you update
 7 that model?
 8 MR. BECKER: I'll start with that. The design
 9 of the plant does model that if we have an earthquake,
 10 any tank where there is a water or a fluid, the level is
 11 going to move around, just like it does in a swimming
 12 pool. If there's an earthquake, the water does move
 13 around. And so that is predicted in our design. And in
 14 fact, when the earthquake occurred, we did see that in
 15 various tanks, and we did see that in the spent fuel
 16 pool. Like you said, we did see the water sloshing
 17 around, as it's called. That's one of the reasons I
 18 talked about the control room walkdowns where there is a
 19 walkdown done, levels are checked, and then you come back
 20 later and do a second check. That's one of the reasons
 21 that we do that, is to see if, over time there really is
 22 a change in the reading.
 23 So what you said, did the water in the spent
 24 fuel pools slosh; yes, it did. Is that something that
 25 was incorporated or included in our design; I believe the

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1 answer is yes, it is.
 2 MS. GROOT: I didn't hear mention of any model,
 3 though.
 4 MR. OATLEY: We have some more answers to that,
 5 if we could, to finish the answer to the question.
 6 MR. WOMACK: I was just going to add that when
 7 you brought up the question that do we have the
 8 capability to store more fuel in the spent fuel pools
 9 than was incorporated in our original design. When we
 10 modified that design, in the mid '80s, as a part of the
 11 engineering verifications for that, we accounted for the
 12 weight, the added weight of the additional fuel in that
 13 structure, and the earthquake-driven interaction that
 14 that -- those fuel racks, the fuel could have with the
 15 structure. That was thoroughly assessed in our design,
 16 was thoroughly reviewed by the NRC, and a part of public
 17 hearings, with regard to that modification of the plant,
 18 so it was thoroughly developed.
 19 And I guess with regard to the question about
 20 modeling of water sloshing, really, that doesn't have to
 21 be anything real sophisticated. We know by experience
 22 and can predict, based upon the type of input motion,
 23 whether a tank or a pool, like the spent fuel pool,
 24 whether the water will slosh and how much or how high it
 25 will slosh. That really has no effect on what's going on

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1 down at the bottom of the pool where the fuel is stored.
 2 That is a surface effect within the pool.
 3 MS. GROOT: Thank you. And if I may make a
 4 suggestion in parting, I would suggest a bit of
 5 alternative energy for the power pools, as backup to the
 6 lost power for the sirens.
 7 MR. GWYNN: Excuse me, ma'am. Mr. Bagchi with
 8 the NRC also has some information to provide in response
 9 to your question. I'm sorry.
 10 MR. BAGCHI: You asked a very important
 11 question that it was initially licensed for a certain
 12 amount of spent fuel. Whenever they have to change the
 13 capacity, it is a license amendment. A detailed review
 14 is performed. I am familiar with the upgrade, and the
 15 model was indeed changed to incorporate the weight of
 16 additional fuel that's going to be stored there. So it
 17 was thoroughly reviewed by the NRC.
 18 MR. DRICKS: Before we continue, we have been
 19 meeting now for two and a half hours, and let me just ask
 20 the audience, do you want to take a brief five- or
 21 ten-minute break and come back and ask some questions, or
 22 do you want to keep at it? Okay. Because we have really
 23 a second meeting that's planned that's similar to the
 24 format in this, but if you want to just keep going, we
 25 will just roll along.

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1 This gentleman in the front, I know you've been
 2 waiting patiently.
 3 MR. BLOCK: Thank you.
 4 My name is Lou Block. I want to make it clear,
 5 I am here representing myself, but I am a registered
 6 geologist and geophysicist here in this state, as well as
 7 a certified engineering geologist and certified
 8 hydrogeologist.
 9 And I did want to thank PG&E for the
 10 information on the seismicity of this area, and their
 11 geologic work. I think it's been very beneficial to us
 12 locally, and it provides some of the best information
 13 that we have, not that we don't need more. And the
 14 by-product has a real benefit to our community.
 15 In this case, PG&E had evaluated some of the
 16 fault activity along the north coast and recognized this
 17 activity. That recognition was not carried through by
 18 the government agencies, so the probabilistic seismic
 19 hazard map of this area that's published by the
 20 government agencies, underestimated the type of
 21 accelerations that we would see, which was kind of
 22 interesting.
 23 I do hope that you'll be able to continue to
 24 share this information. I also teach geology and
 25 seismology at the local university. And I think it's a

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1 real benefit for us to be able to share that with the
 2 students. And if you've got a video of that seismic
 3 change in your pools, that would be really nice too. We
 4 would love to have that.
 5 One of the things -- and again, if you can
 6 provide that on-line or on CDs so we can get the color
 7 graphics, that would be helpful.
 8 I would like to request that, if possible, for
 9 the seismic data information from your seismographs,
 10 which do fill in an area which really does not have
 11 adequate instrumentation, could be tied in somehow
 12 real-time with the U.S. Geological Survey, again so that
 13 it would benefit the overall community as quickly as it
 14 does PG&E. Hopefully, there is some way to resolve the
 15 fire wall issue or whatever, and let that happen.
 16 And then just a couple questions in our
 17 evolving understanding of earthquakes that I was hoping
 18 to maybe prompt you to investigate, if you haven't
 19 already, and perhaps you have. As a result of the
 20 Northridge, Kobe, Denali, and several other earthquakes
 21 that I am sure Lloyd has been tromping the ground on or
 22 flying over in a helicopter, we've seen some vertical
 23 accelerations approaching the 1 g zone and horizontal
 24 accelerations approaching the 2 g zone, and maybe a
 25 little bit above in some cases. And it's not fair to say

1 that that's going to happen at the power plant. But it
2 would be, I think, instructive and helpful for folks to
3 understand why this new information that's been developed
4 in the last few years is not something that applies
5 specifically at the power plant, and what is it about the
6 site characteristics.

7 And then the second aspect of that is that
8 there was always a disconnect between the geologic and
9 seismologic community and the engineering community about
10 how to translate these peak ground accelerations to
11 something for an engineered structure. And I had the
12 opportunity to attend George Housner's symposium at Cal
13 Tech, where he said after 40 years, that he would back
14 off his .4 g as the appropriate acceleration for a
15 structure; that a little more work and cooperation
16 between those geologists and seismologists and engineers
17 had to occur, in order to come up with the appropriate
18 accelerations. And I am hoping that's being used to
19 reevaluate the different faults in this area, what they
20 are capable of, and how that relates to structures. I
21 think that would be very, very useful information.

22 And then secondly, we have learned a few things
23 with respect to multiple faults linking up to create an
24 earthquake, such as we saw in the Landers earthquake or
25 the Denali earthquakes, where fault segments that

1 to ask David if he wants to give his presentation,
2 because it doesn't appear that we're going to be able to
3 segue into a second meeting.

4 Would that be all right with you folks, because
5 we had planned on that.

6 MR. GWYNN: Mr. Shuman, I know, has a question
7 that specifically relates to the topic that we were
8 discussing in the first meeting.

9 MR. DRICKS: All right, Klaus.

10 MR. SCHUMANN: Good evening. My name is Klaus
11 Schumann. I am from Paso Robles. I represent the local
12 Green Party. I have some comments first, and then a
13 question.

14 Why, actually, are we here? Small earthquake,
15 far away from the plant. What is this all about? I
16 think the reason is quite clear. We have a dangerous
17 facility here. Spent fuel pools were mentioned. Each
18 one contained 15 to 20 times the cesium 137 than were
19 released in Chernobyl; 15 to 20 times each. It
20 contaminated, in Chernobyl, 12,400 square miles. The
21 county is 3,300 square miles. That's why we are here,
22 obviously.

23 I was listening to Mr. Cluff's presentation,
24 and I was struck by some of the words, and I quote, "less
25 than predicted," "probably," "uncertainties," "change in

1 previously had been said, "Well, the earthquake won't be
2 that big, because only that segment will move." But we
3 see multiple segments linking up to form larger
4 earthquakes.

5 And so in this area, again I am urging
6 understanding, it's not trying to say this should have
7 been done before, but the Los Osos Fault and the northern
8 Cambria Fault may actually be linked by a feature that
9 goes through Estero Bay, and so that's a fault that may
10 have a greater length and may be something worth looking
11 at.

12 But perhaps even more importantly, the
13 Sur/Nacimiento/Oceanic/Hausna Fault system, which
14 Clarence Hall has identified as the granitic rock
15 Franciscan basement boundary for the basement rocks
16 through this area potentially could link up and form a
17 larger earthquake as well. And I'm not sure anyone has
18 looked at that yet, but Hall has published his
19 information. And we have just had an earthquake on or
20 near that feature, so it seems like it might be
21 worthwhile looking at.

22 And I appreciate you being here. Thanks very
23 much.

24 MR. DRICKS: Thank you.

25 At this point, I am wondering if we might want

1 models," "a large, nearby earthquake would be quite
2 different." I was last summer in Germany, and I walked
3 through my college town, Marburg, and I came across a
4 geophysics department there, and there is a plaque on the
5 wall. A guy named Wagoner was celebrated there. And he
6 came up with the theory of plate tectonics. I am sure
7 all of you are familiar with that. He was considered a
8 nut case first. Then after about 30 to 40 years, I think
9 the scientific community accepted his point of view.

10 What is my point? My point is seismology is
11 very much a young science, very much in flux. We learn,
12 with every earthquake, new things. The question, the
13 real question is, here, Can we afford to have such a
14 dangerous facility in an earthquake fault zone? Do we
15 have to wait until the next big one hits before we learn
16 enough what the situation here really is?

17 The NRC often deal with probabilistic risk
18 assessments. I am sure you very familiar with this term,
19 but they are terrible in prediction. For example,
20 Chernobyl, I talked a little bit before, a classic
21 probabilistic risk assessments would have to occur no
22 more than once in six million reactor years. In reality,
23 it occurred after 500.

24 My question to you is, Will the NRC take
25 further steps towards making sure that there are no

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1 previously undetected thrust faults near and underneath
 2 the plant? We from the Green Party brought two of these
 3 questions several years ago, actually. You may recall
 4 there, at San Onofre. It was very much the same issue at
 5 stake. It was in the context of a citizen petition. I
 6 think you call it a 2.206 type of petition --
 7 MR. GWYNN: That's correct.
 8 MR. SCHUMANN: -- by Patricia Porchman. And
 9 there was an article in the Geology Magazine, I think, in
 10 October 2000, which stated that there were blind thrust
 11 faults near the plant being discovered recently, and
 12 there was a concern that the ground motions there would
 13 exceed the design, the earthquake Design Basis there.
 14 And I think you decided that it was time for the NRC to
 15 get more involved in that. I think you have exactly the
 16 same situation here.
 17 In the Tribune on Sunday, several scientists
 18 recorded saying that, and I quote here, "While USGS
 19 scientists and other geologists have said the temblor
 20 happened on the Oceanic Fault, Tinsley and" -- Tinsley is
 21 from the USGS, I believe -- "and those doing
 22 after-the-fact aerial and field mapping say the shaker
 23 may have been triggered by a previously undetected
 24 fault."
 25 I think it's your obligation to this community

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1 to check this out, whether there are undetected faults
 2 nearby and whether we really can take those risks in this
 3 kind of earthquake zone we are living, in particular, in
 4 light of piling more and more highly-reactive nuclear
 5 waste in storage there.
 6 Thank you so much.
 7 MR. SATORIUS: I'll respond, I agree with the
 8 gentlemen, in that the NRC, and more particularly, the
 9 licensee, it is their responsibility to analyze any known
 10 faults that we are able to determine, it is their
 11 responsibility and ours to review their analysis of those
 12 faults and the effect that it has on the plant.
 13 MR. GWYNN: I would add, Mr. Schumann, I am
 14 sure you are aware Senator Boxer has asked that U.S.
 15 Geological Survey increase -- and I think that it's --
 16 given the nature of the situation that this community is
 17 in, that it's a reasonable request -- that they consider
 18 doing additional mapping in this area. And certainly, if
 19 that is done and there are important new findings, then
 20 the agency would require that those important new
 21 findings be analyzed by the licensee, and our own
 22 independent technical staff would look at the results of
 23 their analysis and determine whether or not there is
 24 something here that would require a modification of the
 25 facility.

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1 In fact, there have been situations in the past
 2 where earthquake information has caused people to make
 3 decisions to permanently shut down facilities. But if
 4 you look at the body of information that's already on the
 5 record, that is the basis for the decision that this
 6 agency made that it's safe to license Diablo Canyon to
 7 operate where it is; then unless there is something that
 8 comes forward to indicate that that is not an accurate
 9 representation of the situation, this plant is licensed.
 10 I anticipate that you could have a quake that
 11 would do major damage in the county, and that that plant
 12 would continue to operate, not that it would shut down,
 13 but that it would continue to operate and provide
 14 electrical power to support emergency operations in
 15 response to that earthquake. So I don't know if Pacific
 16 Gas & Electric has anything to add to what I just said,
 17 but we require for any natural phenomenon that that plant
 18 not be adversely impacted by any expected natural
 19 phenomenon, based on history and geology or other
 20 factors.
 21 So let me give you the one good example that I
 22 am aware of where a plant has been tested by a natural
 23 phenomenon. That was Hurricane Andrew, a Category 5
 24 hurricane, that did major destructive damage in southern
 25 Florida in 1992. That Category 5 hurricane struck the

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1 Turkey Point plant head-on. I understand there were
 2 something on the order of 250,000 homes that were
 3 seriously damaged by that hurricane.
 4 The Turkey Point has four units at their site;
 5 two of those are nuclear units that meet our
 6 requirements, two are fossil-fired units that were not
 7 designed and built to withstand Category 5 hurricane
 8 forces. The two nuclear plants sustained minimal damage,
 9 and there was no impact on public health and safety at
 10 all, whatsoever, from those nuclear plants. There was a
 11 major, major disruption in the community as a result of
 12 the hurricane that hit that facility.
 13 Now, this is the largest earthquake that I've
 14 seen that shook a nuclear power plant and tested the
 15 design of the facility, in my knowledge, and we are
 16 learning from that experience. And what we've learned to
 17 date -- we are not finished -- but what we've learned to
 18 date is that the plant sustained no damage and that the
 19 impact on the facility was consistent with what was
 20 assumed in the design analysis for the plant. So I have
 21 a very strong interest, as you do, in understanding
 22 whether there are unanalyzed conditions that should have
 23 been considered. But right now, I don't have any basis
 24 to believe that there are.
 25 MR. DRICKS: Thank you. Did that answer your

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1 question?

2 Go right ahead, after you introduce yourself.

3 MS. BECKER: My name is Rochelle Becker, and I

4 am with the San Luis Obispo Mothers For Peace. And I

5 found the interpretation of the history of earthquake

6 discovery and regulation quite fascinating. I think the

7 Mothers For Peace would have a much different

8 interpretation of PG&E's ability to find the earthquake

9 fault to begin with, and retrofit their plant

10 appropriately.

11 In addition, the inability of the NRC to make

12 sure that PG&E did that, ended up costing rate payers in

13 the state of California over \$4 billion, so we would like

14 you to get it right this time.

15 I do have several questions. First, there was

16 inadequate notice for this meeting. We have been working

17 with several geologists and seismologists. There was an

18 article in the paper on Saturday. The Mothers for Peace

19 received their notice yesterday in the mail. And if you

20 really want public participation, you need to give us

21 more than five days' notice before you hold a public

22 meeting in San Luis Obispo. And Senator Boxer will be

23 told that you gave us no more than five days' notice to

24 do this.

25 We would also like a copy of the transcript,

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1 and not a summary of this meeting, and all of the

2 overheads.

3 MR. GWYNN: Our intention, as I discussed at

4 the very outset, is that we will make the transcript

5 publically available as soon as possible after the

6 meeting.

7 MS. BECKER: I just heard the word "summary" a

8 little while later, and I wanted to make sure that

9 "summary" and "transcript" meant exactly the same thing.

10 MR. GWYNN: No. The transcript, yes, ma'am.

11 MS. BECKER: Also, we have a local company who

12 is video recording this for public access television.

13 Because we didn't have adequate notice, a lot of people

14 will be watching this on public access, and we would like

15 the NRC to pay for that public access TV recording today.

16 It's not a lot of money, but it's very important to this

17 community to hear what's going on, and they are here

18 voluntarily because you didn't give anybody notice, and

19 they have not been paid, so we would like the NRC to pay

20 for this videotaped recording so the community can see

21 this.

22 Also, in PG&E's recent filing with the Public

23 Utilities Commission, they stated that there are

24 several-thousand cracks in their steam generators. And

25 so we are wondering if it's possible to assure the

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1 public, with absolute certainty, that there was no damage

2 or stress to these aging components that occurred during

3 the quake. Is it possible that damage or stress can only

4 be identified if the pipes or wells undergo X-rays or

5 other screening that is not apparent to the naked eye in

6 walkdowns. Has the NRC instituted or commissioned an

7 independent study to determine if the ground motion on

8 the Hosgri Fault is a thrust or reverse -- not reverse

9 slip -- motion, which, according to many geologists and

10 seismic experts, who were unable to attend tonight, could

11 result in greater ground motion? If yes, who has the NRC

12 commissioned to do this independent study? And if not,

13 why not?

14 If the independent geologic and seismic study

15 of faults being requested by the County of San Luis

16 Obispo Board of Supervisors and Senator Boxer results in

17 the likelihood that the Diablo Canyon plant is not

18 designed to withstand ground acceleration from a

19 7.5-magnitude thrust earthquake, what actions will the

20 NRC initiate?

21 Will PG&E's plan to rewrap the pools again,

22 beginning October 4th, with a petition to do that, cause

23 any additional sloshing in these pools? Will the

24 initiation of additional retrofits be required by the

25 NRC, without the time and the cost to the public to force

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1 the NRC to take this action? That is what has happened

2 in the past.

3 These questions are important not only to this

4 community, but to PG&E's rate payers and to the state of

5 California. PG&E did not adequately investigate faults

6 near the Diablo site before beginning construction. The

7 NRC did not independently verify PG&E's seismic

8 information in support of construction at that site.

9 This resulted in a \$2.2 billion additional cost to rate

10 payers. Then the NRC granted PG&E a license to operate

11 Diablo Canyon, only to again be surprised that Unit 1 was

12 retrofitted to Unit 2 specifications, and vice versa.

13 This mistake cost California rate payers another \$2.2

14 billion.

15 California currently faces a huge deficit, due

16 in large part to the energy industry. This state cannot

17 afford for the NRC to do anything less than a thorough

18 and independent investigation of new seismic information.

19 For the NRC to claim that our community and our state is

20 preempted from addressing safety issues at radioactive

21 facilities and then refuse to hold hearings on the

22 adequacy of seismic design of PG&E's proposed expanded

23 high-level radioactive waste storage facility is

24 irresponsible, and that is exactly what the NRC did.

25 We would have waited to take this case forward,

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1 as the NRC suggested, to reopen the full licensing
 2 proceeding, but on December 22nd, the ground shook, and
 3 it scared everyone here. And we didn't know where that
 4 earthquake was, and our sirens weren't operating, and we
 5 had no power. And we don't trust the NRC to do an
 6 independent job. Please restore the trust.

7 MR. GWYNN: Excuse me, if you don't mind. With
 8 respect to the notice that was provided for this meeting,
 9 our procedures require us to notice any public meeting at
 10 least ten calendar days in advance of the meeting. That
 11 notice was posted within the ten calendar days. In
 12 addition, we sent a notice to the local media so that
 13 they would be aware of that, and I asked Mr. Dricks to
 14 call you directly to make sure that you got that
 15 information about this meeting well in advance of the
 16 date of the meeting. So you know, I apologize that it
 17 wasn't as good as it could have been, perhaps. We will
 18 try to do better. But I think that the notice was
 19 reasonable, under the circumstances.

20 It was our desire to hold this meeting as
 21 quickly as possible, after we completed the second phase
 22 of our on-site inspection, so that we could provide some
 23 interim feedback to the community. And so you have to
 24 balance the need to get the information out, with the
 25 need to give people a lot of early notice on the meeting.

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1 And in that balance, this was the date that we landed on.
 2 Actually, I would have preferred to have held the meeting
 3 earlier, but we did not, because of the need to provide
 4 that sufficient early notice for the meeting.

5 MS. BECKER: Well, there was not early notice.
 6 I received a notice on January 16th of the recent review
 7 of what was going on, and there was nothing in that
 8 January 16th notice that mentioned this hearing. And the
 9 newspaper printed it on Saturday, and Mr. Dricks called
 10 me on Monday, and that is not ten days. And if you mean
 11 ten days, what did you do? Post it on the Federal
 12 Register and expect everybody in San Luis Obispo to read
 13 the Federal Register that day?

14 MR. DRICKS: We did post a news release on the
 15 29th, which would have been six days.

16 MS. BECKER: Well, that's not ten. I mean, in
 17 my math, it's not ten. Perhaps it's in the NRC's math,
 18 but it's not mine.

19 MR. GWYNN: Our process, which we try to make
 20 sure that people are aware of -- and unfortunately, we
 21 haven't succeeded completely, that's why I did apologize
 22 for the problem -- is to post that notice on our public
 23 website. That is the location where we post notice of
 24 all of our meetings.

25 MS. BECKER: And the public ordinarily goes to

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1 your website just to see if you are going to have a
 2 meeting in San Luis Obispo. Give me a break.

3 MR. GWYNN: For people who have an interest in
 4 what we are doing.

5 MS. BECKER: The Mothers for Peace have been
 6 following this case for over 30 years, but we don't check
 7 your wonderful website that's so easy to access, to begin
 8 with, every day, to find out whether or not you're
 9 planning on having a meeting here. Don't explain it
 10 away, just don't do it again.

11 MR. GWYNN: Thank you.

12 MS. ANDREEN: Thank you. Patty Andreen from
 13 Avila Beach. I'm a neighbor, almost next-door neighbors.
 14 My concern, again, as expressed by other
 15 speakers, is with the sirens. And I believe I heard
 16 something that the County and FEMA administer the siren
 17 system; is that correct?

18 MR. GWYNN: That is correct.

19 MS. ANDREEN: Okay. Would the NRC license a
 20 facility like this without a siren warning system?

21 MR. GWYNN: No, we would not.

22 MS. ANDREEN: Okay. And then is it always
 23 arranged this way, that it is the County and FEMA that
 24 administer it?

25 MR. GWYNN: That is the normal process that's

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1 used. We've seen that for a lot of communities, the
 2 siren system is used for multiple purposes. For example,
 3 a plant might be located in a community where there are a
 4 lot a chemical facilities, or it might be in a community
 5 where there are frequent tornados, other types of
 6 phenomena, either natural or man-made, that require alert
 7 notification. And so it's typical to see that the local
 8 officials are the ones that administer the alert
 9 notification system, because they have greater value than
 10 just for the nuclear power plant. In fact, for those
 11 that are located around chemical facilities, they are
 12 used much more frequently for problems at those
 13 facilities.

14 MS. ANDREEN: Thank you. And if I could follow
 15 up. Was the system here installed as a result of the
 16 construction of the power plant? Does anybody know?

17 AUDIENCE: Yes.

18 MS. ANDREEN: Okay. Then, I guess the thing I
 19 am struggling with, and I don't have enough background,
 20 obviously, just from those two questions, is that if the
 21 sirens were required as a condition of the licensing and
 22 were installed here because of the construction of the
 23 power plant, is there a desire on the part of PG&E to
 24 work with the county in making sure that we have the best
 25 warning system possible?

1 MR. OATLEY: We have been working with the
 2 County continuously to look at how we can improve on our
 3 communication between each other, about how we can notify
 4 the population. And, you know, the siren system is built
 5 in accordance with pretty much national standards. There
 6 was a comment earlier about use of solar power or other
 7 renewable sources. And we do use that for some of the
 8 sirens. And for daylight hours, it does provide power in
 9 remote locations. Of course, nighttime, that won't work
 10 too well. But we have worked out a system, obviously, as
 11 I mentioned before, with the County, where there are
 12 other ways of communicating with the population.

13 MS. ANDREEN: If I wanted to ask more questions
 14 about that, where I wasn't taking up everybody's time,
 15 would there be one of you that I could contact to talk to
 16 about that?

17 MR. OATLEY: Yes. We can make someone
 18 available to talk to you and then let you know who the
 19 County representative would be also.

20 MS. ANDREEN: Perfect. Thank you very much.

21 MR. GWYNN: Thank you.

22 MS. HYMAN: Natalie Hyman. I am really deathly
 23 more afraid of you and what you do than any earthquake.
 24 And I am one of the people -- and I didn't know other
 25 people had the same reaction. But the first thing we did

1 something may have happened in yours.

2 What kind of follow-up are you going to have,
 3 other than your normal inspections and what you already
 4 walked through, on cracks you can't see? Will you
 5 magnaflux major parts? Thank you.

6 MR. GWYNN: Would Pacific Gas & Electric like
 7 to respond to that question?

8 MR. OATLEY: Yes.

9 MR. WOMACK: Let me start out, you used a term
 10 called "magnafluxing." Magnafluxing is a method of
 11 nondestructive examination. And it's commonly used in
 12 power plants, industrial environments, in order to detect
 13 cracking in metallic components. We use, at Diablo, many
 14 methods of nondestructive examination. Predominantly
 15 that falls within the categories of ultrasonic exam and
 16 visual and -- my mind is escaping me -- any current exam,
 17 excuse me. It's getting late.

18 And we do this throughout the plant, on a
 19 periodic schedule. The examinations that we did after
 20 the earthquake did not give us any indication that we
 21 needed to go out and do special inspections at that point
 22 this time.

23 To your point, I can appreciate that in your
 24 basement a new crack might have formed. We have a lot of
 25 concrete structures, reinforced concrete structures,

1 as we ran out from breaking glass and falling objects in
 2 the house, went outside -- we are on a bluff point in
 3 Shell Beach -- sat on the ground and timed a minute and a
 4 half of rolling motion by the earth. Our first thought
 5 was, "We are okay." And our second thought was, "What's
 6 happening at Diablo?" And as my husband inelegantly put
 7 it, "It's our ass that's downwind."

8 And so we wanted to find out what happened. We
 9 finally did, from relatives who live in Pasadena. That's
 10 how we got our information, much later. And then to find
 11 out the warning systems didn't work, but that question
 12 has already been talked. But there is one I would like
 13 to follow up from Mothers For Peace, about the cracks.

14 Yesterday, we discovered another crack in our
 15 basement -- yes, some California houses do have
 16 basements -- and we didn't know it was there. And we are
 17 discovering continually there is more damage than we
 18 realized at first. So when I got first reports that
 19 Diablo said, "We are okay," I went, "How do they know?"

20 We know that not so long ago, you had some
 21 potential failures in some of your parts. And the only
 22 way you knew it was by magnafluxing it. And you went to
 23 the extra effort before you were required to do that, and
 24 we appreciate it. But we've had something stressful
 25 happen. Everything shook in our house, and I imagine

1 actually, at Diablo. And as I mentioned earlier, as a
 2 part of what we call, under the Regulation, the
 3 Maintenance Rule, 10CFR 50.65, we are required to survey
 4 all those structures periodically.

5 Now, as our civil engineers on our staff went
 6 and looked at the plant, they identified nothing
 7 abnormal. Now, we have quite a lot of concrete at the
 8 plant, so I can't speak absolutely that, you know, some
 9 small crack didn't initiate. But believe me, we walked
 10 the facility down extensively. The NRC, as well, walked
 11 the facility down extensively, looking for exactly those
 12 types of indications.

13 Now, in our upcoming refueling outages, we will
 14 do more extensive review, both of the structures -- and,
 15 I believe, NRC will come back to Diablo and look
 16 independently. And at that point in time, what we call
 17 our in-service testing program will go into full swing,
 18 and we will look at everything from the steam generators
 19 that Ms. Becker referred to earlier, to pipes, welds,
 20 both visually and with other forms of nondestructive
 21 examination.

22 And again, I guess I have to go back to a very
 23 important point. And I don't at all want to sound
 24 cavalier in this regard. We have a facility that was
 25 designed, as we depicted in one chart, at some

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1 frequencies for in excess of 2 g's. This event that we
 2 had was very, very small, in comparison to the design
 3 that we have implemented at Diablo. So I, myself, am not
 4 surprised that we have not seen indications of cracking
 5 visually. In fact, that's probably one of the earliest
 6 and easiest things to see in response to an event like
 7 this, so I am personally not surprised.
 8 But to your point, we will, as a part of our
 9 license requirements and compliance with national codes
 10 and standards, we will be inspecting more thoroughly in
 11 the course of the upcoming fueling outages.
 12 MR. JONES: I would like to provide some
 13 additional insights and answer as far as the NRC's
 14 responsibility. As I indicated, we have both Mr. David
 15 Proulx and Terry Jackson, two of our on-site specialists,
 16 safety inspectors, who were there. They also
 17 independently walked down the facility, looking for any
 18 indication of any damage to any components, anything that
 19 would tell us that there was movement of components,
 20 anything associated with any hangers that would say that
 21 structures had moved and therefore, we needed to look
 22 further.
 23 We understand the Design Basis of the facility,
 24 and we looked at the San Simeon earthquake and its effect
 25 on the facility itself. The ground motions of both

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1 horizontal and vertical, as I talked about earlier, were
 2 very small, relative to the design of the facility.
 3 But our inspections in that area are not over
 4 yet. Mr. Proulx will talk about, in a little bit, is we
 5 have additional inspections ongoing to look at the
 6 design; the design, as well as the in-service inspection
 7 activities. There's a nondestructive inspection of the
 8 facility coming up in the refueling outage scheduled for
 9 the March time frame. And we also have additional
 10 walkdowns that are going to be performed of the facility,
 11 in particular of the Containment 1 Unit, during that
 12 refueling outage.
 13 We have already independently walked through
 14 the facility, including the Unit 2 Containment, and we
 15 found no evidence of any damage that would say that there
 16 would be a challenge to that design; and therefore,
 17 questions involving integrity of the systems and
 18 components within Diablo Canyon.
 19 Ms. Becker brought up several questions that we
 20 are going to go back and look at in the transcript,
 21 because we want to make sure we address those. But one
 22 of them dealt with the steam generator tubes, and that
 23 was the inspections and the shaking of those tubes
 24 themselves. Those will be examined during this upcoming
 25 outage.

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1 The NRC, through our independent inspection
 2 programs will also look at those examinations and
 3 independently review the results of those examinations.
 4 Whether or not there is evidence of any damage to those
 5 tubes, part of the design speaks to the integrity of
 6 those tubes and their ability to continue to operate, is
 7 based on the tube integrity throughout the operating
 8 cycle, including the effect of the Hosgri earthquake;
 9 that is, the ground motions that would be sensed from
 10 that.
 11 So we have both the design aspects, we have the
 12 independent examinations, through nondestructive
 13 examinations, and the NRC will independently follow up
 14 and review, through our baseline inspection program,
 15 those inspection activities that are ongoing.
 16 MR. SATORIUS: Bill, if I can add a couple
 17 other things. It's been our experience when we perform
 18 inspections, that typically systems, piping systems,
 19 valves and pumps and pumping and the associated hangers,
 20 that if they have undergone stresses, such as you see
 21 during a seismic event -- and there are other type of
 22 activities that take place in the plant, in other plants
 23 where we've had similar sort of stressing, although not
 24 from seismic, and those are involved with refilling
 25 piping systems that have been taken out of service and

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1 drained. And if they are not refilled properly, if
 2 you've ever had your house worked on, where the plumber
 3 has to re-turn on the water, if he doesn't do it right,
 4 it makes the pipes rumble. Those are seismic-like events
 5 or stresses that are similar in nature.
 6 It's been our experience, in inspecting these
 7 systems, that typically, if you induce stresses strong
 8 enough to challenge the integrity of the welds, you see
 9 physical deflections of the piping supports, and you see
 10 other damage. Our walkdown inspections have revealed
 11 none of that type of damage.
 12 To follow up further, on Bill's example with
 13 the steam generator tubes, the agency has put into place
 14 strict regulations on the monitoring of leakage, when
 15 those plants are operating through the steam generator
 16 tubes. And it's monitored and required to be monitored
 17 very, very carefully on a daily basis. And our
 18 inspectors, our safety inspectors that are on-site,
 19 review those, those leak rates for any sort of deviation
 20 or change, such that we have confidence that gives us any
 21 type of advance warning of any problem within those
 22 components.
 23 MR. WOMACK: In fact, I was about to add --
 24 thank you, Mark -- we have very sensitive instrumentation
 25 that both monitors the reactor, reactor coolant system

1 for leakage, and also monitors the leakage through the
2 steam generator tubes. It's very capable. We will know
3 immediately if that leakage changes.

4 So kind of again, as background for my earlier
5 comments, we saw no change of that type, either for our
6 reactor coolant system, or for leakage associated with
7 the steam generators.

8 MR. BECKER: We talked a lot about walkdowns.
9 I just wanted to add, in the days following the
10 earthquake, we did additional system testing, where we
11 actually -- we test ran equipment, that was above and
12 beyond what was required by our license or by our
13 procedure. But we went out and took some equipment and
14 test ran it, to make sure that there was no problem
15 following the earthquake.

16 In addition to that, we do extensive equipment
17 testing every day, as a condition of our license. And
18 since the earthquake, we have not had any failures of any
19 of that equipment that could be attributed to the shaking
20 from the earthquake.

21 MS. HYMAN: May I make a comment on your words
22 "walkdown." It gives the impression of walk-by,
23 "visually, it looks okay." It's just a bad terminology
24 because your words "extensive testing," words like that,
25 really give a better sense of safety.

1 still have damage.

2 So it's in 1977, I was in Romania in a big
3 earthquake, and the big damage was 250 miles from the
4 earthquake in the Danube, River where ground failed and
5 there was extensive liquefaction and so forth. So maybe
6 you could get one of your local geologists -- Lou was up
7 here a moment ago -- and ask him to take a look at where
8 the site is, and perhaps that could explain why there is
9 a crack. Our power plant is on solid ground.

10 MS. HARRIS: Good evening. My name is Denise
11 Harris, and I'm at the County of San Luis Obispo Office
12 of Administration and Board of Supervisors. And I just
13 wanted to say thanks to all the public for coming out. I
14 am coming here tonight because I've had the privilege of
15 starting on the day of the earthquake at that office,
16 working on the Emergency Operations Center, with Mr. Ron
17 Alsop and Mr. George Brown.

18 I'm hearing comment about the sirens not
19 working. One, I didn't know about that; and two, those
20 are the two gentlemen that we need to get in contact
21 with. And if you have that information five minutes --
22 are you out of Arlington, Texas?

23 MR. DRICKS: Yes.

24 MS. HARRIS: If you had that five minutes
25 outside of when this occurred on the 22nd, our Emergency

1 MR. SATORIUS: That's a good point, and I'll be
2 the first to admit that's almost nuclear jargon. It's a
3 word that we all use. And you are right, it should be
4 clarified. It is not a walk through the park or a walk
5 through the plant. And oftentimes, I know with our
6 inspection procedures, it's oftentimes, it's a
7 hand-over-hand examination of piping. It's a looking
8 underneath. It's using mirrors. It's using flashlights
9 so that you can actually see if there has been deflection
10 or any sort of damage. That's a good point, and we
11 should be mindful of the public and some of the terms we
12 use. Thanks.

13 MR. OATLEY: Lloyd would like to make one
14 comment.

15 MR. CLUFF: I would like to make an observation
16 from, I think it was Mary Lee that spoke about the length
17 of shaking, which doesn't surprise me. And I would
18 suggest that perhaps the site conditions of where you
19 live might be conducive to causing the response of where
20 you live. I didn't recall where it was, but sometimes
21 you can have site response that will cause the shaking to
22 be longer, and then you get ground failure from
23 liquefaction, and so forth. And if you were in a
24 water-saturated situation with sand, you could get cracks
25 that could be a hundred miles from the earthquake and

1 Operations Center on Kansas Avenue was working and
2 operational. I believe their number was 805-781-4444. I
3 just wish the communication could have been better, I
4 guess. I don't know how the public is not hearing about
5 the sirens not working.

6 And have you or PG&E spoken with either of
7 these two gentlemen on the procedures of how the public
8 will be notified?

9 MR. OATLEY: We work extensively with George
10 and Ron with the County's office, and we also work
11 regularly with David Edge, the County Administrator.

12 The notification to the County is the first
13 responsibility of the licensee, PG&E, in this case. We
14 are required by our license to notify the County within
15 15 minutes of an event. And I think, as Mr. Becker
16 mentioned, we notified within 12 minutes. I was out at
17 the Emergency Operations Center. I too went out after
18 the event, to work with the County Administrator and
19 folks at EOC.

20 As far as notification on the sirens, that
21 information is available right at the Watch Commander's
22 office at the Emergency Operations Center. And the
23 County was aware of that immediately, so there was no
24 need for us to communicate that to them. That
25 information now is direct with the County.

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1 As far as the media, we did make notification
 2 to the County immediately. We did make a press release
 3 in a very short time period. I don't have that in front
 4 of me. I know we've been criticized in other public
 5 meetings about the media, within ten minutes of the
 6 earthquake, stating that Diablo Canyon is okay, and how
 7 would we have known that, only within ten minutes. Our
 8 press release did say that Diablo continued to operate
 9 through the earthquake. It never said that we were okay.
 10 We were saying we were doing walkdowns. But some people
 11 apparently heard, within an extremely short period of
 12 time the status of Diablo Canyon, because we have been
 13 criticized about that in other public forums.
 14 MR. SATORIUS: I would just like to clarify one
 15 thing. And it's my understanding. I got to our OP
 16 center about fifteen minutes, ten or fifteen minutes,
 17 about the same time maybe, I think, you did. Maybe you
 18 were there a little bit sooner, Pat. But I think we were
 19 getting information from the resident inspectors in the
 20 control room at about the five-minute point. I think it
 21 was a little bit later than that we found out about the
 22 sirens. I don't think we knew about the sirens at the
 23 five-minute point. It was a little bit later. So maybe
 24 there was a -- we weren't clear. We were getting
 25 information from the residents on the condition of the

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1 plant at about the five-minute point, but the siren
 2 status came a little bit later, at least through the
 3 control room to us. Although it was important, we are
 4 using those first few minutes to verify the condition of
 5 the plant and the safety of the plant.
 6 MS. HARRIS: Thank you. I also want to make a
 7 comment that it's been my job to log in the comments on
 8 the reply cards of the PG&E mailer that's been going out,
 9 about the evacuation zones of the Diablo Canyon Power
 10 Plant. There's about 700 records that have come through
 11 of people commenting, and they are all concerned about
 12 the evacuation of our highway system here, and a few
 13 other things. And the data is available if anybody at
 14 PG&E wants to get that data back.
 15 Thank you.
 16 MR. DRICKS: Thank you.
 17 MR. GWYNN: I would like to remind the audience
 18 that we have some additional presentations that we want
 19 to make this evening, if you would like to hear it. But
 20 we'll continue to take questions, as long as the
 21 questions come forward.
 22 MR. FRANK: My comments will be brief. My name
 23 is Fred Frank. I live in Atascadero. I appreciate that
 24 you came here. I would appreciate if you would give us
 25 more notice. I think if you want public input, it's very

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1 important to notify the public. I learned about this
 2 this weekend, a lot of calendar juggling, and I got here.
 3 But a lot more people would have been here, had we had
 4 better notice.
 5 MR. GWYNN: Let me respond, and I really,
 6 really appreciate this feedback. As I indicated to
 7 Ms. Becker earlier, we were trying to juggle the desire
 8 to get the information out as early as possible, with the
 9 giving advance notice of the meeting. And I can assure
 10 you that we will have another meeting, and that we will
 11 make sure that it's noticed well in advance, in as many
 12 ways as we can, so that everybody who has an interest
 13 will have an opportunity to attend that meeting.
 14 I anticipate that that meeting will occur in
 15 May. I don't know the exact date yet. But as soon as we
 16 know those dates, we'll get those published.
 17 MR. FRANK: Thank you.
 18 Most of my questions have been answered, not
 19 necessarily to my satisfaction. I would like to follow
 20 up on Mrs. Groot's comments on the spent fuel pools. I
 21 noticed in your report that in your walk-through, you
 22 noticed that the pools appeared to be clear. I would
 23 hope that there is a little more inspection that takes
 24 place than just simply peering in the pool. And I was
 25 wondering, did you receive any changes in the filtrates

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1 that were pulled out of the pool, the spent fuel pools?
 2 I realize it was a rather minor earthquake.
 3 But if there were some increases in radioactivity
 4 captured in the filtrates, I would like to know, because
 5 if we did have a more serious earthquake, that could be a
 6 problem.
 7 MR. JONES: As I indicated earlier, we did have
 8 both the specialists and the safety inspectors on-site,
 9 walking down the facility, and after that, including an
 10 extensive observation of systems. In addition to that,
 11 we had a regional safety inspector on-site. And those
 12 individuals did look at the spent fuel pool for clarity.
 13 They looked for any indications of leakage. They looked
 14 for any indications that there had been movement of the
 15 fuel racks or any indication of the fuel itself.
 16 And based on those direct observations by those
 17 individuals -- and I believe we have documented that in
 18 the attached inspection report excerpt that is included
 19 in the background package -- these were specifically
 20 looked at. And that included in the clarity of the
 21 system itself.
 22 MR. GWYNN: If there was any damage to the fuel
 23 that's stored in the pool, the first indication that you
 24 would expect to get is gaseous activity; in other words,
 25 radioactivity released from the pool in the form of light

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1 gas that would go up into the atmosphere inside the
 2 building. The radiation monitors inside the building
 3 would alert the operators --
 4 MR. FRANK: That's what I was asking.
 5 MR. GWYNN: -- and there was nothing like that,
 6 absolutely no indication.
 7 The clarity of the water indicates that either
 8 the pool is extremely clean or that there wasn't much
 9 disturbance of whatever might be sitting on the bottom of
 10 the pool.
 11 MR. FRANK: I wouldn't expect us to see very
 12 much, considering the earthquake at this site was rather
 13 minor. I am more concerned about a more serious
 14 earthquake, closer to the plant, and how that is going to
 15 affect the spent fuel storage, because, as Mr. Schumann
 16 said, it's an extremely dangerous situation out there,
 17 and I think we should not take any position that would
 18 leave any cause for error. And so we should not take the
 19 opinion -- and I understand there is a quite a difference
 20 of opinion with respect to the intensity of earthquakes
 21 that could occur there. And so I think we should make
 22 sure that we are not dealing in opinion here, and that we
 23 study this very thoroughly and as soon as possible.
 24 Thank you.
 25 MR. BAGCHI: The Diablo Canyon spent fuel pool

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1 structure is especially robust because it's located on
 2 bedrock, partially embedded, and it is made out of very,
 3 very thick reinforced concrete walls. And those walls
 4 are -- they are lined with stainless steel liner.
 5 MR. FRANK: I am familiar with the structure of
 6 the pool. I am more concerned about the assemblies and
 7 the assemblies banging together and so forth, and
 8 degradation of the fuel rods and this type of thing. So
 9 that's my concern about the spent fuel pool. I've got a
 10 lot of other concerns as well.
 11 Thank you.
 12 MR. DRICKS: At this time, I would like to beg
 13 the indulgence of the audience, the fingers of our
 14 stenographer are faltering. We would like to take a
 15 brief break for five minutes, and then reconvene, move
 16 into a different format. And we will start with David
 17 Proulx, the resident inspector, will give you unit
 18 description of his activities, and then we will throw it
 19 open for additional questions.
 20 (Brief break taken.)
 21 MR. DRICKS: I think we did promise this young
 22 lady that we would give her the first chance to ask the
 23 next question. She's been waiting patiently, so let's do
 24 that.
 25 MS. DUNBAR: My name is Connie Dunbar. I live

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1 in Arroyo Grande. I want to concur with Klaus Schumann
 2 that the reason that we are here tonight, that the event,
 3 whatever it was, an earthquake, it could have been
 4 something else, was within the design specifications and
 5 the modeling that you all did. If it had been outside,
 6 we might not all be here. And the big picture is that
 7 the coincidence of earthquakes and a huge amount of
 8 radioactivity is a threat to our community. We live with
 9 that threat. We try to forget about it, but it is a
 10 threat to our community. And I would like very much if
 11 we could find every means possible to lessen that threat.
 12 I know you believe that's what you are doing, but then
 13 when I hear something as simple as the sirens don't work,
 14 think of how I would feel, in terms of trust.
 15 My other point is that this power plant does
 16 create a huge amount of stress in our community, and yet
 17 only provides approximately between 6 and 10 percent of
 18 the electricity that Californians use. For the price of
 19 a good used car, I put solar panels on my home that
 20 produce a hundred percent of my electricity.
 21 You are talking about billions of dollars that
 22 could possibly -- can we think, does PG&E maybe have a
 23 plan of how we could produce energy that would be less of
 24 a threat to our community?
 25 Mr. Lloyd -- I didn't get his last name --

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1 suggested that almost all design block structures were
 2 meant to withstand 2.5 g's. And my question would be,
 3 Which ones are not? Can anybody answer that question?
 4 Which design block structures in the plant itself are not
 5 meant to withstand that?
 6 MR. CLUFF: I'm sorry. I don't still
 7 understand your question.
 8 MS. DUNBAR: There was a nice graph, and I'm
 9 not the expert in these g's. But the statement was
 10 "almost all design block structures are engineered to
 11 withstand 2.5 g's." Does that make sense?
 12 And so my question is, Which structures are not
 13 designed to withstand that?
 14 MR. WOMACK: I think the slide that Lloyd Cluff
 15 was referring to at that point depicted the Hosgri
 16 spectrum, which goes as high as a little over 2 1/2 g's.
 17 And I think the comment that he made was, in looking at
 18 the spectrum -- and he remarked that most of our power
 19 plant structures are or respond in the range of 2 to 8 Hz
 20 or cycles. I don't believe he said that most of our
 21 structures are designed to this spectrum. I think he
 22 said most of them fall in this range.
 23 MS. DUNBAR: He did say, "fall in this range."
 24 So what falls outside the range?
 25 MR. WOMACK: I don't know, off the top of my

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1 head. But the structures that fall outside of that range
 2 are likewise designed to that requirement, for the
 3 appropriate frequencies, so they are designed to that
 4 requirement. And again, Lloyd made a generalization to
 5 say most of our structures have natural frequencies of
 6 response in this area of 2 to 3 Hz.
 7 MR. GWYNN: Now perhaps I'm a little bit
 8 confused, because I know that you have some
 9 administrative office buildings, for instance, that are
 10 located at the site. They are not necessarily a part of
 11 the power block structures, but they are on-site. Are
 12 they enveloped by these design criteria?
 13 MR. WOMACK: No. Our administrative buildings,
 14 our offices, are not designed to these criteria.
 15 MS. DUNBAR: And I wouldn't expect that.
 16 I want to make a comment that I am a little
 17 uncomfortable that almost all of the seismic data that
 18 people are looking at, the USGS included, is PG&E's data.
 19 And Lloyd told us there was not a direct link of that
 20 data to USGS, because of fire wall concerns.
 21 PG&E has a billion-dollar application going on
 22 for the dry cask storage facility. That's a huge amount
 23 on the line. And I don't want to say that they are not
 24 being truthful, but they have a huge investment in this
 25 earthquake not being something that we take very

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1 seriously. So I am concerned about the credibility of
 2 the seismic data not being authenticated from another
 3 source.
 4 And then one last comment is that we were just
 5 trying to be comforted that if something happened in the
 6 steam generator tubes, that there were monitors that
 7 would notify everyone that something was happening in
 8 those tubes, even if it couldn't be seen in those pipes.
 9 And I know that that was one of the concerns at Indian
 10 Point, that there was actually a rupture in one of those
 11 steam generator tubes that the monitors did not detect.
 12 I want to leave with the comment again
 13 that in whatever we say tonight, whatever assurances you
 14 try to give us, the coincidence of radioactivity and
 15 earthquakes puts our county at risk, at huge risk. We
 16 live with this threat all the time. Is there not
 17 something we can do differently to generate the power
 18 that we need?
 19 Thank you.
 20 MR. DRICKS: If I can respond to one of the
 21 points you made just now. At Indian Point, the rupture
 22 of the steam generator tube was detected. I think what
 23 the licensee said, and the NRC said in press releases,
 24 was no radiation associated with the event could be
 25 detected. So I think there was a slight confusion there

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1 off-site.
 2 MR. SATORIUS: And another clarification with
 3 regard to the NRC examines the capabilities and license
 4 of the operators of nuclear power plants, including
 5 Diablo Canyon, and we specifically will test them, prior
 6 to issuing them a license, on their actions that they
 7 would take in the event there would be a failure in one
 8 of the tubes of the steam generator. I understand there
 9 are thousands of tubes in each steam generator.
 10 MS. DUNBAR: If this plant -- knowing what we
 11 know now, if this plant came up for licensing now, would
 12 a license be granted?
 13 MR. SATORIUS: I'm not -- if it met the
 14 conditions and the NRC requirements, the answer would be
 15 yes.
 16 MR. DRICKS: Before we take any more
 17 questions --
 18 MS. DONNAGAN: Actually, I've been waiting a
 19 really long time. I only have a couple of comments and
 20 two questions. I'll be very quick, brief, and I know the
 21 other person behind me will as well.
 22 My name is Lorraine Donnagan. I am a professor
 23 at Cal Poly, local university, and more importantly, I am
 24 a concerned citizen. This is my very first official
 25 meeting. And that's why I am here. I am a concerned

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1 citizen, and I am also a mother of two young girls, a
 2 wife, and a daughter of both my mother and father. And I
 3 live only a couple of miles from Diablo Canyon, and I am
 4 wondering where the NRC -- I know that I walked in in the
 5 midst of introductions. How many of you live within a
 6 crow's -- a couple of you live close.
 7 MR. GWYNN: Let me just make a comment, from my
 8 own experience. I used to do the job that Terry and
 9 David do now. And, of course, have family, a wide
 10 spectrum of ranges, since we are talking with -- ages,
 11 since we are talking about spectrums tonight. But when I
 12 was doing their job, I felt that it was important for me,
 13 as a member of the local community, to live within the
 14 emergency planning zone for the facility that I was
 15 assigned to inspect, because if I couldn't have
 16 confidence that my family was safe, then how could you
 17 have that type of confidence?
 18 MS. DONNAGAN: And now, you are no longer
 19 living here?
 20 MR. GWYNN: That's because I am inspecting this
 21 facility. I have a different responsibility today. But
 22 we don't require our people to take that approach. On
 23 the other hand, I certainly encourage them. And both of
 24 our local inspectors live in the local community and not
 25 far from the emergency planning zone for Diablo Canyon.

1 Because of the size of the -- I should say the
2 distance of the plant from most of the local population
3 center, it's very difficult to find a place to live
4 that's within the ten-mile emergency planning zone of
5 Diablo Canyon.

6 MS. DONNAGAN: Thank you.

7 I guess, again, I am coming from a first-timer
8 point of view. I don't see a lot of distinction between
9 this table and this table (indicating). I am not sure
10 which one wags which, and that could be my lack of
11 knowledge, experience. But I can tell you right now, as
12 a concerned citizen, I don't see any distinction. It's
13 all very gray. I see that you're kind of working
14 together, not necessarily policing. And I feel that
15 that's maybe the role of NRC.

16 So I also have a couple comments about the
17 siren failure and the power failure, et cetera, with
18 that. And your comment, Mr. Oatley, was that you had
19 thought about that, and that really alarmed me that you
20 had thought about that. And I am wondering if that
21 thought was documented in your lessons-learned document
22 that apparently was generated after the earthquake. And
23 if this is a public document, I would love to get my
24 hands on that public document.

25 MR. OATLEY: This is not a public document.

1 It's an internal PG&E document. But let me address your
2 concern on the sirens. When I said we thought about it,
3 it has to do with when we first licensed Diablo -- when
4 the NRC first licensed Diablo Canyon, we had to install
5 and test our siren system to prove its effectiveness.
6 And as part of that, we did think about what would happen
7 in the event there was no power to the sirens, and worked
8 with the County of San Luis Obispo to put in place
9 compensatory measures, in the event there was no power to
10 the siren. That's a possibility, because power does get
11 lost. You could have mechanical malfunction of a siren
12 at any time, so we thought about the possibility of a
13 siren not working or not being powered, and that's what I
14 was trying to say.

15 MS. DONNAGAN: Okay.

16 MR. SATORIUS: If I could maybe respond to one
17 comment that you made just a little bit earlier.

18 MS. DONNAGAN: Sure.

19 MR. SATORIUS: And that was your comment that
20 you had a difficult time discriminating between -- the
21 distinction between the two tables.

22 MS. DONNAGAN: Yeah.

23 MR. SATORIUS: And I would offer that -- first
24 of all, I would ask you to take a look at the inspection
25 report that was published on January the 30th, and

1 excerpts of it are available and were passed out. That's
2 not the whole report. That's only the report talking
3 about the earthquake, because we wanted to focus on that
4 at this meeting. But it's available on our public
5 website, and it's pretty easy to get to. I would take a
6 look at that. You'll see how we don't agree with some of
7 the issues over at that table (indicating), and it's
8 written there for all the public to review and to
9 understand.

10 Now, on matters like this earthquake matter,
11 where the facts were pretty much, we believe, well-known,
12 and we understand the facts, we've looked at them
13 independently, when we come to similar conclusions, this
14 is what you can see, is that we have come to similar
15 conclusions, based on our own independent verification of
16 some of the inspection activities that our inspectors
17 performed. But I ask you to take a look at the
18 inspection report, because you'll see where we don't
19 agree.

20 MS. DONNAGAN: Okay. I will do that. Thank
21 you.

22 And my question is, Did you not measure Unit 2?
23 I get this impression that you measured the top and the
24 bottom of Unit 1, and that you -- I got a couple coughs,
25 when then someone else took over, when it talked about

1 measuring the digital versus the analog, and then -- and
2 how you took the noise out of the analog, and then the
3 digital worked, and then the digital and the analog
4 worked. That sounds like tweaking to me. And this is,
5 again, me, on the outside looking in. And then, on the
6 measuring devices, I am not understanding the
7 discrepancies between the measuring devices. So if you
8 could clarify that, please.

9 MR. WOMACK: Yes. And again, what I said
10 earlier is that the instrumentation system to monitor the
11 structural response is installed on the Unit 1 at the
12 base of the Unit 1 containment and at the top of the Unit
13 1 containment. As Mr. Cluff indicated in other slides,
14 we have sensors in other locations around the plant. And
15 the purpose of these is to really measure the response of
16 the buildings so that we can confirm that the design we
17 made follows the models that analyze their response.

18 So now to the point, we don't have an
19 instrument at the bottom or at the top of the Unit 2
20 containment, because it's not necessary in order to
21 verify the response of the facility. What we did say
22 earlier is we walked down both the Unit 1 and the Unit 2
23 containments, and let me use the right term, we did a
24 thorough visual inspection.

25 MS. DONNAGAN: The new term.

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1 MR. WOMACK: That is what "walkdown" means in
 2 the nuclear business, and conducted that, and found no
 3 indications of problems with either containments.
 4 MS. DONNAGAN: Can you address the digital
 5 versus the analog measuring devices and why you filtered
 6 out noise out of the analog in order to match it with the
 7 digital?
 8 MR. WOMACK: We have two recording systems for
 9 each location. The audiotape recording system, much like
 10 a cassette you'd use in an old cassette player, and a
 11 more modern digital system.
 12 MS. DONNAGAN: And the old one is the one that
 13 was noisy?
 14 MR. WOMACK: The old one, when we presented the
 15 information to the manufacturer of the system, they
 16 indicated to us that the recordings were in part faulty
 17 because of the age of the tapes and the design of the
 18 system. The digital system that we had installed -- and
 19 I am not certain when we installed it -- recorded the
 20 information for each of the sensors accurately.
 21 MS. DONNAGAN: Okay.
 22 MR. GWYNN: I'd like to just make a brief
 23 comment on your comment about the independence of our
 24 safety organization. That perhaps -- and I can only say
 25 perhaps -- the reason why you don't see that distinct

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1 difference that you might have thought that you might
 2 see, is because of the nature of the work that Pacific
 3 Gas & Electric typically does at Diablo Canyon. If, in
 4 fact, you find a utility-operating facility substantially
 5 outside of compliance with your requirements, you'll find
 6 us acting in a very different way with that utility. You
 7 can talk to the owner and operator of the South Texas
 8 project facility, two large, 1250-megawatt electric units
 9 that are located about two hours outside of Houston,
 10 Texas. Those two units were shut down for over a year
 11 while they were responding to safety issues that this
 12 agency identified at their facility.
 13 And so, you know, if, in fact, you have a
 14 licensee that's in substantial compliance with your
 15 requirements, and they're doing a good job of protecting
 16 the health and safety of the public with operation of their
 17 facility, then you won't see us in a forum, such as this,
 18 taking strong regulatory positions with them, because
 19 that's not necessary. Does that help?
 20 MS. DONNAGAN: So are you saying that you are
 21 taking strong regulatory -- are you saying that that's
 22 why you are here?
 23 MR. GWYNN: We are an independent safety
 24 agency. We do all of our work using our own employees,
 25 doing our own inspections. We evaluate the results of

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1 those inspections. And to the extent that we find
 2 compliance with NRC requirements, then we are satisfied.
 3 MR. SHUKLA: I would like to add to Mr. Gwynn's
 4 comment. I'm the NRC project manager for Diablo Canyon,
 5 responsible for interface between PG&E and NRC
 6 headquarters, Washington, D.C.
 7 I agree with you when you say, and it appears
 8 that NRC is working together with PG&E. Yes, we are
 9 working together, but only to insure public health and
 10 safety. Other than that, we don't believe a word they
 11 say to us. Okay. We have 3,000 people working with NRC
 12 for independent review. We also employ national labs,
 13 universities, like yours. Dr. Rueger and his staff has
 14 done a very good job of analyzing the San Simeon
 15 earthquake, so we do everything independent. And you
 16 will not see it, but if you look into more NRC websites,
 17 you'll find out that we shut down basically more than two
 18 years for the same reasons, it's not safe to operate, so
 19 we would not hesitate to shut down a unit if it's not
 20 safe. But we are very independent.
 21 MS. DONNAGAN: Okay. Thank you very much.
 22 MR. DRICKS: We'll take one more question, and
 23 then we'll change the format. You've been promised an
 24 opportunity.
 25 MS. BEZAK: Thank you. My name is Susan Bezak.

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1 I just had a couple of follow-up questions. I am
 2 specifically concerned about the containment around, or
 3 the lack of containment around the spent fuel. Maybe you
 4 could describe the spent fuel structure and units to me a
 5 little bit better, because I believe there is nothing
 6 that would contain any release of radioactive gases at
 7 this point in time; is that correct?
 8 MR. OATLEY: I'll try to answer this, and then
 9 Larry Womack will add any data that can help. So let's
 10 talk about the construction and structure for the spent
 11 fuel building.
 12 MS. BEZAK: Yes.
 13 MR. OATLEY: The pool itself is a steel liner,
 14 stainless steel liner. It's surrounded by reinforced
 15 concrete that's about 6 feet thick, of concrete. Much of
 16 the spent fuel pool is actually below ground and sits on
 17 bedrock. The area above the pool is surrounded by a
 18 building which contains the atmosphere around the pool.
 19 If there was any release of radioactivity within that
 20 building, we have installed radiation monitors that would
 21 alarm the control room, and we would take action
 22 appropriately to route the air through filters, to
 23 filter out any radiation prior to it being released, and
 24 there would be additional monitors looking at that, to
 25 make sure that those releases were within our license

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1 conditions.
 2 So the basic structure of the pool is it's
 3 mostly below ground, 6 1/2 feet of concrete reinforced,
 4 sitting on bedrock.
 5 MS. BEZAK: How deep are they?
 6 MR. OATLEY: The pools themselves are about 20
 7 feet deep?
 8 MR. WOMACK: More than 40 feet deep. A fuel
 9 assembly is a little longer than 12 feet, which leaves
 10 approximately 23 to 25 feet of water above the fuel.
 11 MR. OATLEY: So the area at the top of the
 12 fuel, which is, say, nominally, 12 to 14 feet, top of the
 13 fuel down to the bottom, is actually below ground.
 14 MS. BEZAK: I was just trying to imagine a
 15 scenario; as I understand it, I believe there is some
 16 areas of the north coast that -- where the ground has
 17 shifted as much as one foot, ground elevation. Is that
 18 true, Mr. Cluff?
 19 MR. CLUFF: I was with Lou Rosenberg in a
 20 helicopter flying over, and he made statements that in
 21 some places, some of the cracks were a foot wide and
 22 sometimes they had moved vertically. I don't recall
 23 exactly how much it was. But that would be minor,
 24 compared to real ground movement in an earthquake.
 25 MS. BEZAK: Right. Well, considering those two

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1 things together, would you say that there is any
 2 possibility that the spent fuel pools would have reason
 3 to be suspect in a worst-case scenario kind of earthquake
 4 situation? The reason I am asking is because -- well,
 5 maybe I should let you answer that.
 6 MR. CLUFF: Well, the answer is a simple no.
 7 And the way the structures are built and imbedded in the
 8 rock, even if there was --
 9 MS. BEZAK: I thought they were sitting on
 10 rock, not imbedded in rock.
 11 MR. CLUFF: They are sitting on rock, but they
 12 are carved out so they are inset in the rock.
 13 MS. BEZAK: I would like to see that diagram
 14 sometime.
 15 I still don't understand why there is no
 16 containment beyond just a shed roof and filtration system
 17 for radioactive gas release. It just doesn't follow,
 18 whether it's an earthquake or some other kind of an
 19 outside factor resulting in a release of radioactive
 20 gases. That, to me, is a serious oversight. And we keep
 21 talking about the plant, and the plant has been built and
 22 rebuilt and retrofitted to withstand the earthquakes that
 23 we are all here talking about; however, in many cases, I
 24 think the biggest threat is the radioactive releases
 25 coming from the spent fuel pools.

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1 And I would just have to say that, you know, we
 2 have to consider that release as a result of some kind of
 3 an earthquake activity in that area. And to me, that's
 4 just a complete oversight in what we've been talking
 5 about tonight.
 6 MR. DRICKS: If I can respond to that, the only
 7 way you could get that kind of release is if the water
 8 drained out of the pool and was not replaced.
 9 MS. BEZAK: Right.
 10 MR. DRICKS: And the licensee has programs in
 11 place that were designed to insure that doesn't happen.
 12 In the worst-case scenario, they would pump water into
 13 the pool to keep that fuel covered, so that kind of
 14 gaseous release of radioactivity, we don't believe, is
 15 feasible.
 16 MS. BEZAK: Well, I feel like it's a big
 17 oversight in the entire plant's design and overall, you
 18 know, configuration of the plant spent fuel pool. There
 19 is a big gap there in securing our safety from
 20 radioactive contamination.
 21 MR. BAGCHI: Well, the world over, there is
 22 nowhere the containment of fuel would be --
 23 MS. BEZAK: Nowhere?
 24 MR. BAGCHI: Nowhere.
 25 MS. BEZAK: That's a shame.

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1 MR. GWYNN: Well, it's based on good
 2 engineering science.
 3 MS. BEZAK: Right. And we live with
 4 radioactive contamination more and more in our lives, and
 5 we live with more and more cancers. And a lot of people
 6 don't necessarily like to put those together but, in
 7 fact, there is some relationship.
 8 I just had a couple of comments about the
 9 sirens. There was some -- I believe Mr. Oatley commented
 10 that some of the sirens have a solar backup, but it's
 11 only operational during the day. I thought solar was
 12 collected and operational beyond daytime, nighttime, when
 13 the sun is not shining, so that doesn't sound accurate to
 14 me.
 15 MR. OATLEY: I may have been wrong. Let me
 16 check.
 17 MS. BEZAK: You do know about solar and how
 18 that works, because I was just flabbergasted when you
 19 said that.
 20 MR. OATLEY: Could I answer your question for a
 21 moment?
 22 MS. BEZAK: You bet.
 23 MR. OATLEY: I've just been corrected. They do
 24 have a battery backup. They are operable.
 25 MS. BEZAK: So even if the sun is not shining,

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1 they will be operating. That's good. I am feeling a lot
 2 better about that, seriously.
 3 Also, the fact that Diablo Canyon's power
 4 produces about 6 to 10 percent of California's power. I
 5 don't believe any of that power comes to this county. Is
 6 that correct?
 7 MR. OATLEY: That is not correct.
 8 MS. BEZAK: And could you explain that a little
 9 more specifically, what comes to this county from Diablo
 10 Canyon.
 11 MR. OATLEY: I'd love to. And I would like to
 12 correct some misstatements. Diablo Canyon provides 20
 13 percent of the power to the PG&E service territory;
 14 sometimes as much as 25 percent of the power. It does
 15 provide 10 percent or greater of the power to the state
 16 of California. It's connected to the 500 kV system,
 17 which is in turn connected to the local area providing
 18 power. Power from Diablo is distributed not only
 19 locally, but across the whole state and to other states,
 20 as necessary.
 21 MS. BEZAK: Where does it get distributed
 22 locally?
 23 MR. OATLEY: Through the distribution locally.
 24 MS. BEZAK: Not through, but to, is my
 25 question.

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1 MR. OATLEY: To all the residents and
 2 businesses in the local area.
 3 MS. BEZAK: All the residents and businesses?
 4 MR. OATLEY: That are connected to the PG&E
 5 electric system, that's correct.
 6 MS. BEZAK: What percentage of the local users
 7 are PG&E?
 8 MR. RUEGER: Let me say, first of all, you
 9 cannot identify exactly where from one power plant the
 10 power gets to a local residence, because the system is
 11 fully integrated and connected together. So you look at
 12 the total sources, to be able to meet the needs of
 13 northern and central California that we support. So in
 14 essence, the best you could say is that, like the rest of
 15 our service territory, about 20 percent of the energy
 16 that is utilized in a typical year by the local
 17 community, comes from Diablo Canyon.
 18 MS. BEZAK: Well, I was asking about this in
 19 all sincerity, because it was my impression that it
 20 wasn't used locally. And there was some comment tonight
 21 about the power being out, locally, in areas. And my
 22 assumption was, it wasn't coming from Diablo, so there
 23 wasn't a connection there. I am glad to have that
 24 clarified. Thank you.
 25 MR. JONES: I wanted to address one point. It

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1 deals with the emergency sirens. And I wanted to
 2 reiterate that the resident inspectors, the safety
 3 inspectors we have on-site, reported to the control room
 4 and observed the licensee's implementation of their
 5 emergency plan in this case for the Notification of
 6 Unusual Event. That emergency plan and communication
 7 with the local and State officials, there was no -- the
 8 emergency sirens were not called upon to actuate. There
 9 was no need for those sirens to have actuated.
 10 Now, as a result of that, there were other
 11 means, backup means, put in place to notify residents,
 12 had it become necessary. So the fact that the emergency
 13 sirens, 56 sirens, I believe it was, were not actually
 14 available, did not mean that individuals in those areas
 15 would not have been notified, because there were backup
 16 measures established that are part of that, should the
 17 sirens actually go out, to provide notification to
 18 personnel. So I kind of got the feeling that people
 19 thought that they would not have been notified of the
 20 need to evacuate, had the decisions by the State and
 21 local officials, been -- or local officials, to initiate
 22 evacuations, and that is just not the case.
 23 MS. BEZAK: I respect that. I do have to
 24 comment that the idea of evacuation is a joke, in my
 25 opinion. And that if there were significant release of

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1 radiation, my property, which lies 3 miles from Diablo
 2 Canyon, as the crow flies, would be rendered useless.
 3 And I just see, you know, there is really no point in an
 4 evacuation if parts of our county are suddenly dosed with
 5 radioactivity, much like Chernobyl, which was not
 6 expected. It doesn't make sense.
 7 And I have to go back to some of the comments
 8 earlier made, that coming to these meetings, it
 9 flabbergasts me that we are talking about a small amount
 10 of electricity produced, that could be produced in other
 11 ways, and we are spending all this incredible money, and
 12 people's valuable time, all of your valuable time,
 13 talking about this ridiculous stuff. It just doesn't
 14 make sense to me.
 15 MR. RUEGER: Let me correct one thing. It is
 16 certainly not a small amount of electricity. This is the
 17 largest generator in the state of California, us and San
 18 Onofre, the two nuclear facilities.
 19 MS. BEZAK: Yes. And in the power shortage, we
 20 saved just about that much. It was at least 10 percent,
 21 and I can't remember the exact figure, but it was quite
 22 remarkable, and it was quite significant, so we can do
 23 better. Compared with the threat that we live with,
 24 that's what we are talking about here tonight. We are
 25 talking about a threat, a significant threat.

1 MR. RUEGER: That is your own belief. That's
2 not universally held.

3 MS. BEZAK: That is my own belief.

4 MR. GWYNN: I'd like to just give a little bit
5 of a response to the concept of applying what happened at
6 Chernobyl to what might happen in the United States. I
7 had the unfortunate opportunity to visit that facility
8 two years after the accident occurred. I was a member of
9 a 19-person delegation from the United States government
10 that went to the former Soviet Union to try to assist
11 their country in improving the safety of their nuclear
12 facilities.

13 That plant did not have a containment, as U.S.
14 plants have. The design of the reactor core itself was
15 such that it could have a low-level nuclear detonation in
16 the core. U.S. nuclear facilities are designed such that
17 that can't happen. The nature of the fuel moderator --
18 and I am sorry for the use of the technical term, but the
19 thing that makes the nuclear fission reaction itself
20 work, in the Soviet union, these reactors were used for
21 dual purpose -- to generate heat and power for the local
22 community, and to make plutonium for bombs. We don't do
23 that in the United States.

24 But because of their desire to generate
25 plutonium, they were using graphite as a moderator. And

1 land, on the people. And so I just take some exception
2 to the comparison of the Chernobyl accident to something
3 that might happen in the United States, because I don't
4 believe that that is a reasonable comparison. We would
5 not allow those reactors to operate in this country.

6 MS. BEZAK: I actually was not intimating that
7 Chernobyl can happen here, necessarily. I think I am
8 intimating that something similar, not in the reactor's
9 flaw, but something that is unpredictable, which we are
10 learning about all the time as we go through life. And
11 all of you have to agree to disagree with me that nuclear
12 power is a good source of energy, because that's your
13 job. You are nuclear physicists and probably all support
14 the idea of nuclear power is great.

15 Thank you for your time, and do take this very
16 seriously, because we live with it every day. Thank you.

17 MR. GWYNN: Thank you.

18 MR. DRICKS: I think at this time, we would
19 like to ask our Senior Resident, David Proulx, to talk
20 about some of his inspection activities. And he will
21 give you an overview of the work that we've done so far,
22 and what we plan to do.

23 MR. SATORIUS: One thing I would add is I would
24 beg the indulgence, Dave's presentation is pretty
25 thorough, but it is relatively quick. The hour is late.

1 that graphite is like the charcoal that you use in your
2 backyard grill. So when they had a low-level nuclear
3 detonation in the core of that reactor, it resulted in a
4 significant fire in that graphite, that burned for a very
5 long period of time, and with no containment.

6 Then, the radioactive materials that were in
7 the core were distributed about the countryside, and even
8 here in the United States, to a very small extent. That
9 was a very, very serious concern for this country, and we
10 went over to help them to improve the safety of their
11 reactors.

12 But in the United States, we've had one serious
13 reactor accident at Three Mile Island. You probably have
14 heard about that accident. The nature of the
15 radioactivity release that occurred there was in the form
16 of noble gases. They were radioactive gases, but they
17 are gases that don't interact chemically in nature. They
18 were typically very lightweight gases, which means that
19 they rise straight up, and disperse in the atmosphere.

20 And if you look at the impact of the local
21 community, other than the fact that people are afraid,
22 and that's unfortunate, but if you look at the impact on
23 the local community as a result of that accident in the
24 United States, where a significant portion of the reactor
25 core was melted, there is virtually no impact on the

1 If you could let him get through his presentation,
2 possibly without questions; following that, then we will
3 open the floor back up.

4 Dave.

5 MR. PROULX: Okay. Once more, I am David
6 Proulx. I am the Senior Resident Inspector at Diablo
7 Canyon. To my right is Terry Jackson. He also is
8 Resident Inspector at Diablo Canyon. We are NRC
9 employees, but we live in this area, and we are members
10 of this community. We work each day at Diablo Canyon
11 Power Plant. We do independent inspections and
12 verifications that the plant is operating safely on a
13 daily basis.

14 And in completing our safety mission, we were
15 actually at the plant on December 22nd, when the quake
16 occurred, so not only did the quake incur us a lot of
17 inspection activities, it was also a very personal
18 hardship on us as well.

19 Now, in the follow-up to the San Simeon
20 earthquake --

21 MR. GWYNN: Just to clarify what he meant by "a
22 personal hardship." I have to thank the dedication of
23 these public servants because like many of you, their
24 families were located much closer to the earthquake than
25 what the plant was, and their children were afraid. And

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1 they stayed at their posts and did their jobs until we
 2 allowed them to go home. And that's the dedication that
 3 our people have to protecting your health, in the
 4 operation of this station. And so I just wanted to
 5 clarify what David meant by that.

6 Thank you, David and Terry, for doing that for
 7 us.

8 MR. PROULX: Thanks, Pat.

9 In the NRC's response to the San Simeon quake,
 10 I was the lead inspector. The NRC's inspection
 11 activities consist of three phases. Phase 1 was the
 12 immediate response by we resident inspectors; Phase 2 was
 13 the supplemental inspection that occurred about two weeks
 14 later, from January 5th to 9th, and included we resident
 15 inspectors, with myself as the lead, and a civil engineer
 16 from our Arlington office. Now, Phase 3 is our ongoing
 17 and future efforts, which include continued inspections
 18 of the plant and review of the special reports.

19 Don't need to get into the design of the plant
 20 because that's been talked quite a bit, but we did
 21 determine that the San Simeon earthquake resulted in .4
 22 g's of seismic acceleration, which was very small, as
 23 compared to the Design Basis of the plant -- .04.

24 In discussing Phase 1 of our inspection, just
 25 as the earthquake struck, one of we resident inspectors

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1 responded directly to the control room. And I
 2 immediately contacted the Region 4 office and NRC
 3 headquarters to communicate that the earthquake had
 4 occurred, and to establish the NRC's monitoring of the
 5 Plant, and NRC response.

6 In our response to the control room, we
 7 verified tank levels, insured that PG&E was following
 8 their earthquake procedure, initiating the emergency plan
 9 in performing their required inspections of the plant.

10 Within a few hours, we began our own
 11 independent inspections of the plant. These were not a
 12 quick run around the plant, but actually a thorough
 13 inspection of each of the plant areas, that began soon
 14 after the earthquake and lasted well into the evening and
 15 into the next day. And they included such things as the
 16 backup power supplies, the diesel generators, the
 17 emergency core cooling systems, auxiliary feed water, the
 18 spent fuel pool and its auxiliary systems, and the
 19 buildings that house these items. And the types of
 20 things we were looking for is supports that had come
 21 loose, whether or not there was any differential movement
 22 between buildings and between components, and whether or
 23 not there was any cracks in the foundations of
 24 structures.

25 Phase 2 of our efforts occurred from January

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1 5th through 9th. The team included we resident
 2 inspectors, with myself as a lead, and a region-based
 3 civil engineering specialist. Our inspections included
 4 more detailed inspections of the plant facility, which
 5 included myself and the civil engineer going into the
 6 Unit 1 containment and verifying that the cooling systems
 7 in the containment were intact -- into the Unit 2
 8 containment; that the seismic ap was maintained, and that
 9 there were no other cracks in the foundation this side of
 10 the containment.

11 In addition, we reviewed the licensee's Event
 12 Response Team results and the special report that they
 13 initiated within 14 days of the earthquake. Our review
 14 of this special report revealed that there was additional
 15 data that was required to be submitted, and PG&E
 16 committed to submitting a supplement to that special
 17 report.

18 Phase 3 includes our ongoing efforts. From now
 19 until the refueling outage, we will be continuing to
 20 perform continuing inspections of the plant. During the
 21 Unit 1 refueling outage, we are going to enter the Unit 1
 22 containment and go into the areas that are uniquely
 23 available during the outage. In addition, we will be
 24 reviewing the supplemental report, and we have will have
 25 a regional specialist come and review the examinations

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1 that the licensee does of wells and steam generator
 2 tubes.

3 And our inspections to date have indicated
 4 there was no damage to the facilities in our visual
 5 inspections. In our conclusion, the NRC inspection was
 6 of three phases. Phases 1 and 2 are complete. And the
 7 NRC inspections were prompt, thorough and independent.
 8 There was no damage to the facility. PG&E's response was
 9 good to the event, though they learned many lessons. The
 10 NRC is confident that the plant is safe, following the
 11 San Simeon earthquake, based on inspections to date, and
 12 that the earthquake was well within the Design Basis of
 13 the plant.

14 Our work is not complete. And as new
 15 information is gathered, it will be considered and acted
 16 upon. But our inspections to date have given us adequate
 17 confidence that Diablo Canyon is safe, following the
 18 San Simeon earthquake, but we still have more inspections
 19 to do. And when we come up with those results, we will
 20 also communicate those to the public.

21 MR. SATORIUS: Thanks, David.

22 I think Pat had mentioned earlier that
 23 inspection activities will continue through the March
 24 outage, where we will look at the other containment
 25 building. We anticipate the final result of all of our

1 inspections will be issued in an inspection report that
2 will be issued near the end of April.

3 We would look, then, to have a public meeting
4 at some point following that, to communicate to the
5 members of the community the final results of our
6 inspection.

7 So with that, Victor, I think we are at the
8 point to reopen.

9 MR. DRICKS: We have -- we'll reopen. I know
10 we have a woman who would like to ask some questions.
11 She's been waiting patiently.

12 MS. MELLOW: Thank you very much. Gentlemen,
13 please forgive me if I do not have a great deal of
14 confidence in -- regarding the safety of the plant. It's
15 interesting, just this week in our local paper, it says,
16 "Cheating reported on security exercise at the Y2 nuclear
17 weapons plant last summer in Oakridge, Tennessee."

18 It goes on to say, "Security guards who
19 repelled four simulated terrorist attacks at a Tennessee
20 nuclear weapons plant had been tipped in advance,
21 undermining the encouraging results, the Energy
22 Department's watchdog office said Monday. A broader
23 investigation uncovered evidence of cheating during mock
24 attacks against U.S. nuclear plants over the past two
25 decades." Local paper. This is the Telegram.

1 magnitude 6.5 San Simeon earthquake. That quake and
2 subsequent aftershocks likely have relieved underground
3 pressure on the northcoast faults. But pressure on the
4 central coast section of the San Andreas has been
5 building for more than a century.

6 The Santa Lucia range and the county's noted
7 seven sisters volcanic mountains are stark evidence of
8 past quake activities here. The last major rupture of
9 the San Luis Obispo stretch of the San Andreas Fault was
10 a magnitude 7.9 in 1857. So the area is overdue. It's a
11 rubberband ready to break," one of the geologists
12 reported.

13 Gentlemen, I have no doubt you are attempting
14 to minimize the risk the Diablo Nuclear Plant poses to
15 the thousands of men, women and children who live here.
16 The truth is, you cannot make an inherently unsafe plant
17 safe. The indisputable facts are these: More
18 devastating quakes will occur, quite possibly much closer
19 and much stronger, and you cannot predict with certainty
20 what results may occur. Equipment and machinery will
21 fail, plant workers will make mistakes, saying nothing of
22 terrorists seeking a target.

23 Given knowledge of the nearby Hosgri Fault,
24 this nuclear plant would never have been built in its
25 unsafe location. Downwind communities never would have

1 MR. GWYNN: Did you state your name for the --

2 MS. MELLOW: My name is Marian Mellow,
3 M-e-l-l-o-w.

4 MR. GWYNN: And Marian, I have to admit that
5 the Nuclear Regulatory Commission only regulates the
6 commercial uses of nuclear materials in the United
7 States. And so for those security exercises, we do
8 conduct force-on-force exercises where we test licensees'
9 security forces. Those exercises are done under very
10 strictly-controlled conditions.

11 What occurred at those facilities that are not
12 regulated by this agency, I can't answer. But I can tell
13 you that the scenarios that our people use, the nature of
14 the exercises that we conduct is such that you won't find
15 that type of cheating on an NRC-administered,
16 force-on-force exercise.

17 MS. MELLOW: I would certainly hope not.

18 Another article, again this is from January
19 30th. It says that, "The next temblor could hit farther
20 south. Geologists say that SLO," San Luis Obispo, "or
21 Atascadero might suffer the brunt. Two Federal
22 geologists believe the county's next severe quake could
23 be centered in San Luis Obispo, Atascadero or elsewhere,
24 closer to the San Andreas Fault. That next one could
25 cause significant, significantly more damage than a

1 allowed it. I was mayor of Pismo Beach then. We were
2 never given that fact, and it should have been known.
3 And that plant would not be here, and you wouldn't have
4 had the opportunity to approve it.

5 Well, we know about that fault now. And to
6 allow that nuclear plant's license to be extended, and
7 even more deadly nuclear waste to be stored at that site,
8 would be criminal disregard for public safety. I ask you
9 to make recommendations regarding future operation of
10 that plant, as if it were your children and your
11 grandchildren who are at risk. Please use your position
12 to help protect public safety, not gamble with it, if you
13 value the lives of the men, women and children who live
14 here.

15 I ask you, with all sincerity, please recommend
16 closure of that plant before there is a major
17 catastrophe. To even consider expanding its license, to
18 even consider storing more waste, spent fuel in these
19 casks that they propose to build, it's insanity. Public
20 safety should come before profits for PG&E. Thank you.

21 MS. PALAIA: I'm Joyce Palaia. I live in Avila
22 Beach. I know that the independent dry cask storage
23 facilities will be constructed shortly. Have they
24 undergone seismic studies, and will they be built to
25 withstand a major earthquake?

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1 MR. BAGCHI: It is still under review. Final
 2 judgment has not been given by the NRC, but the seismic
 3 part of it, I am aware of; that they have been reviewed.
 4 And let me remind you that these casks are completely
 5 passive. They have very substantial earthquake
 6 resistance, much more than the reactor block itself.
 7 MS. PALAIA: Really?
 8 MR. BAGCHI: Yes, ma'am. You ought to look at
 9 the nature and the construction of these casks. These
 10 casks are required to go through a drop test. And the
 11 drop test itself creates 33 g's or more, substantially
 12 greater than any earthquake that will be produced here.
 13 MS. PALAIA: So they will probably stay on?
 14 MR. BAGCHI: I'm personally convinced -- this
 15 is my personal opinion -- that those casks are very safe.
 16 MS. PALAIA: Safer than Yucca Mountain?
 17 MR. BAGCHI: There is no comparison between
 18 these dry casks and Yucca Mountain. These dry casks are
 19 licensed for a certain period of time, considerably less
 20 than Yucca Mountain.
 21 MS. PALAIA: There is a major concern about
 22 when they'll be transported to Yucca Mountain, if ever,
 23 transportation, so forth.
 24 Thank you.
 25 MR. KILROY: Good evening. My name is Rick

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1 Kilroy. I live in Morro Bay. I appreciate you all
 2 taking the time and staying so late and harboring our
 3 comments and criticisms. And one of the observations
 4 that I made tonight, listening to Mr. Cluff over there,
 5 quite intelligent. I've learned a lot, and also listened
 6 to the other geologist. Kind of a lesson. It's been
 7 quite enlightening. I feel like I've gotten some real
 8 cutting-edge information, stuff that's not in the
 9 textbooks, not in the stuff in the models that we've
 10 created, that we stand by as engineers.
 11 I'm a marine engineer by trade. And one of the
 12 things that he pointed out that I found interesting is
 13 his latest information regarding the effects of
 14 earthquakes on long distance. For the longest time, I
 15 was always afraid of the Hosgri Fault. But I've
 16 realized, based upon his information, that we need to
 17 consider more damaging earthquakes further away, as far
 18 as 220 miles, according to his information. I think this
 19 should be taken into account when we are looking at the
 20 relicensing of the nuclear facility, and of any new
 21 applications, including dry cask nuclear waste.
 22 Thank you.
 23 MR. BAGCHI: May I just point out that
 24 San Andreas Fault was talked about for the licensing of
 25 Diablo Canyon. A very large earthquake was located at

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1 San Andreas fault at the closest proximity from the site,
 2 and that ground motion does not control the earthquake
 3 design of the plant. The most controlling earthquake
 4 comes from the Hosgri site, Hosgri Fault.
 5 MR. KILROY: That's not been proven.
 6 MR. BAGCHI: Based on our assessment of all the
 7 seismic hazards, all the sources that contribute to the
 8 seismic ground motion at the site, that is the most
 9 concerned --
 10 MR. KILROY: I was just taking into account
 11 Mr. Cluff's innovative and latest technology, which I
 12 found very intriguing.
 13 Thank you.
 14 MR. SCHUMANN: Good evening, again. Thanks for
 15 staying so long tonight. My name is Klaus Schumann from
 16 Paso Robles. I addressed you a little earlier, and I
 17 wanted to address a few issues which have come up this
 18 evening. One is the myth of the pools being underground.
 19 That is only partially true. The water level in the
 20 pools were at 139.6 feet above sea level. The ground
 21 level is 115 feet, so the difference would be about 24
 22 feet, so the majority of the pools are above ground, not
 23 below.
 24 The more important thing is, however, that we
 25 would have only about one foot of water above the top of

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1 the spent fuel assemblies. That is within the 3 feet the
 2 NRC has identified as the critical level for when the
 3 water starts boiling. So if you want to keep that in
 4 mind when we talk about the pools being underground, that
 5 is quite misleading.
 6 The Chernobyl comparison, I agree where the
 7 chairperson, if you compare the reactors, this cannot
 8 happen in the United States. It's quite obvious and has
 9 been well established. The comparison may be more
 10 applicable to the spent fuel pools, because the spent
 11 fuel pools can catch fire as the water drains or even
 12 partially drains, which may be even a more dangerous
 13 situation, which has not really been identified by the
 14 Nuclear Regulatory Commission as such because with
 15 partial drainage, you could get a thermal reaction
 16 creating hydrogen, so that may be something else, or if
 17 the partial water blocks the air from cooling the spent
 18 fuel assemblies, it might take extra long to do something
 19 about it.
 20 But in any case, the zirconium fire could be
 21 comparable to the graphite fire at Chernobyl. It could
 22 last for a long time. And, of course, the amount of
 23 radioactivity in the pools is far higher than in the
 24 reactors' magnitude, several folds. There is no
 25 containment around the spent fuel pools. And the

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1 buildings could, of course, be compromised through an air
 2 attack, or something like that. So this would be the
 3 more applicable comparison.
 4 I want to also address shortly the issue the
 5 gentleman brought up, saying that there is no containment
 6 over any of the spent fuel pools in the United States.
 7 That is definitely correct, but there is a very good
 8 reason for it -- because every one of the pools was
 9 designed for a very different purpose than they are used
 10 for now.
 11 The design -- Diablo Canyon's pool, the design
 12 was built and licensed for about 500 spent fuel
 13 assemblies. We have now, I think, about 506, I think, is
 14 the exact number. I think it's 1 1/3 reactor cores. So
 15 if you get at 193 fuel assemblies in reactor core, 1 1/3
 16 is about 250, by 2 is about 500. So maybe 506. The
 17 gentleman over there would probably know better what is
 18 the exact number.
 19 In any case, we have now at the present time
 20 1800, roughly, spent fuel assemblies there. We will
 21 have, in the year 2006, 2200, so it is more than four
 22 times the amount the pools were originally designed for.
 23 There is not only a matter of quantity. This is also
 24 quality difference. The difference is that there is low
 25 density, there is only 250 spent fuel assemblies in the

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1 pools. Temperatures were never that critical that you
 2 would have to worry too much about a spent fuel pool fire
 3 occurring. This is an extremely important difference.
 4 What you have created, NRC, by licensing is
 5 actually two more sources of potential nuclear
 6 catastrophe out at Diablo Canyon. When the plant first
 7 licensed, we were talking about the reactors. And the
 8 reactors would have never been licensed without
 9 containment, obviously. There is containment, we get a
 10 license. That is what the community was told we would
 11 have to worry about. But since reworking and the
 12 four-fold, almost five-fold amount of spent fuel
 13 assemblies in the pools, you've created two additional
 14 sources which the people here were never told about.
 15 And my question specifically to you is, Why are
 16 you against the returning those pools to low density,
 17 eliminating those two additional sources, which everybody
 18 is quite correctly worried about? The cost for the
 19 modification is rather marginal. I have heard estimates
 20 as little as six-hundredths of a cent of cost to the
 21 kilobyte hour. Now, they may be not quite correct, or
 22 may be a little bit more than that. Even if it's a penny
 23 or two, it's still very, very little cost to returning
 24 those pools to the original design. That was how the
 25 community was told about how the spent fuel pools would

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1 be designed, when the plant was originally licensed.
 2 There is low-density designs to lower the risk of a pool
 3 fire nearly to zero.
 4 I want you to think about that and I'd
 5 appreciate it if you really give it a thorough analysis
 6 on this, because the cost for returning is not that high,
 7 given all the other costs, but you would benefit quite
 8 substantially.
 9 MR. GWYNN: I would like to make two comments
 10 in reply, and I think that you have some very thoughtful
 11 comments. I thank you for them.
 12 The first comment in reply is that whether or
 13 not a zirconium fire can occur in a spent fuel pool is a
 14 matter that is debated amongst various experts. And to
 15 the best of my understanding and knowledge at this time,
 16 the NRC does not ascribe to the theory that it is a
 17 credible accident in a spent fuel pool. My belief is
 18 that if the agency believed that that was a credible
 19 accident, then there would be action taken to mitigate
 20 the potential consequences of such an accident. That's
 21 my belief.
 22 The second comment that I would make is that I
 23 don't know why you have the impression that we are
 24 opposed to restoring the spent fuel pool to its original
 25 design density. I'm just not sure where that comment

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1 came from.
 2 MR. SCHUMANN: Well, the NRC has so far refused
 3 to talk about it in public sessions. This has been
 4 brought up, I think. It is not a new suggestion. This
 5 topic has been in front of the NRC for at least 25 years.
 6 The problem is, since 9/11, it has come much more into
 7 focus again. This is an old problem. But 9/11 has
 8 focused the problem again in the mind of the public. And
 9 you mentioned the accident; I agree. An accident is very
 10 unlikely to cause a spent fuel pool fire. The acts of
 11 malice, we are concerned about.
 12 And the NRC has basically stated since 1982
 13 that such an event could not happen in the United States,
 14 the 9/11 type of event. We know better now, obviously.
 15 So such an event can happen in the United States, and
 16 we'd better prepare for it. Because on the one hand you
 17 have allowed PG&E to pile up much, much, more waste than
 18 the public was told originally what the plant was
 19 licensed for, so there are much more risks involved,
 20 certainly in terms of quantity.
 21 MR. BAGCHI: Those are license amendments and
 22 they are subject to public comments. Every time the
 23 capacity is increased, that is reviewed thoroughly by the
 24 NRC. Personally, I have been involved in the technical
 25 committee's study on zirconium fires, and there are some

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1 risk implications out of that. And it is considered to
 2 be well within the NRC commission statement on allowable
 3 risk.
 4 MR. SCHUMANN: Yeah. One in 10 million. I
 5 think that's the number, if I recall it. The only
 6 problem with the probability risk assessments are that
 7 they don't include human error, not acts of malice, and
 8 those are the two most likely sources. So if I take the
 9 thing in 1987, human error contributed to 74 percent of
 10 the 2,930 mishaps in that year. So if you exclude human
 11 error, you will skew the results, in terms of the
 12 probability risk assessment. I think that's quite
 13 obvious.
 14 MR. BAGCHI: We did have a human error expert
 15 on that committee that wrote the report, and they did
 16 consider human error. But I am not an expert in that
 17 area, so I cannot comment.
 18 MR. SCHUMANN: But terrorism is definitely not.
 19 It has been always very consistently stated by the NRC
 20 that this is not something we should have to worry about;
 21 and therefore, it was always considered to be in the
 22 realm of speculative. And the conclusion the NRC always
 23 drew, since it cannot happen in the United States, we
 24 don't have to ask the operators to prepare for this
 25 event. 9/11 has changed all that; I think we all agree

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1 about that.
 2 And as long as you continue using probabilistic
 3 risk assessment, which includes those two aspects, they
 4 are no good. It is simply no good. And using it as
 5 justification to increase the risk to the population
 6 makes no sense to me.
 7 In any case, so I would very much -- actually,
 8 I got some hope from your remarks, Mr. Chairman, saying
 9 that you may consider in the future, or hopefully with
 10 the application of PG&E now, that the spent fuel pools
 11 will be returned to the low-density design. I think that
 12 would be the best step you could take for assuring more
 13 safety margins for the populations here.
 14 And by the way, that is proposed by the
 15 consultant of the County, as you may know, for the
 16 building permit for the environmental impact report
 17 concerning the proposed IFSSI. You know, the consultant
 18 for the County has proposed that. And as far as -- I
 19 understand has come with some questionable argumentation
 20 to know why that could not be done. I think it is quite
 21 obvious it can be done. It's a matter of spending the
 22 money, wanting to spend some money.
 23 But I think if you want to subject the
 24 community to much more increased risk through much more
 25 nuclear waste, far more, I think it's nine times more

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1 than the plant was originally licensed for, then I think
 2 you have every obligation to guarantee the safety of the
 3 residents, as much as one can. And returning it to
 4 low-density spent fuel pools would be a very important
 5 step towards that. And I would appreciate it. And thank
 6 you for considering it.
 7 MR. GWYNN: Thank you.
 8 MR. DRICKS: Thank you, again, Klaus.
 9 Do we have anyone else? The hour is getting
 10 late, and I would beg your indulgence. If you've already
 11 spoken once, we'll let you go ahead.
 12 MS. MELLOW: It will take about ten seconds.
 13 MR. DRICKS: Okay.
 14 MS. MELLOW: Gentlemen, especially the one that
 15 spoke about allowable risk. You know, allowable risk
 16 depends on where you live and who is at risk. And I
 17 don't believe that you have the right to increase the
 18 risk of a nuclear disaster that could kill thousands of
 19 people that live here. I think you need to remember
 20 that. Thank you.
 21 MR. DRICKS: Do we have anyone else who would
 22 like to ask questions or speak, who hasn't? If not, I
 23 think I'll turn the floor over to Mark.
 24 MR. SATORIUS: Thanks, Victor. The hour is
 25 late. When we came out here, we kind of had it planned

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1 that we would have -- and I guess we need to take this as
 2 a lesson learned, when we have these meetings again in
 3 the future. If we have two, we need to allow for more
 4 time or start them earlier, although it's hard to start
 5 them earlier because it gets into the dinner hour and
 6 folks don't get home from work.
 7 But our goal was to reach out and communicate
 8 with members of the community. And I would like to think
 9 that we accomplished that. We may not have been
 10 responsive to the way that all members of the community
 11 would want us to be responsive. But by us coming out
 12 here and speaking, we think we're doing an important
 13 activity that will give you information so that you'll
 14 leave tonight more informed than when you got here.
 15 I did want to make a couple of comments on the
 16 information that we provided to you earlier. There is a
 17 January 16th letter in that to Pacific Gas & Electric,
 18 that outlines -- we call it a "quick look letter."
 19 Essentially, it outlines our inspection activities
 20 through what Dave had described as Phase 1, which were
 21 the December activities, and Phase 2, which were the
 22 early January activities.
 23 We got that letter out early to PG&E, such that
 24 it could be put out into the public so you, the members
 25 of the community, would understand our inspection

1 activities that have taken place to date.
 2 The second document we have in there is a
 3 formal inspection report that formally outlines our
 4 inspection activities through the last calendar quarter
 5 of the year 2003. There are only excerpts in there from
 6 the cover letter and the findings, and the specifics of
 7 the inspection activities we did with respect to the
 8 earthquake. That inspection report, in its entirety,
 9 would have been about 50 pages. And we just -- we
 10 couldn't justify making that many copies and having to
 11 pack them out here. So what's called the session number
 12 or the number that you can go to the website and get the
 13 entire report, if you're interested, is clearly marked by
 14 hand on the front of that.
 15 I think I mentioned earlier that it's our
 16 intent that as we finish the Phase 3 of the inspection
 17 activities, those will be completed and documented in an
 18 inspection report that will cover the first quarter of
 19 calendar year of 2004, and will be issued the end of
 20 April. Following the issuance of that report, it's our
 21 intent to come back and visit with the community again,
 22 to provide you insights on our inspection activities that
 23 -- as we complete the inspections of the earthquake.
 24 I am getting tired, Pat. Do you have anything
 25 else?

1 REPORTER'S CERTIFICATE
 2
 3 ---
 4
 5 I, CAROLYNN ELAINE SPERE, A
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 14 OF MY SHORTHAND NOTES SO TAKEN.
 15 DATED AT SAN LUIS OBISPO, CALIFORNIA,
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 17
 18 _____
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 20 CERTIFIED SHORTHAND REPORTER
 21
 22
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 24
 25

1 MR. GWYNN: No, I don't.
 2 I do want to thank you all for bearing with us.
 3 We will make an effort to do a better job of letting you
 4 know in advance of our schedule for the next meeting.
 5 And we do plan to not only issue the transcript of this
 6 meeting, but also to perhaps provide some answers to some
 7 of the questions that we've heard tonight, as well, in a
 8 public way.
 9 And with that, we'll close this meeting. Thank
 10 you.
 11 MR. SATORIUS: One last thing. We will be
 12 sticking around, to the extent that there are further
 13 questions or dialogue you would like to have with us
 14 until the room empties out.
 15 (Hearing concluded at 11:11 p.m.)
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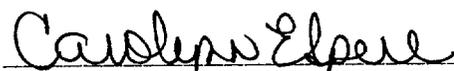
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I HEREBY CERTIFY THAT THE FOREGOING
PROCEEDING IS A FULL, TRUE AND CORRECT TRANSCRIPT
OF MY SHORTHAND NOTES SO TAKEN.

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THIS 23RD DAY OF FEBRUARY, 2004.


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