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**Community Engagement  
Panel Public Meeting  
Transcript of Proceedings**

**Date: 02/16/2017**

**Job #: 603727**

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SAN ONOFRE DECOMMISSIONING  
COMMUNITY ENGAGEMENT PANEL MEETING  
STATE OF CALIFORNIA, COUNTY OF ORANGE  
  
TRANSCRIPT OF VIDEOTAPED PROCEEDINGS  
DANA POINT, CALIFORNIA  
THURSDAY, FEBRUARY 16, 2017

Reported by:  
CARLOS R. HICHO  
CSR No. 13111  
Job No. 603727

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SAN ONOFRE DECOMMISSIONING  
COMMUNITY ENGAGEMENT PANEL MEETING  
STATE OF CALIFORNIA, COUNTY OF ORANGE

Transcript of videotaped proceedings, taken  
at 24200 Dana Point Harbor, Dana Point,  
California 92629, commencing at the hour of  
5:30 P.M., THURSDAY, FEBRUARY 16, 2017.

1 COMMUNITY ENGAGEMENT PANEL MEMBERS PRESENT:

2 DR. DAVID G. VICTOR  
3 CEP CHAIRMAN  
4 UNIVERSITY OF CALIFORNIA, SAN DIEGO

5 TIM BROWN  
6 CEP VICE CHAIRMAN  
7 SAN CLEMENTE MAYOR

8 DAN STETSON  
9 CEP SECRETARY  
10 OCEAN INSTITUTE

11 TOM PALMISANO  
12 VICE PRESIDENT, DECOMMISSION  
13 AND CHIEF NUCLEAR OFFICER AT SONGS  
14 (Not Present)

15 JIM MADIGAN  
16 DIRECTOR of NUCLEAR OVERSIGHT,  
17 SAFETY CULTURE AND REGULATORY AFFAIRS

18 TED QUINN  
19 AMERICAN NUCLEAR SOCIETY  
20 SAN DIEGO CHAPTER

21 DR. WILLIAM PARKER  
22 UNIVERSITY OF CALIFORNIA, IRVINE

23 GLENN PASCALL  
24 SIERRA CLUB

25 CARLOS OLVERA  
MAYOR OCEANSIDE

TOM CAUGHLAN  
CAMP PENDLETON

PAM PATTERSON  
OCEANSIDE  
MAYOR PRO TEM

25 (Continued.)

1 COMMUNITY ENGAGEMENT PANEL MEMBERS PRESENT:

2 GARRY BROWN  
ORANGE COUNTY COASTKEEPER

3 JIM LEACH  
4 CHAIRMAN  
SOUTH ORANGE COUNTY ECONOMIC COALITION

5 RICH HAYDON  
6 CALIFORNIA STATE PARKS

7 LISA BARTLETT  
ORANGE COUNTY SUPERINTENDENT  
8 5TH DISTRICT

9 GUEST SPEAKER PRESENT:

10 MATT MARSTON  
11 SENIOR VICE PRESIDENT,  
SONGS DECOMMISSIONING SOLUTIONS

12 DR. NEAL DRISCOLL  
13 NEW SCRIPPS SEISMIC RESEARCH

14

15 PUBLIC COMMENT PERIOD

16 PAGE LINE

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1 THURSDAY, FEBRUARY 16, 2017

2 DANA POINT, CALIFORNIA

3 5:36 P.M.

4 \* \* \*

5 CHAIRMAN DR. VICTOR: Let's begin.

6 Good evening to everyone. Thank you for all  
7 coming up here. And for those of you coming from  
8 San Diego County, thank you for braving the 5, which  
9 was kind of a nightmare this evening.

10 Why don't I just -- my name is David Victor  
11 and I'm Chairman of the Community Engagement Panel. We  
12 have a terrific and important topic to -- for  
13 discussion tonight around seismic and tsunami risks  
14 related to the site area.

15 I just want to remind everybody before we --  
16 we begin, should there be a reason to evacuate the  
17 room, you can come in either one of the doors that you  
18 came in through. That's, actually, the only official  
19 exit, I think, that's available to us, but that looks  
20 like a pretty effective exit over there as well  
21 (indicating), so either one of those -- those two  
22 doors.

23 We have two officers in attendance tonight  
24 from the Orange County Sheriffs Department. I want to  
25 thank you for your service and thank you for your help

1 in providing safety for -- for our meetings. We really  
2 very much appreciate it.

3 I just want to remind everybody: The  
4 Community Engagement Panel is not a decision-making  
5 body. It's not an oversight body. It's -- it was  
6 set up by Edison with volunteer members from the  
7 communities that are affected in various ways by the  
8 operation and decommissioning of the plant to open a  
9 conduit between the operators of the plant and the  
10 people affected by the decommissioning process and a  
11 two-way conduit at that, so that the operators can  
12 understand better what people in the communities are  
13 concerned about and people in the communities who are  
14 affected by this process and want to help share --  
15 steer and shape this process so that those folks can --  
16 can provide various kinds of input.

17 The site [www.SONGScommunity.com](http://www.SONGScommunity.com) has reminders,  
18 information, all official correspondence related to the  
19 CEP is up there. The draft slide deck that will be  
20 presented tonight was put -- put up there yesterday.

21 The technical papers that are the subject of  
22 tonight's meeting were put up there on Saturday and  
23 there's a section of the site that you can find from  
24 the home page that has the ongoing seismic work that's  
25 been there, essentially, from the beginning.

1           Tonight's meeting, like all meetings, is being  
2    livestreamed and archived on the site. Hard -- hard  
3    copies of tonight's agenda are on everyone's chair,  
4    along with hard-to-read slides.

5           If you want to sign up for a walking tour, a  
6    public walking tour, you can go to the site. The next  
7    walking tours are on March 8th and March 18th.

8           A reminder: That as you came in, there were  
9    various information booths; some of them maintained by  
10   Edison, some of them representing different folks from  
11   the community who wanted to share their information  
12   with the community.

13          Those booths are out there and they will be  
14   open during the -- during the break that we'll have in  
15   about an hour, an hour and a half.

16          If you want to make a comment during the  
17   one-hour public comment period, please sign up in  
18   the -- in the table that's outside. There's a sign-up  
19   list. Dan Stetson, Secretary, and Tim Brown,  
20   Vice Chairman of the CEP, will help monitor the public  
21   comment period, take notes on the various topics that  
22   come up and help me facilitate a dialogue, so we get as  
23   many answers tonight to the questions that are raised  
24   and we have a process in place so that if questions  
25   can't get fully answered tonight, we have -- we have a



1 way of getting answers to them and make those answers  
2 fully available to the public.

3 If you don't want to stand up here and make a  
4 comment but you want to say something, you can send it  
5 to that email address -- it's up on the screen --  
6 nuccomm@songs.sce.com.

7 It doesn't exactly roll off your tongue but  
8 it, nonetheless, works -- and your comments will be  
9 made part of the official record and any comments  
10 received within five business days at the end of the  
11 meeting will be part of the official record and we'll  
12 also make sure that the topics raised in those comments  
13 get -- get answers.

14 I want to introduce two new members to the  
15 Community Engagement Panel: Martha McNicholas,  
16 President of the Board of Trustees from Capistrano  
17 Unified School District, right over here, to my right,  
18 to your left; and Paul Wyatt is sitting right over  
19 here, Mayor Pro Tem from Dana Point.

20 And I want to thank Paul, not -- not only for  
21 joining us, but also to the people of Dana Point for  
22 hosting us tonight. And Dan Stetson, a former head of  
23 the Oceanside Institute, I want to thank your former  
24 colleagues for welcoming us so ably here.

25 I also want to introduce two guests that we

1 have tonight: Matt Marston is Senior Vice President,  
2 representing the SONGS decommissioning solutions, and  
3 Tom Palmisano will tell -- tell us more about the  
4 decommissioning contractor selected, and Mr. Marston's  
5 company and then the processes that they will be  
6 undertaking as the decommissioning process continues.

7 And I also want to welcome Neal Driscoll,  
8 Dr. Neal Driscoll, from the Scripps Institution of  
9 Oceanography, who you'll hear more from later as -- as  
10 we learn about the work that he and his colleagues have  
11 been doing for Edison and published in the academic  
12 literature around the seismic and tsunamic risks.

13 Just a reminder to the Panel members: Please  
14 state your name for -- as you're making comments so  
15 that people at home and around the world, other  
16 planets, maybe, as they're watching, they know who's  
17 saying what and also that's part of the -- part of the  
18 official record.

19 I'm going to call out various items as they  
20 come up to make sure that they're also captured in the  
21 public record, and we've been keeping fairly good  
22 records about topics that come up and how they're being  
23 resolved and so on.

24 Tonight's topic is the New Scripps Seismic  
25 Research and introduction to the decommissioning

1 general contractor.

2 We'll get to -- to all of that. But first, as  
3 is our custom, I give the floor to Tom Palmisano,  
4 Vice President for Decommissioning and the Chief  
5 Nuclear Officer for -- for Edison to give us an update  
6 on the decommissioning process.

7 Tom, the floor is yours.

8 MR. PALMISANO: Okay. Thank -- thank you very  
9 much. I know the room is a little smaller than usual,  
10 so I'll just stand to the side here so I don't obstruct  
11 anybody's view.

12 Thank you for coming to our Community  
13 Engagement Panel tonight. We're looking forward to a  
14 good discussion. I've shortened my normal  
15 decommissioning update to allow more time for the  
16 seismic discussion, so there's some very important  
17 information that Dr. Driscoll is going to discuss and I  
18 wanted to make sure we had adequate time.

19 So I'm going to touch on the decommissioning  
20 update lightly. Next meeting we'll be back to the  
21 normal update with a bit more detail.

22 All right. As always, our decommissioning  
23 principles of Safety, Stewardship, and Engagement.  
24 Again, go to [SONGScommunity.com](http://SONGScommunity.com), and we hold these in  
25 front of us every time we meet as well as we use these

1 daily onsite.

2 Brief update on NRC activities recently:  
3 Couple of license amendment requests have been  
4 submitted since the last meeting and the top one has  
5 been approved.

6 So at the very top: The NRC has a cyber  
7 security program, which we were complying with and  
8 implementing Milestone as an operating plant and we've  
9 continued that because we're still under, basically,  
10 operating plant regulations to some degree.

11 So the NRC has realized, for decommissioning  
12 plants where virtually all of the equipment is retired  
13 now, with a very small exception, they can extend the  
14 deadline for us. We submitted a request and the final  
15 Milestone we need to comply with by the end of 2019.

16 What's important there is, we expect to have  
17 the spent fuel out of the spent fuel pools before that,  
18 so that's why they moved the Milestone out to allow us  
19 to complete that activity.

20 We are fully compliant with today's NRC  
21 requirements for cyber security and they are satisfied  
22 with where we are. The two insurance exemption  
23 requests I talked about before, these are insurance  
24 that's really applicable to operating plants. They are  
25 not really applicable, but I can't change those

1 unilaterally, so they need NRC action.

2 We submitted those in September -- in October  
3 of 2015 and I would expect the NRC will complete their  
4 approvals in the second quarter of 2017, and a recent  
5 submittal since the last meeting is the last one.

6 Some of you who were involved with this in  
7 2014 and 2015 probably remember the first change to the  
8 emergency plan when the fuel had decayed long enough  
9 that we didn't need the full operating plant emergency  
10 plan requirements.

11 We still have an NRC-approved emergency plan.  
12 It is an emergency plan that provides onsite activities  
13 and support, aligns with off-site authorities to  
14 protect the public health and safety that is in place  
15 today. And it's -- it's built around activities that  
16 could -- or incidents that could occur in the spent  
17 fuel pools or dry cask storage.

18 This round of submittals is looking ahead a  
19 year and a half to what spent fuel pools are emptied  
20 and it formulates the emergency plan around the dry  
21 cask storage system.

22 So this needs NRC approval. We submitted this  
23 in December of 2016. It has now been published in the  
24 Federal Register and it is open for public comment so  
25 you can see the Submittals in the Federal Register.

1           So, as we did --

2           MR. QUINN: Ted -- Ted Quinn. I wanted to  
3 ask, does this take the place of the current tech  
4 specs?

5           MR. PALMISANO: Yeah. Good question.

6           And there's actually three pieces to this.  
7 And my abbreviation is probably short. Technical  
8 specifications are an attachment to the license that we  
9 hold that provide the rules by which the plant  
10 equipment is maintained and that has been changed once  
11 to reflect the decommissioning state. This would  
12 change it again once everything is in dry cask storage.

13           The other change is the Emergency Plan, the  
14 other change is the Security Plan, to focus it on the  
15 dry cask storage facility. Now it's broader than that.

16           Now, what we'll do in future meetings --  
17 again, this takes about 18 months to get approved, so  
18 there's lots of opportunity for public comment.

19           As we did in 2014 and 2015 in this forum, we  
20 will discuss this in more detail. So tonight I'm just  
21 giving you a status because, again, I want to allow  
22 adequate time for Dr. Driscoll's presentation.

23           All right. NRC inspections: The NRC inspects  
24 us regularly. They have a decommissioning inspection  
25 program. We've completed the first quarter inspection.

1 You can see second and third quarter inspections coming  
2 up. They will inspect security. And they also are  
3 inspecting the construction of the dry cask storage  
4 system, the ISFSI, the Independent Spent Fuel Storage  
5 Installation.

6 So they inspect that as we continue  
7 construction, so they do that periodically based on  
8 activities. The NRC is actually planning on joining us  
9 for the second quarter CEP meeting to talk about their  
10 programmatic oversight and their inspection oversight.  
11 So, again, I think that'll be a worthwhile discussion  
12 for them to come out and talk about their activities.

13 Quick -- that's a quick picture of the NRC  
14 activities in terms of site activities. I really want  
15 to focus on the construction of the ISFSI as we talk.

16 We are constructing the expander, the new dry  
17 fuel storage installation in this area here. This is  
18 the existing dry fuel storage installation. Units 2  
19 and 3 will be to the lower right off the picture and  
20 this is the area that's under construction for the new  
21 dry cask storage system.

22 I don't have my schedule information on this  
23 slide. But, basically, I expect to finish construction  
24 towards the fourth quarter of 2017 and then follow that  
25 by the spent fuel offload in 2018, completing by

1 mid-2019. Again, that's the schedule information we  
2 talked about before. And in a future meeting, when we  
3 have more time, we'll provide more status on that.

4 One thing that is active is the California  
5 Environmental Quality Act Update. If you remember a  
6 couple of meetings ago, a representative of the State  
7 Lands Commission came in and talked to us about the  
8 California Environmental Quality Act Process and the  
9 State Lands Commission Process, in particular.

10 That process is currently active. We had  
11 scoping meetings last fall in the local area. There  
12 were a couple of meetings in and around the vicinity of  
13 the site.

14 Currently, the State Lands Commission is  
15 preparing a Draft Environmental Impact Report and what  
16 they tell us -- and these are their dates, not our  
17 dates -- they tell us to expect second or third quarter  
18 of 2017, they will issue the Draft Environmental Impact  
19 Report for public comment, and they hold meetings  
20 associated with that.

21 So those are important activities coming up  
22 that we want to make sure the public is aware of and  
23 look for those opportunities. We will certainly  
24 communicate them once the State Lands Commission  
25 establishes those dates.



1           CHAIRMAN DR. VICTOR: Let me just interrupt  
2 for just a moment. We have asked the Commission to  
3 make sure that they hold some of their meetings here.

4           MR. PALMISANO: Yes.

5           CHAIRMAN DR. VICTOR: And that seems entirely  
6 logical that they'll do that. But, certainly, we've  
7 offered that if it looks like their public engagement  
8 process is not adequately engaging the public, we  
9 should have a CEP meeting around this -- this topic was  
10 and to see how that goes.

11          MR. PALMISANO: And I -- I would certainly  
12 expect, once the draft is out, it would be an  
13 appropriate time for us to come in and talk about where  
14 we are in the process and what the draft contains.

15                 Again, these are important activities for the  
16 public and we want to make sure that you're well aware  
17 of these opportunities to comment in the environmental  
18 review process.

19                 With that -- it's a brief update on plant  
20 activities or site activities. Again, in the interest  
21 of time, I'm not going to give a lengthier update  
22 tonight. Certainly, if David -- if the Panel has any  
23 questions, I'll be glad to entertain it.

24          CHAIRMAN DR. VICTOR: Can -- can you just say  
25 a word about whether everything is, more or less, on

1 the schedule that you've outlined? I've heard -- I've  
2 seen some news reports that the construction of the  
3 ISFSI has been delayed, the pad on which these  
4 canisters where -- that hold the spent fuel will be  
5 stored.

6 Are those reports accurate? Is, in fact,  
7 scheduled -- the whole process on schedule off-loading  
8 completed by 2019? Help us understand.

9 MR. PALMISANO: Yeah, when it comes to  
10 constructing the dry fuel storage installation, or the  
11 ISFSI, and off-loading the fuel pools, our target date  
12 is mid-2019. We are on schedule for that.

13 We're actually -- again, for those of you who  
14 work construction schedules or project schedules,  
15 schedules change week to week. We're actually showing  
16 completing a little earlier than that.

17 So we had a bit of a slow start, you know,  
18 just due to the timing of the Coastal Development  
19 Permit. Once that was issued, the contractor ramped up  
20 effectively and they're now on schedule and actually  
21 starting to gain on the schedule.

22 So, big picture: If you look at our  
23 decommissioning cost estimate and our filings in the  
24 Post-Shutdown Decommissioning Activity Report, we  
25 forecast mid-2019. We're slightly ahead of that right

1 now.

2 CHAIRMAN DR. VICTOR: Any other questions for  
3 Tom about the general decommissioning process and  
4 schedule? Okay. Thank you very much, Tom.

5 MR. PALMISANO: Okay. So I think I'm up next  
6 with the decommissioning general contractor selection.

7 So with that, we're pleased tonight to bring  
8 in Matt Marston, who is the Executive Sponsor of our  
9 decommissioning general contractor.

10 If you remember, over the last two years when  
11 I showed you that time line that David talks about  
12 being an eye test for us to look at, I've shown a long  
13 bar to -- to first select the decommissioning general  
14 contractor, and then a period of time, on the order of  
15 eight to ten years, for decommissioning general  
16 contractor to actually perform the physical work of  
17 decommissioning and removing the plant.

18 So, as part of that, we decided to go for a  
19 bid for that for -- about three years ago. As part of  
20 that, we've benchmarked virtually every commercial  
21 decommissioning to date for commercial nuclear plants  
22 in the country.

23 We visited several sites that are either in  
24 the middle of decommissioning or were entering  
25 decommissioning, and we took all the lessons we could

1 learn from past -- the past.

2 We wrote an extensive specification and we  
3 went out for a competitive bid, and we spent almost a  
4 year in the competitive bid process because we wanted  
5 to pick a very competent, a very qualified contractor.  
6 And there were several good companies who bid on this.  
7 So we took our time and did not feel this needed to be  
8 rushed.

9 So we're pleased tonight to introduce SONGS  
10 Decommissioning Solutions. So I'm going to turn it  
11 over to Matt in a minute. This is a joint venture of  
12 AECOM, a large architect engineer construction company  
13 based in Los Angeles, and Energy Solutions.

14 And with that, let me turn it over to Matt at  
15 this point to introduce SONGS Decommissioning  
16 Solutions.

17 I will tell you, they are just mobilizing.  
18 They don't have a plan in place yet, so we're not here  
19 to say "In 2019 -- in May of 2019, we're going to be  
20 doing this" and "June of 2020, we're going to be doing  
21 that." It takes about a year for that planning to  
22 occur.

23 So with that, Matt, let me turn it over to  
24 you.

25 MR. MARSTON: Thanks, Tom. Thank you very

1 much. Everybody hear me okay? I'll take that as a  
2 "yes." I'm very pleased to be here.

3 Thank you very much for the opportunity, Tom  
4 and Panel. Great to introduce my team. I'm proud to  
5 represent a really, really strong decommissioning team,  
6 and I hope to give you a general overview of what that  
7 looks like.

8 We're certainly committed to the core values  
9 that Tom talked about: Safety, Stewardship, and  
10 Engagement. One of the things that was obvious to us  
11 as we went through the process, there was a very close  
12 alignment between the way we do business and those core  
13 principles.

14 And I believe, from my perspective, at least,  
15 that's one of the reasons why we were selected as the  
16 contractor.

17 As Tom indicated, it's the -- it's the  
18 collaboration between AECOM and Energy Solutions.  
19 AECOM is an international architect engineering  
20 company:

21 About 87,000 people worldwide, in 150  
22 countries, a very large company with a tremendous  
23 breadth of experience and capabilities.

24 We're rated at the top of the industry in  
25 environmental and program management, and those --

1 those are the major capabilities we bring along with  
2 Energy Solutions. I'll talk a little bit more about  
3 Energy Solutions capabilities.

4 Past performance perspective: We do a  
5 tremendous amount of work in the commercial nuclear  
6 industry, big into large component replacements and  
7 cleanup at a variety of commercial and government  
8 sites -- very, very deep experience and knowledge --  
9 did steam generator replacements at Diablo Canyon, as a  
10 local example.

11 One other feature of our company is our  
12 environmental organization based in San Diego has also  
13 provided a significant amount of environmental --  
14 California environmental support for SONGS and  
15 California companies across the State.

16 Energy Solutions is the largest U.S. company  
17 in nuclear waste, extensive experience and capabilities  
18 and resources. They're a privately held company. They  
19 have privately-held transportation assets that are  
20 significant support commercial nuclear and all nuclear  
21 operations across the country. They also own their own  
22 landfill facilities and those are at our access. We  
23 have access to all of those resources.

24 From a broader perspective though, Energy  
25 Solutions is also an NRC license holder at two stations

1 in the Midwest: Zion in Illinois and La Crosse in  
2 Wisconsin. So they have an increment knowledge with  
3 respect to what Tom has to enforce as it relates to his  
4 license, and that gives us some insight as to what the  
5 utility is looking for and gives us some alignment in  
6 our ability to deliver that for the site.

7 From a past performance perspective, we were  
8 involved in the decommissioning cost estimate for this  
9 site and many others. And at the Zion station, it is  
10 very comparable from size and scope. It's a two-unit  
11 pressurized water reactor, just like San Onofre is.  
12 And that project is well advanced into the demolition  
13 phase and we're on schedule and ahead of the budget.

14 But, fundamentally, I think what we bring is  
15 predictability based on our experience -- from a safety  
16 perspective, that's first and foremost, in our opinion,  
17 and in the Station's opinion -- regulatory compliance,  
18 environmental compliance, cost and schedule.

19 Because we've been there and done that, we can  
20 predict pretty accurately where we'll be and how much  
21 it'll cost and do it safely in an accordance with the  
22 regulations.

23 My team: As I indicated, I'm really proud and  
24 honored to represent this team. Many of these team  
25 members I've worked with for decades. We bring to the

1 table over 350 years just in my senior leadership team  
2 of nuclear experience and 250 of that is in nuclear  
3 D&D. So we know nuclear D&D. This is what we do every  
4 day and have done for sometime. Very proud of my team  
5 and happy to represent them.

6 Beyond our onsite leadership team, we also  
7 have a very experienced executive leadership team on  
8 our management board that supports us and they provide  
9 us with access back to our corporate members for  
10 support in the event that we need it onsite.

11 As Tom indicated, this is a long project,  
12 relatively speaking, 8 to 10 years. And this first  
13 year, 2017, is all about planning the work. We want to  
14 make sure we have a solid plan. And plan the work,  
15 work the plan is really a mantra that we live by.

16 So this first year is really important for us  
17 to get that straight and get that right. And this is  
18 the period of time, as Tom mentioned, as the CEQA  
19 process goes through, that allows us to get this  
20 planning in place so that when the permits are issued  
21 and the Utility gives us the approval to proceed, we  
22 can start work and have a solid plan to work through  
23 that time frame. So the first year is all planning.

24 I know one of the things that's of importance  
25 to the local community is jobs. We are bringing jobs



1 to the local community and I'll just touch on that  
2 briefly. So our overall plan involves several hundred,  
3 three- to 400 people.

4           Within that three- to 400 people, a good  
5 percentage are local resources, specifically with  
6 respect to all the craft resources that support the  
7 job. This is a union job, general project --  
8 president's project maintenance agreement job, all of  
9 those union resources will come from the local  
10 community. That's in the 200 to 250 people range.

11           With respect to oversight and staff,  
12 management staff, certainly we bring capabilities and  
13 experience from outside the community because that's  
14 what we do. But with respect to the staff, we forecast  
15 that about half of our staff of 150 will be from the  
16 local community.

17           So that gives you a perspective that, overall,  
18 three quarters of the staff and labor force will be  
19 from the local community.

20           And we'll talk more about the scope and how we  
21 plan to execute the job at another opportunity, but I  
22 just want to thank you again for the opportunity to  
23 introduce our companies and I look forward to working  
24 with both the Panel and the community and with the  
25 Utility as we go forward as the decommission is

1 planned.

2 CHAIRMAN DR. VICTOR: Okay. Great. Thank you  
3 very much, Matt. And I just -- thank you for being  
4 here tonight. We wanted this to be an informational  
5 item. I know Tim, Dan and I have received many  
6 inquiries from members of the public as the contractor  
7 process was going on about, you know, who is this  
8 entity? And what are you doing? And how many arms do  
9 you have? Things like that.

10 MR. MARSTON: Two.

11 CHAIRMAN DR. VICTOR: And, in particular,  
12 we've had a lot of questions about jobs and about  
13 organized labor and so on, and please -- at some point  
14 over the next year or so, we're going to organize a  
15 meeting of this panel around the -- the broader  
16 decommissioning process. And please do come back and  
17 let's talk about these issues in greater depth and I  
18 look forward to that.

19 So, thank you very much.

20 MR. MARSTON: Thank you.

21 CHAIRMAN DR. VICTOR: Please, Glenn Pascall.

22 MR. PASCALL: I hope this isn't a premature  
23 question. With your experience in D&D, when you get to  
24 the point where you are carving up the reactor shell  
25 and all of the spent fuel has been stored, how do you

1 dispose of it? What is your -- your procedure for  
2 doing that? Or is it too early to tell exactly where  
3 it might go at San Onofre?

4 MR. MARSTON: Well, certainly, there's  
5 precedent in the industry on how this is done; in some  
6 cases is done in whole, in some cases in pieces. But  
7 that's part of what we're doing over the next year, is  
8 finalizing how we plan to do it here at the site. And  
9 I plan to cover that at the next opportunity. Thank  
10 you.

11 CHAIRMAN DR. VICTOR: Let me know suggest that  
12 we -- and I'll say more about this in a little bit --  
13 let's begin a process in the CEP of organizing  
14 questions that we think would be very important. This  
15 certainly should be on the list. And I know --

16 MR. MARSTON: Right.

17 CHAIRMAN DR. VICTOR: -- the questions we've  
18 received from organized labor should be on the list.

19 MR. MARSTON: Yes.

20 CHAIRMAN DR. VICTOR: And we'll make sure we  
21 organize that. That way, when we come back and talk  
22 about this, we can be as focused as possible on what  
23 the folks care about. Okay.

24 MR. MARSTON: Thank you.

25 CHAIRMAN DR. VICTOR: Thank you very much.

1 I'm going to give the floor back to you, Tom,  
2 to -- to introduce Neal Driscoll and the seismic study,  
3 and then I want to say a couple of words about the --  
4 just technical discussion tonight. Tom?

5 MR. PALMISANO: Okay. Thank -- thank you very  
6 much. And, again, Matt, thank you for coming tonight.  
7 You will see Matt and other members of his team as  
8 regular attendees, making presentations, answering  
9 questions, as Dr. Victor has pointed out. So we know  
10 it's an important topic. So, thank you for joining us.  
11 I appreciate that.

12 MR. MARSTON: Thank you.

13 MR. PALMISANO: What I want to do now is  
14 introduce the -- the topic of the recent seismic  
15 studies related to San Onofre. And I certainly won't  
16 profess to be a seismic expert; that's certainly  
17 Dr. Driscoll's role.

18 But I would like to do is -- is start with an  
19 overview: What we want to do tonight is kind of give  
20 you an update on -- as the research that's been going  
21 on for the last four to five to six years comes to a  
22 conclusion. It's at the point where Dr. Driscoll and  
23 his team are ready to start reporting out their  
24 conclusions as they finalize some of their reports.

25 And this is -- this is an important topic to

1 the community. It's an opportunity topic to Southern  
2 California Edison. And we thought this was an  
3 appropriate topic for this venue.

4           What I'm going to do very quickly is just  
5 summarize the original seismic design basis and also  
6 bring you forward with some things that have changed in  
7 our seismic design basis over the years and then turn  
8 it over to Dr. Driscoll to really pick up, and that's  
9 the bulk of the presentation, and then I'll have a few  
10 comments at the end.

11           So, very quickly, the research we're talking  
12 about tonight was -- was actually directed by the  
13 California Energy Commission. Okay. And this was  
14 codified in Assembly Bill 1632. So this directed both  
15 Southern California Edison and Pacific Gas & Electric  
16 for San Onofre and Diablo Canyon respectively to do  
17 some seismic research based on some new information  
18 that may come to play with respect to potential seismic  
19 effects on the plant. So that was the genesis of this  
20 research that we're going to be listening to tonight.

21           The Bill and California Energy Commission  
22 requested evaluation of some relevant seismic data, and  
23 we were directed to conduct this research and that was  
24 done under the authorization, also, of the Public  
25 Utility Commission.

1           To take you back to the beginning though, you  
2 know, the San Onofre 2 and 3, when they were designed  
3 and built, with any commercial nuclear plant in this  
4 country, you have to do some extensive geological and  
5 seismic studies at the time that you request your  
6 license and construction permit.

7           Back at that time -- and this is, again, back  
8 in the day -- earthquakes having a Richter magnitude  
9 greater than 5.0 within 200 miles had to be included in  
10 the evaluation to determine the most likely earthquake  
11 hazard, if you will, for the site, for the nuclear  
12 plant that at the time was being designed and built.

13           What came out of that study, again, back in  
14 the days of the design and licensing of San Onofre, was  
15 the largest magnitude earthquake at that point in time  
16 was -- anticipate be a 7.0 quake on the Newport  
17 Inglewood/Rose Canyon Fault, and you're going to hear a  
18 lot more about that fault system in a minute.

19           Now, that translates -- let's clear up Richter  
20 scale versus peak ground acceleration: So Richter  
21 scale, very simply -- if you remember what Dr. Parker  
22 did about two years ago in educating us -- is basically  
23 a measure of the energy at the epicenter of the  
24 earthquake.

25           So I can look at San Andreas, so I can look at

1 Newport Inglewood/Rose Canyon and say it's a magnitude  
2 7.0 at Newport Inglewood/Rose Canyon. That fault is  
3 about 5 to 6 miles from the site, if I remember  
4 correctly.

5 DR. DRISCOLL: Seven.

6 MR. PALMISANO: Seven. 7 miles. Thank you.  
7 It's about 7 miles from the site.

8 PUBLIC MEMBER: Oh, miles? You're right,  
9 miles. Kilometers I'm talking about.

10 MR. PALMISANO: Kilometers. Okay. So roughly  
11 5 miles or so, 7 kilometers.

12 CHAIRMAN DR. VICTOR: How many inches?

13 MR. PALMISANO: English -- English metric  
14 here. Thank God we don't work for NASA. Right?

15 So -- anyway, so that's a certain distance  
16 from the site. So I've got this magnitude of energy a  
17 certain distance from the site. But when I design a  
18 building, what matters is what does the site feel,  
19 what's the movement or the shaking, horizontal or  
20 vertical movement at the site.

21 So I've got to take that 7.0 on the Richter  
22 scale and translate it to what is exciting or moving  
23 and shaking the buildings and structures. So that's  
24 where peak ground acceleration comes in.

25 So there's a way, analytically, you take 7.0

1 5 to 6 miles from the site and translate into what is  
2 felt in the ground where you're going to build the  
3 plant.

4 That's what -- and we've always used peak  
5 ground acceleration in our design calcs. It's just not  
6 something that's discussed publicly because, as a  
7 public, we hear about Richter scale about the intensity  
8 of an earthquake. So we've always, in fact, used both.  
9 Okay.

10 So the plant -- at the time that estimated  
11 very conservatively be a .63 peak ground acceleration.  
12 And I say conservative because there's a spectrum of  
13 calculations. So, to be on the conservative side, you  
14 take the higher end of that. Then they add additional  
15 conservatism. We said, "Okay, .67g was what the NRC  
16 initially approved."

17 So, what SONGS was originally designed for was  
18 a .67g ground motion acceleration based on that fault  
19 5 to 6 miles from the site with a magnitude of 7.0.  
20 That was the original basis.

21 So, over the years, a lot has occurred. Every  
22 nuclear plant in the country has continued to update  
23 the seismic study, partly, the science has gotten  
24 better, the tools have gotten better compared to the  
25 late 60s or 70s when these plants were designed and



1 licensed, compared to what we could do two or three  
2 decades later.

3           So this is not a summary of the entire  
4 history, just some of the major points. So, and around  
5 2000, it was postulated that there's an open Oceanside  
6 Blind Thrust Fault near and beneath San Onofre that  
7 could actually be potentially more severe than a 7.0 on  
8 the Newport Inglewood/Rose Canyon Fault.

9           Around the same time, we were permitting the  
10 original dry cask storage system. And to account for  
11 that potential of a postulated fault, we actually  
12 significantly increased the design requirements for the  
13 dry cask storage system. So the existing system and  
14 the new system are designed for 1.5g peak ground  
15 acceleration, you know, virtually more than double what  
16 the plant was built for and that's an important point.

17           2001, we were doing some studies of this  
18 potential fault because the NRC certainly expects us to  
19 stay abreast of new research. Okay. We determined  
20 that our seismic risk did not appreciatively change,  
21 partly because the design was so conservative and so  
22 robust, even a .67g, the structures are built actually  
23 much -- to withstand significant force and have a lot  
24 of margin above the .67g.

25           That allowed us, after appropriate engineering

1 studies, to conclude that and the NRC agreed with that  
2 conclusion. In 2010, as we continued to do work, we  
3 upgraded the potential magnitude on the Newport  
4 Inglewood/Rose Canyon fault to 7.5. Okay.

5 You know, looking at the contribution of the  
6 Oceanside Blind Thrust and say, "Okay. Let's just bump  
7 it to 7.5." We then re-reviewed the plant and found  
8 that we had adequate margin to even a 7.5 magnitude.

9 Again, the plant was designed and built so  
10 robustly back then, it had plenty of margin to  
11 accommodate the 7.5 earthquake. That brings you up to  
12 2010.

13 So with that -- I'm going to turn it over to  
14 Dr. Driscoll in a minute. So, really, then starting  
15 with the direction from the California Energy  
16 Commission to -- to more thoroughly evaluate the  
17 seismic risk, kicked off the Scripps studies.

18 Again, our -- our dry fuel storage system  
19 seismic criteria is the highest in the country, and I  
20 can tell you that factually, and then the more recent  
21 hazard analysis that Dr. Driscoll is going to -- it  
22 shows that there's no appreciable increase in risk  
23 based on research that Scripps has concluded. It takes  
24 us back to where our 2010 conclusion was.

25 So, with that, Dr. Driscoll.

1           CHAIRMAN DR. VICTOR: Let me just, as Neal is  
2 coming up, I just want to say three things to help us  
3 orient ourselves around this -- this is -- there's  
4 going to be a lot of technical information here and  
5 this is just intrinsic to the topic:

6           I want to first just explain that, if we have  
7 questions that are about the seismic risk and the  
8 tsunamic risks and analysis around that, we're going to  
9 put those questions to Neal Driscoll.

10           If we have questions about how that affects  
11 the plant and the design of the plant, we're going to  
12 put those to Tom. But I just want to make sure it's  
13 clear why we're doing this because they're different  
14 responsibilities.

15           The second thing is, it's very clear from this  
16 technically complex topics where there's a lot of  
17 information, it's hard to figure out kind of what's  
18 right, what's wrong in some of what the experts think.  
19 It's very clear that people have a lot of questions,  
20 and so we're going to ask questions and answer -- get  
21 questions answered tonight.

22           I've also spent some time with Gary Headrick  
23 and asked Garry to help us panel the community and  
24 consult with the community to get a list of questions  
25 organized by different groups, whether it's the seismic

1 risk and tsunami risk, or whether it's for the plant or  
2 whether it's for the general contractor, and I saw a  
3 draft of those yesterday and I want to thank Garry for  
4 his help in putting -- putting that together and the  
5 ongoing process.

6 And so if you see other questions you want to  
7 have asked and answered in future meetings and with  
8 Dr. Driscoll offline, we're going to help organize  
9 this, so that this can be as informative as possible.

10 And a link to that draft is in the materials  
11 that we sent to the CEP this afternoon and -- and I  
12 know Garry will share more of that with us -- with us  
13 tonight.

14 And the last thing I wanted to say, and then  
15 I'll turn the floor over to Tom Caughlan for a  
16 question, is I want to just underscore that I've been a  
17 stickler about making sure that nothing we talk about  
18 here as tech -- assessed, scientifically-assessed,  
19 technical analysis has not been through peer review.

20 And so, you know, we'll say more about the  
21 exact papers. We've circulated two of the three  
22 papers, technical papers, that have been through peer  
23 review at top journals in the field, to the CEP, the  
24 last paper is formally accepted and, I think, within  
25 the next 24 hours will be released in its galley form.

1           And the reason that I've done that is because,  
2 you know, whether it's global warming, which is what I  
3 do a lot of work on in my day job, or it's seismic  
4 risk, the technical details really matter.

5           And there's no other way in the academic  
6 scientific literature to know what's right, what's  
7 wrong, what's been vetted, and what's not vetted, other  
8 than imposing peer review. And the gold standard for  
9 peer review, as a professional scientist, are the  
10 leading journals in the field.

11           And so I've been -- as we put this meeting  
12 together, been pretty aggressive, maybe -- apologies  
13 for being too aggressive about this, Neal, but I've  
14 been very aggressive about making sure that whatever is  
15 presented as the analysis has gone through that formal  
16 peer review process. Tom Caughlan.

17           MR. CAUGHLAN: Yeah, most of us don't have the  
18 thing in our head about what 7.5 means. Could you  
19 compare that to maybe the Northridge quake or the  
20 legendary San Francisco quake so we have some notion of  
21 comparison?

22           DR. DRISCOLL: Okay. So --

23           CHAIRMAN DR. VICTOR: Neal, welcome.

24           DR. DRISCOLL: Thank you. Let me first thank  
25 the Panel for affording us an opportunity to report on

1 our offshore work.

2 So, here when we look at some of the  
3 earthquakes, like the Northridge, 6.4, okay, that was a  
4 different style of fault system, it was a thrust fault,  
5 or the 1989 Loma Prieta -- all right? -- that was also  
6 a little lower.

7 But the three largest earthquakes in  
8 California are the 1906 in San Francisco, the  
9 Fort Tejon in 1857, and that's -- these two are on  
10 segments of the San Andreas, and then you have the  
11 Lone Pine earthquake in 1872. And these earthquakes  
12 are all close to 8.

13 So, the Richter scale, one thing to know about  
14 the Richter scale is, every increase in one is a  
15 tenfold increase in the amplitude of the earthquake  
16 from which you can then derive energy. So, hopefully,  
17 that kind of places this kind of number in some  
18 context.

19 MR. CAUGHLAN: Thanks.

20 DR. DRISCOLL: So here, before I start -- and  
21 I'm going to wander a little bit because I don't think  
22 I'll block the screen -- I'd like to introduce my  
23 colleague, Graham Kent, Professor Graham Kent,  
24 co-investigator in this project, and Graham is the  
25 Seismologist for the State of Nevada. He is also the

1 Director of the Seismological Lab at the University of  
2 Nevada, Reno, and he used to be here at Scripps before  
3 they stole him away. Okay.

4 We have also assembled a world-class team of  
5 experts that look at earthquakes, earthquake recurrence  
6 intervals, ground motion, and this team is second to  
7 none. I'm really proud to be standing here, reporting  
8 on some of the results of this team.

9 Some of the students are graduate students  
10 that have gone through the process with Graham and I,  
11 are post-docs, occupying United States geological  
12 survey, San Diego State University, California State  
13 University of Long Beach. Look at these names.  
14 Remember these names. These are the scientists of the  
15 future.

16 We also have people, like professor Steve  
17 Wesnousky, who has, like, 35-40 years of experience in  
18 looking at earthquakes and looking at properties of  
19 segmentation, Dr. Alistair Harding, one of the world's  
20 leading seismologists. Okay. So this team is one of  
21 the best teams in the world to address these problems.

22 Okay. So this talk is going to cover three  
23 subject matters. Today is going to be like drinking  
24 from a fire hose. There's going to be a lot of  
25 information, and we'll have follow ups. So this isn't

1 going to be just this one time off. And as David  
2 pointed out, we'll try to set up venues so that  
3 questions can be answered properly.

4 So here the first part is, I'm going to -- I'm  
5 glad this one has a button -- I'm going to be assessing  
6 alternative models for the offshore deformation.

7 There's two end-member models that explain the  
8 deformation that we observe offshore: This  
9 hypothesized Oceanside Blind Thrust and the Newport  
10 Inglewood/Rose Canyon Fault. So we're going to discuss  
11 how we tested between these and what is the preferred  
12 interpretation of our group.

13 Second, we're going to characterize the  
14 architecture of the Newport Inglewood/Rose Canyon Fault  
15 system. We're going to look at the segments and the  
16 stepovers that offset these segments and the  
17 implications.

18 And, finally, we'll discuss some near- and  
19 far-field tsunami hazards for the region here in  
20 Southern California. So, Tom pointed out earthquake,  
21 Richter scale, measurement of amplitude of the  
22 earthquake versus ground motion.

23 So the ground motion for a given amplitude  
24 earthquake is dependent on the distance between the  
25 site location you're interested in and the epicenter,



1 the projection of the earthquake to the surface.

2 It's also dictated by the characteristics or  
3 properties of the rocks that can attenuate that energy  
4 as the energy radiates out from the epicenter.

5 And about five-six years ago, in a  
6 super-computer, we also learnt that propagation  
7 direction of these earthquakes is really important. So  
8 if it propagates from south to north, it gives a  
9 different ground motion pattern than if it propagates  
10 from north to south.

11 So, here we have these faults outlined in  
12 orange. The orange fault is the San Andreas Fault here  
13 to the east, San Jacinto/Elsinore. These faults are  
14 too far away to create large ground motion at the plant  
15 and we've done numerous calculations. This has been  
16 reported in a number of reports by Edison, and we can  
17 speak to this further if people would like to.

18 So here the San Andreas is about 56 miles  
19 away, San Clemente Fault offshore is about the same  
20 distance, Coronado Bank, San Diego Trough Fault is a  
21 little closer. But, again, too far away to cause  
22 significant peak ground accelerations at the plant.

23 The two faults that are seismic sources at the  
24 plant are the Rose Canyon/Newport Inglewood Fault,  
25 shown here in red, so this red fault right here, and

1 Oceanside Line Thrust, which is this yellow. The  
2 reason the Newport Inglewood is aligned or series of  
3 lines is these strike-slip faults are steep. They're  
4 70 degrees or more. Okay.

5 Well, the Newport Inglewood Fault has a gentle  
6 angle, a sloping angle, about a green on the ski area,  
7 about 23 degrees. Okay. So this pattern is seen as a  
8 rectangle is because of its geometry. It's shallow in  
9 the west and deeper in the east. And you'll see that  
10 this fault goes right underneath the coastline, from  
11 Dana Point, a little farther north, all the way down to  
12 the border, about 100 kilometers long by about 30  
13 kilometers wide. This is a large thrust system that  
14 has been hypothesized.

15 So just to convert miles that people are  
16 comfortable, scientists, we talk in kilometers, meters,  
17 centimeters. So here just to give you some  
18 color-coding of the faults, these faults are far away.  
19 They don't induce significant ground motion at the  
20 site. Newport Inglewood/Rose Canyon is about 8  
21 kilometers away, but it's 8 kilometers to the west.

22 Now when we look at the hypothesized Oceanside  
23 Blind Thrust, it's 7 kilometers away, but it's right  
24 beneath the plant. Okay. So it cuts right beneath the  
25 whole shoreline of Southern California.

1           So, what's a blind thrust? So here we can see  
2 in the top panel that the layers here are offset.  
3 They're faulted. But as we move up a section, this  
4 fault dies that's why you don't see it at the surface.  
5 You only see folding and morphology of the fault.

6           Okay. This is called a blind thrust and it's  
7 due to compressional shortening, like pushing your  
8 bathmat together and you get folds and faults. Now,  
9 one thing I'm going to bring up later is this here,  
10 this block, is moving to the left or to the west.

11           The Oceanside Blind Thrust makes many  
12 predictions and we went out and measured them. But one  
13 of the predictions I'm going to show you here today is  
14 that this block is not moving to the west as the  
15 hypothesized Oceanside Blind Thrust predicts, it's  
16 moving to the south 90 degrees opposite of the model.

17           The model does not fit the observations  
18 offshore for the Oceanside Blind Thrust. The other  
19 model is this right-lateral strike-slip fault model.  
20 So if you're standing on this block, looking across the  
21 fault to the other block, it's deflected to the right.

22           Conversely, if you're standing on the other  
23 block, looking across the fault, the road is deflected  
24 to the right, so it's independent of your perspective  
25 angle. This is a right-lateral fault. These are

1 common faults in the offshore region. Okay.

2           These have very little vertical motion, it's  
3 horizontal. The thrust faults, at the top here, have a  
4 component, a large component, of vertical motion. And  
5 this will become more apparent why this is important  
6 under water because if we -- I have a large vertical  
7 component, I've pushed the water and I can generate  
8 tsunamis. Okay.

9           So here -- oh. Here we are looking at  
10 Catalina, Palos Verdes, the warm colors are shallow,  
11 the deep colors here are cool, and we're looking at  
12 these underwater features in the Inner California  
13 Borderlands, which is the lands offshore Southern  
14 California.

15           These two hypothesis have been put forth to  
16 explain the features we observe offshore and we're  
17 going to try to test, and convince you, how the data  
18 bears on this. So here we have the Oceanside Blind  
19 Thrust or we have these releasing and constraining  
20 bends on strike-slip faults.

21           So the geometry and extent of the hypothesized  
22 Oceanside Blind Thrust that's shown here is extensive,  
23 as I said, north of Dana Point to the border, and this  
24 is a cross section. So this is like looking down a map  
25 view, and this here is looking at a road cut that you

1 drive by in your car.

2 So if you saw this fault exposed and the rock  
3 in a road cut, it's dipping gently, about 23 degrees  
4 and it surfaces offshore shown here. Here's where it  
5 would intersect the Rose Canyon Fault and it goes down  
6 to depths of about 15 to 20 kilometers.

7 We've mapped extensively the geometry of the  
8 segmented strike-slip faults offshore, and this is a  
9 recently-produced map by our group. The red line show  
10 faults that are active. They have moved in the last  
11 10,000 years. So the San Diego Trough Fault that links  
12 up here to the San Pedro Fault is one of the largest  
13 faults offshore, but it's far away from SONGS. It's  
14 not too far away from this region up here.

15 The other active fault here that's shown is  
16 the Newport Inglewood/Rose Canyon and it's shown here  
17 in red. The other fault systems we can show are not  
18 active. This is the first map of the faults offshore  
19 that tells recency of deformation: Which faults are  
20 active, which faults aren't.

21 So here this geometry of this segmented  
22 strike-slip faults, when you have a right-lateral fault  
23 and you have a jog, you can either make compression or  
24 extension, and this is how this model explains the  
25 offshore features.

1           So here -- that's the light. We did spell  
2 "approach" right. So we spent 100-plus days at sea in  
3 2013, okay, testing these models. So these lines here  
4 are lines -- are group-collected to map the faults. We  
5 have the data density, new equipment resolution that  
6 were able to map these faults at an unprecedented  
7 scale.

8           And the nice thing is of all this data is  
9 going to be open source, that means is going to be  
10 publicly available. So there is a level of  
11 transparency in academia, that people have to have  
12 access to your data to test your ideas, make sure  
13 they're valid.

14           So here, just to go through this multi-beam  
15 bathymetry, this is like mapping the mountain ranges on  
16 land, but under water. We collected all of this and we  
17 worked with the USGS. These maps are publicly  
18 available on this website. It's been published in  
19 2015. It's been vetted by the USGS and the data are  
20 there for anyone who wants to look at them.

21           We also acquired 4500 line kilometers of 2D  
22 high-resolution sparker data, 100 square kilometers of  
23 3D data. We collected 3D data volumes across this  
24 fault to understand its architecture and interaction.

25           We also processed 2,000 line kilometers of old

1 legacy data with modern super-computer techniques.

2 Okay. We also processed other additional industry data  
3 from GEBCO and USGS archives.

4 We have different resolution, some are shallow  
5 but high resolutions, some are deep and less -- less  
6 resolution, but together they give us this nested  
7 approach, so we've been able to map these faults to an  
8 unprecedented scale. So I don't have much time.

9 These papers have been posted on the -- on the  
10 website. The last paper that just was accepted in JGR,  
11 which is one of the top high-visibility journals in our  
12 field, will be released in the next day or two.

13 I'm going to --

14 CHAIRMAN DR. VICTOR: I'm just going to add  
15 acronyms along the way, JGR is Journal --

16 DR. DRISCOLL: Journal of Geophysical --

17 CHAIRMAN DR. VICTOR: -- of Geophysical  
18 Research.

19 DR. DRISCOLL: -- Research. Thank you.

20 CHAIRMAN DR. VICTOR: It's the top journal.

21 DR. DRISCOLL: So here -- thank you.

22 I'm going to just jump into some of the  
23 results here. So here these are outlined in the paper.  
24 The one I really want you to focus on, because we're  
25 going to come back to this, is the Transport of the

1 Monterey block is to the south.

2           These onlapping or flat sequences that you're  
3 going to see reveals that the deformation becomes  
4 younger to the east and the deformation is old offshore  
5 here. There's localized regions of compression and  
6 extension. And basin depth increases above basement,  
7 Catalina basement, and the basement depth plunges or  
8 gets deeper to the south down off La Jolla.

9           And all of these results and the evidence for  
10 these results has been peer-reviewed and published in  
11 this paper. So here the offshore observations are not  
12 consistent with the predictions of the Oceanside Blind  
13 Thrust. We do not see evidence for it offshore.

14           And so, what you have to do in science, when  
15 the hypothesis makes predictions and it's not observed,  
16 you have to reject the hypothesis or refine it.

17           So here we don't see evidence offshore for  
18 this fault system. Okay. And we've presented this at  
19 a number of meetings: American Geophysical Union,  
20 Southern California Earthquake Center. We have  
21 published it. We have also presented it in SSHAC,  
22 Senior Seismic Hazard Assessment Meetings. So we've  
23 had this vetted by the community.

24           It is consistent with what we see with these  
25 offshore segmented strike-slip models. So let me walk



1 you through this. So the red are faults. Mount  
2 Soledad is one of these compressional jogs. Okay. So  
3 it's a right-lateral with a left jog.

4 And Mount Soledad is going up two and a half  
5 times faster than the regional uplift in Southern  
6 California. It's about 800 feet where the terrace is,  
7 along most of the margin, about 300 feet. So here  
8 where these faults jog to the right, I get basins, I  
9 make holes. Where they jog to the left, I get these  
10 red pop-ups.

11 And we can show that where these jogs occur is  
12 where the deformation occurs offshore, so the  
13 predictions of the segmented strike-slip faults are  
14 observed. In science, we can't prove a hypothesis is  
15 right, we can prove that is valid and consistent with  
16 the observations. We can only prove hypothesis are  
17 wrong when the predictions are not observed.

18 So I'm going to show one example: This is  
19 looking at these blocks and where these blocks are  
20 moving. This is here, just to orient you, we're up  
21 here in Dana Point. We're looking here at the margin,  
22 down here San Diego Bay, La Jolla here. I'm going to  
23 show you one line outlined in red. These are some of  
24 the lines we've used offshore that can strand the deep  
25 structure.

1           And this line 4515 shows that the blocks are  
2 moving to the south. They're not moving to the west.  
3 But before I jump into this, I just want to give a  
4 little insight into how we imagine the earth. So here,  
5 here's our ship. We drive back and forth. We mow the  
6 lawn. We literally just drive back and forth.

7           And if you're standing on the shoreline, you'd  
8 think we're crazy because you see us go this way, then  
9 that way. Okay.

10           And what we do is we emit a sound source and  
11 the sound source then -- this is the sea floor here --  
12 the sound source reflects off of the layers of sediment  
13 and this is because the layers of sediment have  
14 different velocities and densities and it reflects the  
15 energy back to a receiver called the Streamer.

16           So we're able to image the layers of the earth  
17 and fault structures. And these are much like tree  
18 rings. These are the Earth's rings. We can read these  
19 and understand fault history. Okay.

20           So, now let's look at some of these squiggly  
21 lines. Okay. All right. Yeah. This is a lot. Okay.  
22 So, I told you, this was going to be a fire hose.

23           Okay. So here's north, south. That scale is  
24 1.5 kilometers. This scale between these two numbers  
25 is about a kilometer. We always show un-interpreted

1 data and interpreted data because the minute I put the  
2 color lines on, you go, "Yeah, that looks good."

3 Okay. So you have to -- you have to figure it  
4 out yourself. And so let's just look at this. So,  
5 here I think everybody can see this feature here that's  
6 dipping and it goes up and we have lower frequency  
7 material here, near the surface, and we have the higher  
8 frequency are many more layers near the surface over  
9 here. Notice these surfaces are flat. They're not  
10 deformed. And notice these surfaces here are dipping.

11 So what's going on here? And we have cross  
12 lines to tie this and corroborate it. What we see here  
13 is, this is the top of the Catalina basement. Just  
14 like you see out in Catalina Island or we have big  
15 chunks of this right outside in the San Onofre Breccia.  
16 It's a metamorphic rock. It's blue and green. And  
17 it's called blueschist and greenschist.

18 And it dips to the south. The south is right  
19 behind that lamp (indicating). There is the north. So  
20 it dips this way. And you can see the layers above it  
21 are deformed and they're tilted and they're tilted more  
22 at depth than at the surface.

23 Let's just blow this up and look at this a  
24 little more.

25 So, here -- this is an enlarged scale -- south

1 to north, what we see is the Catalina basement goes  
2 down this what we call a ramp here and then flattens  
3 out. And we see the deformation here and, look, the  
4 layers above this are not deformed. They're  
5 flat-lined. Okay. But the most important thing is  
6 this block is moving south, not west as the model  
7 predicts. Okay.

8 So here this is just one of many observations  
9 that are presented in this manuscript, this published  
10 paper, that show the predictions of the Oceanside Blind  
11 Thrust model are not observed and, therefore, we reject  
12 it. The Oceanside Blind Thrust does not exist.

13 So just to summarize that -- and, I know, this  
14 is way up here and there's -- there's information. You  
15 can come to us. There's papers. But here the  
16 observe -- observations based on these offshore seismic  
17 surveys area not consistent with the predictions of the  
18 hypothesized Oceanside Blind Thrust. They are with the  
19 segmented strike-slip fault model with offsets and  
20 jogs. Okay.

21 The hazard for the Coastal region in Southern  
22 California is reduced because the slip on the purported  
23 Oceanside Blind Thrust doesn't exist and we know, from  
24 recent research, that in these thrusts the hanging wall  
25 actually has enhanced ground motion. So we won't have

1 that right underneath our coastline. All right.

2 And when we have this thrust under water, with  
3 a vertical component, we deflect the water and it can  
4 potentially be tsunamigenic. So, that risk is lower.

5 So here the first part of this talk, the  
6 Oceanside Blind Thrust, one of the seismic sources for  
7 the coastline and for San Onofre, based on the offshore  
8 data, we don't see any evidence for it. We reject it.  
9 It doesn't exist. Okay.

10 CHAIRMAN DR. VICTOR: Before you go on to  
11 the -- to the next segment where you talk about the  
12 Newport Inglewood/Rose Canyon, I just want to pause for  
13 a moment and see if anybody has any questions about  
14 Oceanside Blind Thrust. There'll be a test on this at  
15 the end, so sharpen your pencils.

16 Okay. Neal, why don't you talk about the  
17 areas where your find -- assessment has been done on  
18 the Newport Inglewood/Rose Canyon.

19 DR. DRISCOLL: Do you have a question?

20 MS. PATTERSON: Well, it looks like there's a  
21 question in the audience.

22 CHAIRMAN DR. VICTOR: No. When we get to  
23 the -- when we get to the public comment period, please  
24 make sure that your name is on the list and we'll get  
25 those questions in.

1 MR. HEADRICK: I have a question about the  
2 geology. I just asked you before.

3 DR. DRISCOLL: Okay. So here -- I'm moving  
4 on. So we've done section 1. We're going onto  
5 section 2. And this is the research that was just  
6 accepted in the journal of Geophysical Research and it  
7 deals with the architecture of the Rose Canyon/Newport  
8 Inglewood Fault system.

9 So here is the fault system. The parts we  
10 examined were from La Jolla up to Newport Beach. And  
11 what I'd like you to notice is these yellow boxes.  
12 These are what we call "stepovers."

13 These are where the fault segments are offset  
14 either to the west or to the east, and the segment  
15 boundaries here are defined by these segments. And all  
16 of these stepovers are 2 kilometers or less in width.

17 Based on empirical data from other fault  
18 systems, when a fall offset is 3 kilometers or less  
19 through-going rupture is permitted. So, theoretically,  
20 all of these fault segments, based on other work,  
21 previous work, empirical work, can rupture in concert  
22 from end to end. Okay.

23 And I'll talk about magnitudes, what that  
24 means, in the next slide. Newport Inglewood -- Newport  
25 Inglewood Fault here, magnitude 6.4 in 1933, Long Beach

1 is shown by the star. Okay.

2 When we look down in the Rose Canyon Fault,  
3 down here on shore trenching, it shows that the last  
4 time the fault moved was approximately 1650, plus or  
5 minus, about 120, 125 years. Okay. The slip on this  
6 fault is low. This is what we call a low-slip fault  
7 and it varies in the north from .5 to 2 millimeters in  
8 the south.

9 Some researchers argue that the .5 doesn't  
10 capture the distributed slip and it might be higher in  
11 the north, so the slip might be more uniformed along  
12 the way to the fault. Okay.

13 So here what I'd like to talk about is, based  
14 on the stepover distance, theoretically, all of these  
15 segments can rupture together.

16 And so I want to focus your eye on scenario 2,  
17 here, shown in B, and scenario 2B shown in C, so we're  
18 going to go down. This is just rupturing of La --  
19 La Jolla strand.

20 This is scenario 2 of rupturing all of the  
21 offshore strands, so they're shown here. The strands,  
22 if they're red, they don't rupture. So scenario 1 was  
23 just La Jolla.

24 Scenario 2 is all of the offshore segments  
25 ruptured. Scenario 2B is all of the offshore segments

1 ruptured and an onshore segment up here in the L.A.  
2 Basin. And here scenario 3 is where just here we  
3 rupture these three strands.

4 But the major results I would like you to  
5 focus on, and we calculated this by two different  
6 methods: One, by characteristic fault length, the  
7 Wells-Coppersmith, and, two, by direct measurement of  
8 the fault architecture, the length, and the slip.

9 So here what's really important is that both  
10 measurements yield kind of consistent numbers. So here  
11 in the direct measurement, we had low slip, .5, and we  
12 had high slip of 2 meters per event. The 2 meters per  
13 event is based on trenching in the Rose Canyon Fault  
14 system onshore that showed 2 meters of co-seismic slip.  
15 So here we're trying to bracket the slip.

16 And we also varied here the shear modulus, so  
17 that we had low shear modulus here, high here shear  
18 modulus here, again, the same thing. And this was  
19 set up so we could look at the range of possible  
20 earthquakes with direct measurement.

21 And what you'll notice is here, if all of the  
22 offshore strands rupture, we generate a magnitude of  
23 7.3 by the Wells-Coppersmith method, and here is lower  
24 for the low slip, but for the high slip with high shear  
25 modulus, we get the same magnitude, about a 7.3.



1           Now, scenario 2B, when we rupture the onshore,  
2 we have pretty much the same from the  
3 Wells-Coppersmith, but we get slightly larger.

4           So, based on our work and the theoretical and  
5 empirical work of other faults, the segments -- the  
6 stepovers between segments aren't large enough to  
7 inhibit or arrest through-going rupture, so we have to  
8 consider that rupture could go on all of the offshore  
9 strands, yielding a maximum earthquake of 7.3 and 7.4.

10           So, here based on water depth and radiocarbon  
11 dating that we've performed and estimate of sediment  
12 rates, we can show here that the segment off of  
13 San Onofre hasn't ruptured since about 10,500 to 13,600  
14 years before present.

15           So the northern segments have ruptured. The  
16 southern segments have ruptured, but the segments  
17 offshore here have not shown rupture or offset of the  
18 young sediments. And so here, when we take the onshore  
19 or an offshore data, even though it's theoretically  
20 possible that these can all rupture together, they  
21 haven't in the data time frame that we show here.

22           Okay. So here just looking at the summary of  
23 this and the Newport Inglewood/Rose Canyon Fault, we've  
24 mapped this out at high -- at higher scale and  
25 resolution. It's an unprecedented scale and

1 resolution.

2 And we're able to show that there's four  
3 segments, three stepovers. The stepovers are all  
4 2 kilometers or less, which permits through-going  
5 rupture. The whole system could rupture end to end.  
6 Okay. And the magnitude we'd get is about a 7.3-7.4.

7 As I pointed out though, the offshore and  
8 onshore data in the last 10- to 13,000 years don't  
9 reveal that all of the offshore segments have ruptured  
10 together. Okay. So that kind of wraps up that  
11 segment.

12 CHAIRMAN DR. VICTOR: Let me -- before we go  
13 onto the tsunamic, so the analysis -- the next step is  
14 to look at the tsunamic risks from this analysis.

15 Before we do that, I want to see if anybody  
16 has any questions about the analysis that's been done  
17 on this fault. Tim Brown?

18 And please understand our procedure, which is  
19 normal in public meetings, which is, the Panel is  
20 asking questions. We're going to go back and forth.  
21 And there's a public comment period. And I please urge  
22 you to make your questions in the public comment period  
23 and we will get answers either tonight or in written  
24 form later. Thank you very much.

25 VICE CHAIRMAN BROWN: So, Neal. Tim Brown,

1 City of San Clemente. So you talked about a rupture of  
2 all of the fault strands together and I'm assuming that  
3 probability of that, I mean, based on what you said,  
4 it's 10- to 15,000 years ago was the -- probably, the  
5 last episode of this.

6 It is possible though that different strands  
7 can rupture and wouldn't necessarily involve all of  
8 them. Let's -- give me an idea. Say -- say one of the  
9 faults strands erupted, the one most proximate to  
10 San Onofre, what could we expect in terms of a  
11 magnitude of that type of earthquake or just a  
12 single-strand ruptures instead of the entire whole  
13 thing?

14 DR. DRISCOLL: So -- so here some of the  
15 scenarios, like scenario 3 only had the segments right  
16 offshore.

17 VICE CHAIRMAN BROWN: Right.

18 DR. DRISCOLL: And that's high 6s and low 7s.

19 VICE CHAIRMAN BROWN: Okay.

20 DR. DRISCOLL: So here single segments would  
21 be in the mid-6s, 6.5, 6.7. But if you ruptured two of  
22 the adjacent ones right off SONGS, you could probably  
23 get up into a low 7.

24 VICE CHAIRMAN BROWN: And this may be where it  
25 talked about the Richter scale and how it has an order

1 of magnitude. So, remind me, from a mid-6 to a mid-7  
2 is an increase of how much in terms of --

3 DR. DRISCOLL: So here if you went from 6 to  
4 7, the amplitude is 10 times greater.

5 VICE CHAIRMAN BROWN: Okay. All right.  
6 Thank you.

7 DR. DRISCOLL: Okay. So for every number on  
8 the Richter scale, 10 times greater.

9 VICE CHAIRMAN BROWN: So, obviously,  
10 significantly much more than a single fault line and  
11 all acting in concert as far more -- far more  
12 disastrous?

13 DR. DRISCOLL: Yes.

14 VICE CHAIRMAN BROWN: Thank you.

15 CHAIRMAN DR. VICTOR: Pam Patterson next.

16 MS. PATTERSON: Thank you.

17 So in litigation both parties get to present  
18 their experts and there's a reason for that. So --  
19 and, actually, in both cases, with both parties, the  
20 experts have similar backgrounds and they've got their  
21 credentials yet you can get an entirely different story  
22 from one versus the other.

23 So we had, I would say, two meetings ago, I  
24 stated -- I mean, this is called a Community Engagement  
25 Panel yet the community is not being allowed to

1 participate.

2           And I said, just like in those news programs  
3 where you've got two sides presenting their opposing  
4 positions, that the community should be able to also  
5 present their side.

6           We've got Robert Pope here, who is a  
7 qualified -- he's an expert witness. He's a geologist.  
8 He's got the background. And I think, for this to be a  
9 transparent panel and for us to get both sides of the  
10 issues so that the community can make their own  
11 decision.

12           Right now, we've basically got a lawsuit where  
13 one party is getting to present their entire case, the  
14 other party is being gagged yet that party is the one  
15 that's paying for the whole litigation. They're paying  
16 for both sides. So --

17           (Applause.)

18           CHAIRMAN DR. VICTOR: Please. Please. Please  
19 can we just --

20           MS. PATTERSON: So my recollection is that  
21 when I brought this up two meetings ago, it was agreed  
22 that we would be able to do that and I have yet to see  
23 that.

24           In addition, you said -- and I believe I asked  
25 this question at that meeting "How does someone get

1 something on the agenda?" You replied that once a year  
2 there is an ad hoc committee of three that decides and  
3 sets the agenda for the entire year.

4 So I, first of all, would like to know who are  
5 the three people that have determined what the agenda  
6 is going to be for 2017.

7 CHAIRMAN DR. VICTOR: Can you -- do you want  
8 to continue with your comments?

9 MS. PATTERSON: Yes. So, of course, I'm not  
10 going to get the answer to that question.

11 So, secondly, how are we able to access the  
12 agendas for the rest of the year? I'm assuming, since  
13 you -- I'm assuming you've already had that meeting and  
14 you've already determined what the agenda is. We -- I  
15 want to see what the agendas are for the rest of the  
16 year. And I want --

17 CHAIRMAN DR. VICTOR: Why -- why don't we  
18 focus on the topic right now? And then --

19 MS. PATTERSON: Right. And the topic is that  
20 we are being shown one side by Southern California  
21 Edison. I mean, you go into, say, stewardship, like  
22 here's the theme that meeting cites: Safety,  
23 stewardship, engagement.

24 Number one, we wouldn't be here, meeting on a  
25 quarterly basis if there had been safety, you know.

1 Southern California Edison failed with safety.

2 Stewardship is, basically, an agency  
3 situation. And I like the fact that you use that  
4 because, basically, you're taking our money and you're  
5 determining what's going to occur with it.

6 So we have many residents and people from the  
7 community coming in and -- and they have consistently  
8 voiced concerns about the canisters that this spent  
9 fuel rod is being stored in, and the fact that, number  
10 one, we're dealing with a company that's already been  
11 shown --

12 CHAIRMAN DR. VICTOR: Can we just stay focused  
13 on the seismic risks? If you have other --

14 MS. PATTERSON: No. I am. I am staying  
15 focused on it.

16 CHAIRMAN DR. VICTOR: -- array of concerns,  
17 you can raise them later.

18 MS. PATTERSON: So, what I'm saying is that we  
19 need to see the other side of this from -- well, Robert  
20 Pope raised his hand. So, basically, yes, you're  
21 saying he can get up and talk for three minutes  
22 versus -- what? -- are we doing a 30-minute  
23 presentation here?

24 So Southern California Edison, which quite  
25 frankly doesn't have a history of being transparent and

1 honest with we, the ratepayers, who are actually giving  
2 them all of this money.

3 CHAIRMAN DR. VICTOR: But Dr. Driscoll is not  
4 from Southern California Edison. He's -- he's one of  
5 the world's leading --

6 MS. PATTERSON: But you chose him. You have  
7 chosen the speaker. We have the right --

8 CHAIRMAN DR. VICTOR: Because he did the  
9 research.

10 MS. PATTERSON: A community engagement panel  
11 means that the community -- we're the ones that are  
12 funding this -- has the right to have our own experts  
13 get up.

14 CHAIRMAN DR. VICTOR: Everybody's funding  
15 this, Pam. So why don't you continue with your  
16 comments?

17 MS. PATTERSON: No. We, the ratepayers -- so  
18 I'm bringing it up again.

19 CHAIRMAN DR. VICTOR: Okay.

20 MS. PATTERSON: Because I brought it up two  
21 meetings ago, that we, the residents, the community  
22 should absolutely have the right to make our own  
23 presentation.

24 CHAIRMAN DR. VICTOR: Okay.

25 MS. PATTERSON: So that we can find our people



1 to present the opposing side, if there is an opposing  
2 side.

3 CHAIRMAN DR. VICTOR: Okay. Thank you very  
4 much for your comment. I just want to just, for the  
5 record, make sure that we all recognize this is not a  
6 litigation. This is a discussion of a highly-technical  
7 topic, with the technical credentials, and the facts  
8 matter.

9 MR. PALMISANO: Excuse me. Though, it's not a  
10 discussion.

11 CHAIRMAN DR. VICTOR: Excuse me. I didn't --

12 MS. PATTERSON: It's a presentation, as it  
13 always is. There is no discussion from the community.

14 CHAIRMAN DR. VICTOR: Why don't you ask  
15 Dr. Driscoll a technical question or a question of  
16 interpretation as opposed to railing against the Panel?

17 MS. PATTERSON: No. I'm pointing out the fact  
18 that you're calling this a Community Engagement Panel  
19 and the community --

20 CHAIRMAN DR. VICTOR: Okay. There are several  
21 other flags up.

22 MS. PATTERSON: Right.

23 CHAIRMAN DR. VICTOR: Can we just get those  
24 other comments so we can, maybe, be democratic in our  
25 engagement here?

1 MS. PATTERSON: Well, we're not being  
2 democratic.

3 CHAIRMAN DR. VICTOR: So, Martha McNicholas  
4 and then --

5 MS. PATTERSON: -- because you're setting the  
6 agenda for the full year. You're not allowing us to  
7 participate.

8 CHAIRMAN DR. VICTOR: The agenda is being  
9 discussed later in this meeting. And there's, in fact,  
10 a slide in your deck, which is right in front of you,  
11 which is about that topic.

12 Martha McNicholas.

13 MS. McNICHOLAS: I do have a technical  
14 question.

15 CHAIRMAN DR. VICTOR: Thank you.

16 MS. McNICHOLAS: Your step -- definition of a  
17 stepover, if I understand it, the different strands  
18 along the coast is kind of like a gap between the  
19 strands -- the strands? Is that kind of the way I  
20 should interpret that?

21 DR. DRISCOLL: So sometimes it can be a gap or  
22 one fault stops.

23 MS. McNICHOLAS: Or an offset?

24 DR. DRISCOLL: An offset, they could overlap.  
25 Sometimes they actually bend.

1 MS. McNICHOLAS: Okay.

2 DR. DRISCOLL: So we look at these stepovers  
3 as areas, like here on this, that one of the fault  
4 strands comes in, it's complicated, and then it steps  
5 out onto another fault strand.

6 MS. McNICHOLAS: Okay. So it's kind of a  
7 discontinuity?

8 DR. DRISCOLL: Yes.

9 MS. McNICHOLAS: It's not one continuous fault  
10 all the way?

11 DR. DRISCOLL: So faults, when we look at  
12 faults closely, they're often segmented. On maps, to  
13 make it clear, we draw them as straight lines because  
14 we're showing the whole State of California. But  
15 perfect example: The San Andreas consist of many  
16 segments and strand and overlaps.

17 MS. McNICHOLAS: Okay.

18 DR. DRISCOLL: So this is common on fault  
19 systems.

20 MS. McNICHOLAS: Okay. I just wanted to make  
21 sure I understood the stepover. Thank you.

22 DR. DRISCOLL: Yes. All right. Thank you.

23 CHAIRMAN DR. VICTOR: Thank you very much.

24 Ted Quinn.

25 MR. QUINN: Ted Quinn.

1           Dr. Driscoll, where the strands, like in front  
2 of Dana Point and down in Las Pulgas, there's multiple  
3 strands in parallel. What occurs there when you have  
4 multiple strands?

5           DR. DRISCOLL: So here the deformation can be  
6 distributed. It can run off one strand. But -- so  
7 here when faults end, they usually get complicated and  
8 splay out into a number of faults and we call these  
9 horsetails.

10           So you can imagine that, as the fault ends,  
11 the slip on the fault diminishes and goes to zero and,  
12 therefore, it's distributed into smaller faults.

13           CHAIRMAN DR. VICTOR: Dan Stetson. Ted, do  
14 you have anything further?

15           Dan Stetson. And then I do want to move on  
16 very briefly to Glenn Pascall, if you have a brief  
17 comment after Dan. Dan.

18           SECRETARY STETSON: Thanks. With a maximum of  
19 7.3 or 7.4, what would you anticipate the peak ground  
20 acceleration that would be possible with that?

21           DR. DRISCOLL: That is a complicated  
22 calculation and we don't -- because it's due to a  
23 number of a different things and we're working on -- we  
24 have a model that we're working on and a paper that we  
25 don't want to present until it's peer-reviewed that

1 shows how the ground motion changes with directivity,  
2 so whether it starts in the south and moves to the  
3 north.

4 But that's a complicated relationship, to  
5 transfer a Richter scale into peak ground acceleration.  
6 It's depended on the distance from the epicenter,  
7 propagation direction of the fault and the  
8 characteristics and heterogeneity of the intervening  
9 rock.

10 CHAIRMAN DR. VICTOR: Let me know take as an  
11 action item that, at a minimum, we should share with  
12 the Panel how that calculation was done originally for  
13 the original design basis; that's a question for  
14 Edison. And then as soon as this paper has been  
15 through peer review, we would like to hear from you.

16 DR. DRISCOLL: Would be happy to happy to put  
17 it on. And it's very I -- I didn't want to bring  
18 images and a movie from that paper because it hasn't  
19 been peer-reviewed.

20 Peer review is the gold standard in academia.  
21 So we send our papers in, editors pick talented,  
22 top-rate scientists to review your paper. They  
23 comment. They, usually, are anomi -- anonymous or  
24 redacted because that way they can say the critical  
25 things and not hurt you when they see you at the next

1 meeting. You can still have a beer.

2 CHAIRMAN DR. VICTOR: Okay. I'm going to,  
3 just in the interest of time, move beyond the  
4 socialization of science and back to Glenn Pascall.

5 MR. PASCALL: Briefly. My father was an  
6 earthquake geologist and a recognized expert on the  
7 San Andreas Fault. And I just want to note that  
8 Scripps Institute has reported to us that there's a  
9 potential for a 6.5 to 7.4 event close to the plant and  
10 that is hardly stonewalling.

11 And the next question is, what kind of tsunami  
12 phenomena that might generate and what kind of  
13 challenge might pose for an structure at San Onofre?

14 That's the bottom line.

15 DR. DRISCOLL: Definitely.

16 MR. PASCALL: And we have been given a very  
17 significant report that there are potentials here, and  
18 I'm looking forward to moving onto what you estimate  
19 the consequences might be.

20 CHAIRMAN DR. VICTOR: Okay. Well, you read my  
21 mind, Glenn. With your indulgence, Panel, I'm going to  
22 give the floor back to Neal.

23 DR. DRISCOLL: Okay. Thank you.

24 Very good question. So one of the things that  
25 we're going to talk about in the next segment of this

1 talk is tsunamigenic risk. And the strike-slip faults  
2 can engender a landslide and these underwater failures  
3 can accelerate and actually cause tsunamis. And we'll  
4 talk first about far-field tsunami. So if I could use  
5 the next few slides as a platform to address your  
6 question, will that be okay?

7 CHAIRMAN DR. VICTOR: More than okay.

8 DR. DRISCOLL: Okay.

9 CHAIRMAN DR. VICTOR: Please do.

10 DR. DRISCOLL: So here this is a map of the  
11 topography and offshore bathymetry for California,  
12 going up here into the San Francisco region. Here's  
13 point conception to locate you. Here's Catalina,  
14 San Clemente Island, here's San Diego. The blue  
15 separates -- this is the shoreline. Okay. This is  
16 Santa Rosa, Santa Cruz Island, Anacapa.

17 And what I'd like you to notice, so here  
18 San Clemente is about 70 nautical miles offshore of  
19 San Diego Bay. So this gives you somehow kind of range  
20 that this region is about 150 kilometers wide.

21 And what I'd like you to notice is the  
22 topography underneath the water is complicated.  
23 They're shoals, like Cortes Bank, Tanner Bank, great  
24 surfing locales and big waves. These are shoals.

25 And then there's adjacent deeps and valleys.

1 So as the tsunami energy comes from far-field, like the  
2 1960 Chilean earthquake, which is the largest on  
3 record, 9.5, or the '64 Alaskan Good Friday earthquake,  
4 9.2, or the Sumatra Boxing Day 2004 earthquake, 9, or  
5 Tohoku earthquake in 2011, magnitude 9. All of these  
6 large magnitudes are in subduction zones. They're not  
7 on faults, like we have here in Southern California.

8 So as the far-field tsunami moves across the  
9 Pacific ocean, it speeds airplane speeds, 4-500 miles  
10 an hour. It comes along the shoreline. And when it  
11 hits the shoreline, it slows down to highway speeds.  
12 Well, not here in California.

13 And so as this waves slows down, it builds up  
14 an amplitude. But here, in what we call the  
15 Inner California Borderlands, the energy of the tsunami  
16 builds up and then it goes over deep water and  
17 collapses.

18 So the Inner California Borderlands, this  
19 topography that's created by the changing of a  
20 subduction margin to a strike-slip margin that started  
21 about 30 million years ago, this has created a natural  
22 baffle for far-field tsunamis. Okay.

23 So we're -- we're in a good position there  
24 versus north of point conception. San Francisco,  
25 Trinity have had pretty large tsunamis because the



1 margins narrow. The wave comes in, hits the  
2 shoalwater, the amplitude grows, and then it hits the  
3 coastline. So this natural baffle that's been  
4 well-known is something that takes down tsunami energy.

5 So here this slides just represents that  
6 again. This is some of the high-resolution bathymetry  
7 we acquired. Again, red hot are shallow; cool, deep.  
8 You can see the island systems here and the deformation  
9 in all the canyons.

10 But this offshore topography and islands is a  
11 natural baffle to tsunamigenic energy. So, far-field  
12 tsunamis are not as big a risk here in this Inner  
13 California Borderlands. So that's, hopefully, one  
14 part.

15 The other part is, we have near-field  
16 tsunamis. Near-field tsunamis happen when an  
17 earthquake has vertical motion, like on a subduction  
18 zone. Tohoku, they had a tsunami that hit the  
19 shoreline, that's near-field. You have minutes to  
20 maybe half an hour. Far-field, you have hours. And we  
21 have, you know, tsunamis buoys out there and we can  
22 detect it and we can give tsunami warnings.

23 We didn't have tsunami buoys in the Indian  
24 Ocean 2004, the Sumatra earthquake, and hundreds of  
25 thousands people died from that tsunami. Okay. Loss

1 of life was horrific.

2 So, near-field is caused by either fault, a  
3 thrust fault, having vertical motion, a strike-slip  
4 fault having a dip-slip component. You have to have  
5 something that moves the water either up or down. All  
6 right.

7 Strike-slip faults are mostly horizontal.  
8 They're steep. They do have a component of what we  
9 call dip-slips, so the plates go not just like that  
10 level, but they can go like that. Okay.

11 If we generate an underwater failure that  
12 accelerates like the 1929 Grand Banks earthquake, that  
13 landslide under water, it accelerated to 100 kilometers  
14 per hour. And you're thinking, how does he know that?  
15 How does he know that?

16 Well, we ruptured successive cables to Europe  
17 as the slide went down the bottom. So we have timing  
18 of when communication went out on the successive  
19 cables.

20 When it accelerated like this, the tsunami  
21 that was generated killed 51 people in Newfoundland.  
22 Now, in 1929, that was probably a large portion of the  
23 population of Newfoundland.

24 So, these -- these near-field tsunamis are a  
25 threat and they come upon us really quick. We have

1 minutes. Most of the models, like slide on 30-mile  
2 Bank, predict a 6-meter tsunami. This is work by  
3 Kirby.

4 So other work done by myself on the East Coast  
5 using certain equations, we showed in 2000 that a slide  
6 on the Currituck slide could generate a 5-to-7 meter  
7 tsunami. So that range is what some of the estimates  
8 are yielding for these landslide-generated tsunamis.

9 The sediment we've coring offshore here, the  
10 sediment is very stiff and old, and very cohesive. The  
11 sediment that's more tsunamigenic is sands that aren't  
12 cohesive and can get mixed into the water and create  
13 this underwater flow that accelerates.

14 And the tsunamigenic capability of a flow is  
15 most controlled by its acceleration. So the sediments  
16 here that we've sampled on the margin are stiff,  
17 cohesive and they're radiocarbon dead. They're old.

18 The other thing is that we've mapped the  
19 layers here in this whole basin and we don't see large  
20 blocks or slides like we see in lake Tahoe or off  
21 New Zealand or off Hawaii, off the Canary Islands, off  
22 the Grand Banks. We don't see evidence for past large  
23 slope failure in this region.

24 Does that mean it won't happen in the future?

25 No. But we're using the geologic record much

1 like paleoseismology for paleo-tsunami-slope failure.  
2 And we don't see these large blocks. And during the  
3 question period, I'll be happy to show some regions  
4 that do have large failures that could be tsunamigenic.

5 So with that, I'd like to summarize the  
6 tsunami hazard. This irregular bathymetry offshore  
7 here, the Inner California Borderlands access a natural  
8 baffle to far-field tsunamis and knocks them down.

9 Potential near-field tsunami sources are  
10 engendered by earthquakes on local faults systems or by  
11 slope failure. We don't see evidence for large slope  
12 failure and the data set we've collected all the way  
13 out to San Clemente Island. Okay.

14 Finally, largest historical tsunami wave  
15 height in California was 4.5 meters, recorded in  
16 San Francisco. You're probably asking yourselves, but  
17 what was the largest one here in Southern California?  
18 It was the 1812 tsunami that was 3.4 meters, same  
19 earthquake that knocked down San Juan Capistrano  
20 Mission. So, 3.4 meters is the largest historical  
21 tsunami that's been recorded in Southern California.

22 And with that, I'd like to thank you for your  
23 time. Thank the Panel members and look forward to --  
24 to questions.

25 CHAIRMAN DR. VICTOR: I want to thank you very

1 much. And I also want to thank you, in particular,  
2 Neal, because it is challenging to take all the  
3 technical work that you do and to turn it into plain  
4 English and you've done this very well.

5 Jerry Kern, do you want to -- we have time for  
6 a couple of questions about the tsunami risk.

7 Jerry Kern.

8 MR. KERN: Thank you. Excuse me.

9 Okay. Dr. Driscoll, you stated in your  
10 research conducted in the region surroundings SONGS  
11 provided focused seismology, ground motion, attenuation  
12 at SONGS site that could be expected from earthquake  
13 generated close to SONGS, and the case of Newport  
14 Inglewood/Rose Canyon Fault structure has been  
15 identified having the greatest potential.

16 I'm trying to understand the relationship of  
17 ground motion generated from the distant fault and the  
18 effect specific to -- to SONGS. So everything we've  
19 talked about so far has been offshore.

20 So was there site-specific ground motion  
21 performed on the on -- seismic research on -- onshore?

22 DR. DRISCOLL: So our research mostly focused  
23 on offshore. I believe that SONGS, they've conducted a  
24 number of onshore experiments. They've looked at  
25 terraces and uplift rates. They've looked at trenches.

1 They have put in GPS instruments to document the motion  
2 of the plate and I think they've also put in some  
3 seismometers. But I think some of the seismometers  
4 that were planned fell into this time window of  
5 decommissioning of the plant, so the instruments were  
6 bought, but I don't believe, to date, they've been put  
7 on site.

8 MR. KERN: So that might be a good question  
9 for Tom.

10 CHAIRMAN DR. VICTOR: Let's -- let's make sure  
11 that either we'll get that information from Tom tonight  
12 or we will do a follow up to make sure of that  
13 information.

14 MR. KERN: Okay. So I think we were so  
15 focused offshore, have we done soil samples onsite?

16 DR. DRISCOLL: There have been some borings up  
17 in the upper parking lot. I believe there were some  
18 borings there that went through.

19 So, here the site has alluvium, then it has  
20 the San Mateo formation, and underneath that is the  
21 Monterey, and so I know that some of the borings they  
22 conducted to do ground motion because you need the  
23 sediment properties to convert magnitude into ground  
24 motion. So I believe these have been collected and  
25 studied to some degree by a company called GeoPentech.

1 MR. KERN: Okay. So did --

2 DR. DRISCOLL: And the GPS were installed. I  
3 know that several sites were installed in Camp  
4 Pendleton and SONGS did a lot of work negotiating with  
5 Camp Pendleton who put these GPS sites in, and they  
6 were going to collocate some of these seismometers and  
7 I think that work did not get done. But I think we  
8 should have Tom check into that and get back.

9 CHAIRMAN DR. VICTOR: Yes, let's follow up on  
10 that item.

11 MR. KERN: Both. Both Toms check into that.

12 CHAIRMAN DR. VICTOR: Jerry, other items?

13 MR. KERN: That's fine. The only other thing,  
14 I guess, I've -- and, I guess, you're going to have  
15 that study because, you know, the makeup of the ground  
16 is very important. Obviously, if you're standing on a  
17 slab of concrete and you whack it with a sledge hammer,  
18 you can feel it quite a distance.

19 DR. DRISCOLL: Yep.

20 MR. KERN: But if you're standing in a pool of  
21 ping-pong balls and you whack the ping-pong balls, you  
22 know, you don't feel it maybe half foot away. So I  
23 guess that's the makeup of the ground, and I'm not  
24 clear what that is when we talk about, you know,  
25 transference of activity to the site.

1 DR DRISCOLL: Right. How the energy is  
2 attenuating.

3 CHAIRMAN DR. VICTOR: Okay. And this relates  
4 very closely to the -- to the analysis that has been  
5 done and is being done on translating the faulting  
6 events, potential faulting events, to ground motion.  
7 So we'll take these up.

8 Jim Leach, did I see that you had your flag  
9 up?

10 MR. LEACH: No.

11 CHAIRMAN DR. VICTOR: No? Okay. I just  
12 imagined that your flag was up.

13 Briefly, Tim Brown.

14 VICE CHAIRMAN BROWN: So I, actually, have  
15 here a report that was submitted by Public Watchdogs.  
16 It was by Mr. Pope.

17 It was submitted this morning and I --

18 CHAIRMAN DR. VICTOR: I believe we circulated  
19 that almost immediately to the whole Panel.

20 VICE CHAIRMAN BROWN: Yes, the Panel received  
21 it. And it seems to be we received this so late, I  
22 really didn't have a chance to receive it. But one of  
23 the things that it -- it references your study, really  
24 not much in terms of scientific research as much as  
25 refutations.



1           And one of the things it says is that the USG  
2 warrant says there's 75 percent probably of a magnitude  
3 of a 7.0 or greater earthquake for Southern California  
4 in the next 30 -- 30 years and a 93 percent chance of a  
5 6.7 or greater or 100 percent chance of a 6.0 or  
6 greater. Now, this says Southern California.

7           Can you speak to that assertion and what that  
8 might mean?

9           DR. DRISCOLL: Our work on these faults,  
10 what's really exciting is with the fault -- define the  
11 fault planes on the Newport Inglewood/Rose Canyon  
12 Fault, they're dipping. The dip changes from, like, 70  
13 degrees on some segments to near vertical or changes  
14 orientation.

15           And it's one of the first studies that has  
16 done the characterization of this unprecedented scale  
17 so that we can directly calculate what the earthquake  
18 magnitude would be.

19           And, also, we've combined these with  
20 researches at UNR and presented this at the Seismic  
21 Society of America, and the audience reflected on this  
22 and said it's the first time that scientist have used  
23 the mapping technique, defining the faults, calculating  
24 what the earthquake magnitude could be, and then taking  
25 all of that information and trying to put it into a

1 ground motion model.

2 So, leaders in the field, like Norm Sleep,  
3 were really excited that we've taken this research to  
4 this level.

5 Now, the USGS and UCERF3 makes predictions of  
6 earthquakes and budget, but they budget all of the  
7 California system, so the small-slip faults are small  
8 part of a budget when you look at the San Andreas that  
9 has on the order of, like, 20 to 22 millimeters of  
10 slip. San Jacinto that has 18, 19 millimeters of slip.  
11 Then you look at this fault, it could be .5 to 2  
12 millimeters of slip.

13 So to kind of balance things, the whole  
14 offshore, all of the faults in the offshore are only  
15 about 10 percent of the budget. And so our estimates  
16 are defined by characterizing the faults and the  
17 stepovers and I think this gives more confidence in  
18 trying to calculate earthquake magnitudes.

19 So the numbers, the USGS and others, are  
20 consistent with ours, but I think we have a way to say  
21 these are the maximum for these segments, and it's not  
22 7 or larger and the, probability, of these small slip  
23 faults is difficult because -- let's just look back at  
24 Rose Canyon, and I told you that the last event was  
25 1650, plus or minus, 120 years.

1           The event before that was like 6,000 years  
2 ago. And the event before that, there were two or  
3 three close around 8,000 years ago. So, now trying --  
4 what we try to do, like we did work, we published in  
5 Nature on the San Andreas and we could show that for  
6 the last eight cycles, the San Andreas did this  
7 (indicating).

8           VICE CHAIRMAN BROWN: Irregularity.

9           DR. DRISCOLL: And then it's doing this  
10 (indicating).

11           So, what we do is, we develop probability  
12 functions of the likelihood through time when you look  
13 at the most recent event versus the recurrent interval,  
14 you can develop probability functions of when, you  
15 know, this earthquake may rupture in the next 10 years,  
16 20 years, 30 years, but we can't predict earthquakes.  
17 Okay.

18           CHAIRMAN DR. VICTOR: Great. Thank you very  
19 much. Tom Palmisano, I know you wanted -- now we're  
20 going to go over the line from the seismic and tsunamic  
21 analysis to the implications for the plant itself.

22           You have one slide to kind of summarize where  
23 you are and as the main purpose of tonight was to hear  
24 from Neal Driscoll about all the work they've been on  
25 the seismic and tsunami risk, but summarize where the

1 plants operators are now.

2 MR. PALMISANO: Okay. Thank you very much.

3 So, again, if I go back to what I said in the  
4 introduction, a lot of this started -- you know, it was  
5 directed by the California Energy Commission, codified  
6 in AB1632 and the California Public Utility Commission,  
7 you know, directed us to do this and funded this.

8 This was really driven by the concern,  
9 initially, about a hypothesized or postulated oceanside  
10 blind thrust, okay, you know, offshore as well as under  
11 the plant and the potential significance. So that was  
12 an important question we had and that was important to  
13 understand the conclusions of this research and I'll  
14 summarize my points in a minute.

15 Secondly, as we talked earlier, when the plant  
16 was originally designed again, we looked at  
17 earthquake's magnitude 5 or greater out around 200  
18 miles because, as we said, it's really the ones that  
19 are close to the plant that really you have to design  
20 for because they would trans -- they're close enough,  
21 they're going to transmit the most energy to the plant  
22 and we initially established that 0.67 ground  
23 acceleration at the time and plant design and licensing  
24 corresponding to about a 7.0 on the Richter scale.

25 Subsequently, with the Oceanside Blind Trust

1 Fault, we did several reevaluations after 2000 and,  
2 number one, concluded the plant was designed and built  
3 conservatively enough with enough margin that it could  
4 withstand a 7.5, which we thought would be a  
5 combination of the Newport Inglewood/Rose Canyon and  
6 the Oceanside Blind Thrust should it exist. Okay.

7 So we concluded, while the plant was  
8 operating, the plant, the reactors, the spent fuel as  
9 well as the dry cask storage system could withstand up  
10 to a 7.5 on that close fault, that Newport  
11 Inglewood/Rose Canyon, including the Oceanside Blind  
12 Thrust.

13 We also, as a second bullet -- this bullet  
14 here indicates the seismic design of the ISFSI. Again,  
15 the original dry cask storage system was raised to  
16 1.5g, ground motion, to account for that potential  
17 blind thrust.

18 So, fortuitous, if you will, good foresight  
19 when the California Coastal Commission permitted that,  
20 they insist we raise the seismic criteria for the dry  
21 cask storage system.

22 So as we stand today, the reactors are  
23 defueled, permanently retired. They're not in play  
24 anymore in terms of seismic capability. The spent fuel  
25 pools are in service and they are important, so they

1 need to be withstand a postulated seismic event.

2 So when I look at these conclusions, one, it  
3 appears the data -- and I'll defer to the researchers  
4 and the peer-reviewed conclusions -- it appears the  
5 Oceanside Blind Thrust is not supported by the data,  
6 that helps me judge the risk to the spent fuel pools  
7 and the plant and the dry cask storage is reduced.

8 There's still an earthquake risk. The Newport  
9 Inglewood/Rose Canyon Fault is real, as we just heard.  
10 It may not have ruptured on all segments historically,  
11 but it could. We need to understand we could be in  
12 this range of 7.3 to 7.4 in the Richter scale.

13 The spent fuel pools have been analyzed and  
14 can withstand that, maintain their integrity, maintain  
15 the water, protect the spent fuel. And the ISFSI, the  
16 dry cask storage system, is much more than capable of  
17 withstanding that because it has virtually twice the  
18 seismic capability.

19 The new dry cask storage system is being,  
20 again, built with twice the seismic capability, if you  
21 will, of the spent fuel pools.

22 So as an operator or decommissioning manager,  
23 I would say, look at it, the spent fuel pools are  
24 adequately designed and built and protected to  
25 withstand the maximum expected earthquake on the faults

1 that matter and the dry cask storage system is built --  
2 being built to withstand those earthquakes. That's  
3 what I take away from this research.

4 CHAIRMAN DR. VICTOR: Thank you very much.

5 I want to see -- Pam Patterson, you have your  
6 flag up?

7 MS. PATTERSON: Well, yes. Is this on?

8 Because I also had some questions that I'd  
9 like to get a response from with respect to -- so this  
10 is a geologist. So, according to University of  
11 Southern California Geologist James Dolan, "The Newport  
12 Inglewood Fault is far more dangerous the further south  
13 it goes."

14 "History demonstrates this with magnitudes of  
15 about 4 in the vicinity of Culver City, but it  
16 increases as it goes south. 6.2 in the 1933 Long Beach  
17 earthquake and a predictable future quake of 7 or  
18 greater along the offshore Newport Inglewood Fault."

19 "Because the Newport Inglewood Fault is as  
20 deep as the San Andreas Fault, the relative lack of  
21 movement shown will increase, not decrease, in risk  
22 factors." So --

23 CHAIRMAN DR. VICTOR: Can I put that  
24 question -- can I put that question to our  
25 Seismologist, Geologist, Neal Driscoll? Will that be

1       okay with you?

2                   MS. PATTERSON:   That will be okay.

3                   CHAIRMAN DR. VICTOR:   Okay.

4                   MS. PATTERSON:   But then I would also like to  
5       hear from Robert Pope with respect to what he thinks,  
6       so I would like to have both.

7                   CHAIRMAN DR. VICTOR:   My interest is we're  
8       going to hear from Robert Pope during the question  
9       and -- during the question period.   Okay.

10                   Neal Driscoll?

11                   DR. DRISCOLL:   So Jim Dolan at USC, stating  
12       that the fault -- the likelihood or the danger of the  
13       fault moving south, our research shows that all of  
14       these segments can rupture together.

15                   The stepovers are all 2 kilometers or less  
16       and, based on empirical fault data by numerous  
17       researches, Steve Wesnousky, Published in Nature, 3  
18       kilometers seemed to be the tipping point.   So at 3  
19       kilometers or less through-going rupture can occur.

20                   So the numbers we have reported here are  
21       consistent with James's speculation, but the nice thing  
22       is this is based on observations and constraints from  
23       seismic data at an unprecedented scale.   So we have  
24       data that we can input into these earthquake models, so  
25       we have confidence in the calculations.



1           So I hope that answers your question.

2           CHAIRMAN DR. VICTOR: Thank you.

3           Did that answer your question, Pam?

4           MS. PATTERSON: Well, of course, I want also  
5 to get the input from Robert Pope. But thank you for  
6 your response.

7           CHAIRMAN DR. VICTOR: Okay. The purpose of  
8 tonight was to have the folks who've done this work now  
9 over many years using all this new seismic data, and so  
10 this is not -- I appreciate that in the courtroom there  
11 are dueling experts and dueling facts.

12           But -- but, you know, I think it is also  
13 important that we recognize that there is a process in  
14 science that produces assessments and quality  
15 assessments and we're -- we benefit tonight by having  
16 Neal tell us about what the best in the business is  
17 doing having gone through peer-review at journals like  
18 Nature, the most important scientific journal in the  
19 world.

20           MS. PATTERSON: Right. But in that situation,  
21 you've got multiple teams of scientists working on the  
22 same thing and so they report back their own findings.  
23 So we're not -- even with respect to science, you're  
24 not listening to one team or one scientist.

25           CHAIRMAN DR. VICTOR: Yeah, I think that's --

1 I think that's an extraordinary charge because actually  
2 the process of writing and preparing and getting  
3 reviewed a paper like this involves looking at the  
4 whole range of published incredible hypothesis and  
5 to -- I do thing it's important that we not go over the  
6 line and claim that scientists are somehow ignoring  
7 established information that is credible out there.

8 Tom?

9 MR. PALMISANO: One comment, the numbers I  
10 just heard quoted, you know, the magnitudes as you go  
11 farther south on Newport Inglewood/Rose Canyon, you  
12 know, they are numbers we have assumed could occur in  
13 the design of the plant and the design of the dry cask  
14 storage, so those numbers are accounted for in the  
15 seismic design for the facility.

16 CHAIRMAN DR. VICTOR: Garry Brown and then Tim  
17 Brown and then I do want to break. Garry Brown?

18 MR. BROWN: Someone in our -- I guess, I'm  
19 trying to just --

20 MR. PASCALL: Speak into the mic.

21 MR. BROWN: I'm trying to distill all this  
22 down to a layman understanding of this. And we can't  
23 predict earthquakes. And even though we're not  
24 producing electricity, the pools are critical, and so  
25 those have to be protected.

1           And when I read your final implications of  
2 findings, it says, if, basically, the segments all  
3 rupture together, we could have a 7.3 or 7.4 and then  
4 Tom provides comfort that that's lower than 7.5. I  
5 guess, my question is, we're talking about one 10th of  
6 1 percent. What if --

7           MR. PASCALL: No, not with the Richter scale.

8           MR. BROWN: Not with the Richter scale, but if  
9 it's -- what if there's a little variance?

10          MR. PALMISANO: Yeah.

11          MR. BROWN: And what, you know -- 7.3 or what  
12 if it's 7.6?

13          MR. PALMISANO: So --

14          CHAIRMAN DR. VICTOR: Can you talk just  
15 briefly and then we move on?

16          MR. PALMISANO: Yes. Just very briefly, those  
17 are very robust structures. I'm giving you  
18 conservative numbers.

19          MR. BROWN: Okay.

20          MR. PALMISANO: If we really had -- you know,  
21 if the plant was still operating and there was a real  
22 question of how much margin and we analyzed it,  
23 those -- those structures will withstand greater than  
24 the 7.5. There's margin there that we don't credit.

25                 When we do analysis to satisfy the NRC, we're

1 conservative. We estimate on the high side for the  
2 earthquake, we estimate on the low side for the  
3 capability of the structure, there's conservative  
4 there. The other thing, in this day and age, none of  
5 that fuel has operated for over five years now.

6 MR. BROWN: Right.

7 MR. PALMISANO: You know, and if you remember  
8 a couple of years ago, I showed a logarithmic decay  
9 curve for the decayed heat. Okay. To protect the  
10 fuel, they simply need to stay intact and stay covered  
11 with water. I don't need active pumps immediately  
12 anymore. So there's lots of robust margin in the  
13 pools.

14 So, don't look at 7g. If it's 7.4, the pools  
15 are only good to 7.5. If I had to re-analyze, which  
16 doesn't make any sense from the stewardship of money  
17 because it's not pertinent, if you will, if an  
18 operating reactor is retired. There's margin in those  
19 structures.

20 MR. BROWN: When these structures were built,  
21 was there a Richter scale they were built to that was  
22 stipulated and --

23 MR. PALMISANO: Yeah, original -- originally,  
24 the original assumption was 7.0 on the new -- 7.0 on  
25 the Newport Inglewood/Rose Canyon Fault for the

1 original design basis.

2 MR. BROWN: Okay. Thanks.

3 CHAIRMAN DR. VICTOR: Okay. Tim Brown, very  
4 briefly.

5 VICE CHAIRMAN BROWN: So this is the crux of  
6 the matter, when is it that we -- that the pools would  
7 be emptied and they'll all be transferred into dry cask  
8 storage?

9 MR. PALMISANO: The pools will be emptied by  
10 mid-2019 or earlier on the current schedule.

11 VICE CHAIRMAN BROWN: Okay. So we're really  
12 talking a period of about two years until everything is  
13 in dry cask storage?

14 MR. PALMISANO: Yes. So as you heard me talk  
15 before, for a decommissioned plant without a need for  
16 an active spent fuel pool, the right thing to do, and  
17 if you go across the country, is to empty the pools as  
18 soon as you can safely empty them.

19 VICE CHAIRMAN BROWN: That's right. And --

20 MR. PALMISANO: And, again, in our ISFSI  
21 system, the dry cask storage, as robust as it is, even  
22 much more so than the plant itself, it simply makes  
23 sense.

24 VICE CHAIRMAN BROWN: Right. So the ISFSI and  
25 the dry cask storage is, by far, the optimal solution

1 in terms of earthquake preparedness?

2 MR. PALMISANO: In terms of onsite storage.

3 VICE CHAIRMAN BROWN: Right. And it's a  
4 robust, massive concrete and steel structure that  
5 couldn't tear anything, but the real -- one of the  
6 questions, I think, that was raised, in reading some of  
7 the papers, was what happens to the fuel inside the  
8 cask in terms of movement?

9 So, let's say it doesn't rip it apart or does  
10 that, but is there an opportunity for movement within  
11 the rods within those units? Because there's -- you  
12 know, with what we consider rendering things apart or  
13 tearing apart or causing rupture.

14 MR. PALMISANO: Yeah. So -- so the casks are  
15 analyzed for an earthquake scenario.

16 VICE CHAIRMAN BROWN: Okay.

17 MR. PALMISANO: So, again, you go to peak  
18 ground acceleration is what you input to the canister  
19 system or to the base slab. They're analyzed to  
20 withstand at 1.5g in a horizontal direction, 1g in the  
21 vertical direction and shows that the fuel assembly  
22 stay intact in the canisters.

23 VICE CHAIRMAN BROWN: Inside the canisters?

24 MR. PALMISANO: Inside the canisters.

25 VICE CHAIRMAN BROWN: Okay. Thank you.

1           CHAIRMAN DR. VICTOR: Yeah. And this is when  
2 we come -- our next meeting will be about consolidated  
3 interim storage. And we're also going to continue this  
4 focus on what does Defense-in-Depth means,  
5 understanding what the long-term stewardship is of  
6 these canisters so long as they're here and also our  
7 obligation to the canisters as they go to a  
8 consolidated facility.

9           MR. PALMISANO: Right.

10          CHAIRMAN DR. VICTOR: Jerry Kern, very  
11 briefly.

12          MR. KERN: Okay. Jeff, one quick question.

13                 Or, actually, one quick question to Tom and  
14 Tom about the monitoring devices: Do you have  
15 monitoring devices on site and who monitors them?

16          MR. PALMISANO: Historically, there's been  
17 seismic detectors on site when the plant was operating  
18 that triggered and alert us to a seismic event. Okay.

19          MR. KERN: But when you were operating. But  
20 is there one now?

21          MR. PALMISANO: They will be retired after the  
22 spent fuel pools are emptied.

23          MR. KERN: Okay. So they're on site now and  
24 there's no --

25          MR. PALMISANO: I believe -- let me get back

1 to you on that.

2 MR. KERN: Okay. Because then --

3 MR. PALMISANO: And confirm if they're still  
4 active.

5 MR. KERN: Camp Pendleton has -- do they have  
6 seismic monitors?

7 MR. CAUGHLAN: I have to --

8 MR. KERN: That's why I asked if you can find  
9 out for us to do that. I know the City of Oceanside  
10 has two and we have two fire stations that have seismic  
11 devices that I think CalTech monitors or somebody  
12 monitors there. So I don't know about San Clemente or  
13 their fire station, but I know we have them. So I was  
14 just --

15 MR. PALMISANO: There's plenty of data that  
16 would tell us if something occurred, yeah.

17 MR. KERN: Because we were talking about  
18 ground motion if something happens and they have a  
19 device on site, you can say, okay, we had a 4.2 here  
20 and it actually got to the site and it's like a 1-foot  
21 ground acceleration or something like that.

22 MR. PALMISANO: Right. Yeah.

23 MR. KERN: So you can extrapolate that data  
24 with small earthquakes, so we know. That's fine.

25 CHAIRMAN DR. VICTOR: Okay. Thank you very



1 much. We're going to take -- I want to thank Neal and  
2 thank Tom. We're going to take a five-minute break and  
3 then we're going to come back. We have a few important  
4 updates about the CEP and consolidated storage and then  
5 we're going to go to the public comment period.

6 (Break taken from 7:23 p.m. to 7:29 p.m.)

7 CHAIRMAN DR. VICTOR: Sorry. This is just a  
8 very busy meeting. There's a lot to cover. And sorry  
9 for being a difficult taskmaster.

10 But first I want to just give a little bit of  
11 an updated on consolidated interim storage. We're  
12 going to talk in just a moment about topics for future  
13 CEP meetings of which this will be high on the list for  
14 the next meeting.

15 But I just mentioned that, in January,  
16 Congressman Issa introduced -- reintroduced HR474 into  
17 the House of Representatives. He's cosponsor on  
18 this -- this legislation. There's other related  
19 legislation pending in the senate, in particular, on  
20 the appropriation side.

21 We're following this pretty closely. We've  
22 reached out to staff here locally and in Washington to  
23 make sure they're aware of all work and also the key  
24 interest here in these communities around making  
25 responsible consolidated interim storage actually work.

1 Congressman Issa and others were at the plant recently.  
2 It was reported in the press last week.

3 I also want to mention that when this Panel  
4 has spent time looking at consolidated interim storage,  
5 we have become concerned that there's a lot of focus on  
6 making consolidated interim storage work, that means  
7 finding sites, currently in Nevada and West Texas, but  
8 maybe others, finding sites and not enough attention to  
9 how you do the whole chain responsibly, including  
10 transportation, which is vitally important.

11 We thought it was very important that the  
12 State of California, in particular, get itself  
13 organized around these issues and, perhaps, in  
14 conjunction with other western states that have common  
15 interest in this area, certainly California is  
16 interested in this, is going to go up as Diablo Canyon  
17 goes into decommissioning and so on.

18 At our last meeting the Panel discussed the  
19 need for the leadership of the CEP to send the letter  
20 to the California Energy Commission, to Chairman  
21 Weisenmiller. We did that on December 12. We  
22 circulated that to the CEP. We have followed up with  
23 them by email and we will continue to follow up.

24 The idea is to both working, with the CEC and  
25 with the California legislature, to get the CEC to help

1 organize California's position in this area and make  
2 sure that what we do here is responsible, not only for  
3 the people of California, but also for the communities  
4 that are affected by -- by consolidated interim  
5 storage.

6 I want to see -- maybe, Jerry Kern, in  
7 particular, presenting, you want to say in terms of  
8 updates on our outreach efforts on consolidated interim  
9 storage.

10 MR. KERN: Next week, the Chairman and I and  
11 Manuel Camargo are going to meet with sen --  
12 Congressman Peters to kind of press our case about  
13 consolidated interim storage.

14 And so we've been meeting with local elected  
15 officials. I've had a couple of meetings with Pat  
16 Bates or Rocky Chavez, our local elected, about start  
17 thinking about the transportation plan. Because that's  
18 the next big thing, is the transportation plan.

19 So, you know, I don't want to go station to  
20 station. We need to start doing things in parallel.

21 CHAIRMAN DR. VICTOR: Yes. And I've reached  
22 out to the new leadership, such as it exists in the  
23 Department of Energy, to make sure they're aware of  
24 what we're doing. And they've been out here before,  
25 they know about our active involvement.

1 Tom Palmisano, I see that you were looking for  
2 the floor.

3 MR. PALMISANO: Yes. Just -- just a couple of  
4 comments. Good host, our Congressman Issa, and  
5 Congressman Shimkus from Illinois, both have important  
6 subcommittee -- subcommittee positions in congress  
7 related to moving consolidated interim storage to a  
8 reality.

9 We -- I've been in touch with the com -- both  
10 of the companies, Waste Control Specialist in Texas,  
11 whose license request has been accepted by the NRC for  
12 review, and Holtech, who intends to submit their  
13 license request in March time frame, and I'll be in  
14 Washington in March, meeting with congressional and  
15 senatorial staffs on the issue of federal action on  
16 consolidated interim storage.

17 CHAIRMAN DR. VICTOR: That's great. Thank you  
18 very much. Briefly, Glenn Pascall.

19 MR. PASCALL: As you know, the Sierra Club  
20 supports consolidated interim storage and we're very  
21 pleased to present a statement for use by Jerry.

22 And just in the last couple of days, there's  
23 new public polling data, huge support for -- for  
24 permanent storage facility, developing that.

25 And we believe CIS and permanent storage are

1 part of a consolidated solution to integrated waste  
2 management on the nuclear front and these are  
3 encouraging signs. Huge public support for an  
4 end-solution, but also widespread activity for an  
5 interim solution.

6 CHAIRMAN DR. VICTOR: All right. Thank you  
7 very much. In the past years, it has been attributed  
8 to Congressman Shimkus that he would accept only a  
9 permanent solution, namely Yucca mountain.

10 I believe that that's actually not his view,  
11 that he sees that the politics in this area require  
12 both those pieces to be put together, responsible  
13 consolidated interim storage and permanent storage  
14 facility, which is code for Yucca mountain, but it  
15 doesn't necessarily have to be. Okay.

16 I want to see. Anything else on that topic?

17 Next slide, please.

18 I just want to thank Bill Parker, who has been  
19 on the CEP from the beginning, from  
20 University California, Irvine. He's really helped us  
21 enormously on a number of important technical topics.

22 And he's not here tonight. I'm sure he's  
23 watching at home with his family, next to the  
24 fireplace.

25 And I want to thank you -- thanks, Bill, for

1 all that you -- that you did for us.

2 Next slide.

3 So this is a tentative list that has been  
4 developed by the leadership of the CEP, which is our  
5 duty in the charter, and also the leadership of Edison,  
6 because Edison convened the Panel on CEP meetings going  
7 into the future.

8 The probability that this is exactly the topic  
9 goes down as you go down the list, so it's highly  
10 likely that our next meeting on May 11 is going to  
11 focus on consolidated interim storage and we're going  
12 to try to get both the vendors out here along with the  
13 folks from the Bipartisan Policy Center.

14 You may remember they were out here a year or  
15 so ago, helping us understand what's going with the new  
16 consent-based process as well as the Nuclear Regulatory  
17 Commission. It's going to be a very busy meeting.

18 After that, we promised, on a regular basis,  
19 to come back and focus on Defense-in-Depth and how do  
20 we know that the spent fuel being stored in the ISFSI  
21 is being stored safely and there's -- and there's a  
22 proper management system there and what does that look  
23 like, and that's still coming into focus, but that's  
24 the likely topic there.

25 We'll see whether the Navy is ready to talk

1 with us. Tom Caughlan and others have been very  
2 helpful in that regard, to understand a little bit  
3 about what the site might look like at the end of the  
4 decommissioning process, which is sometime down the  
5 road. Indeed, I want to pause for a moment and see if  
6 there are any comments about this.

7 Tom Palmisano.

8 MR. PALMISANO: Let me make one comment: As I  
9 mentioned in my slides, we'll be in the -- we expect  
10 the State Lands Commission to issue the Draft  
11 Environmental Impact Report in June-July time frame.

12 So, certainly, probably, as we look at the  
13 August to October meeting, that may be appropriate,  
14 probably more appropriate than talking about the Navy  
15 end-state. That may be a bit premature.

16 And, again, I want to make sure it's  
17 transparent to the public the State Lands Commission  
18 will post that for public comment in that time frame.

19 CHAIRMAN DR. VICTOR: Yeah. And we'll have to  
20 see how the other public engagement processes are going  
21 because if -- if the other regulatory agencies are  
22 doing extensive public engagement, we don't need to do  
23 it just for the sake of public engagement.

24 MR. PALMISANO: Right.

25 CHAIRMAN DR. VICTOR: We should -- we should

1 focus on the places of greatest leverage and impact.

2 Pam Patterson.

3 MS. PATTERSON: So when is the community going  
4 to be able to participate in this discussion? That's  
5 what we discussed two meetings ago.

6 So I don't see that on the list of upcoming  
7 topics and it is absolutely imperative that that take  
8 place because the community has concerns that are not  
9 being addressed and each meeting, basically, the  
10 community is being ignored.

11 I'm sure they get their three minutes, but  
12 they don't get to -- there is no dialogue. You talk  
13 about dialogue, but it doesn't take place.

14 So when is that going to take place?

15 VICE CHAIRMAN BROWN: Before you respond, what  
16 community? Because my community doesn't reflect your  
17 community. So, you're talking San Juan Capistrano? Is  
18 that what you're referring to, your city?

19 MS. PATTERSON: No. Actually, there's a  
20 larger community that --

21 VICE CHAIRMAN BROWN: So you're speaking for  
22 my community?

23 MS. PATTERSON: Oh, I would -- well,  
24 certainly --

25 VICE CHAIRMAN BROWN: And Oceanside?



1 MS. PATTERSON: Where are you from?

2 VICE CHAIRMAN BROWN: And then Jerry's  
3 community as well?

4 MS. PATTERSON: Where are you from?

5 VICE CHAIRMAN BROWN: Where am I from?

6 MS. PATTERSON: Yeah, what city?

7 VICE CHAIRMAN BROWN: If you don't know the  
8 answer to that, I question your fitness for this Panel.

9 MS. PATTERSON: San Clemente?

10 CHAIRMAN DR. VICTOR: Okay. Let's -- folks?  
11 Folks?

12 MS. PATTERSON: Yes, we absolutely have  
13 members from San Clemente that are -- yeah.

14 VICE CHAIRMAN BROWN: That's wonderful.  
15 Mr. Kern is from Oceanside. Do you speak for his city  
16 as well?

17 MS. PATTERSON: I'm not saying -- I'm talking  
18 about the community. I'm not speaking for a city.

19 VICE CHAIRMAN BROWN: Which community? Which  
20 community?

21 MS. PATTERSON: The community of the people  
22 that are concerned about this situation.

23 VICE CHAIRMAN BROWN: Wonderful.

24 CHAIRMAN DR. VICTOR: Folks?

25 VICE CHAIRMAN BROWN: Wonderful.

1 MS. PATTERSON: Yeah. Thank you.

2 CHAIRMAN DR. VICTOR: This back and --

3 MS. PATTERSON: I'm glad you think it's  
4 wonderful.

5 VICE CHAIRMAN BROWN: That's really great.

6 CHAIRMAN DR. VICTOR: Okay. Great. Okay.

7 VICE CHAIRMAN BROWN: So I'm interested to  
8 hear what San Juan Capistrano has to say.

9 MS. PATTERSON: That is great. You're  
10 absolutely --

11 CHAIRMAN DR. VICTOR: Can we -- can we move on  
12 to the public comment period? Will that be okay?

13 VICE CHAIRMAN BROWN: Oh, I'd love to.

14 MS. PATTERSON: Well, I'd like a response so  
15 with respect to that.

16 CHAIRMAN DR. VICTOR: But I think, Pam, the  
17 idea here is that all of these different communities  
18 are affected and so it's a difficult process to  
19 organize how dozens and dozens and hundreds and  
20 hundreds of people who are interested and engaged and  
21 want to hear about these issues and get involved, how  
22 do you organize that.

23 And so the way this has been organized is that  
24 representatives from lots of different communities that  
25 are overlapping in various ways are asked to serve as

1 volunteers in the Panel and to articulate the views of  
2 that community, and then to -- (inaudible) -- comment  
3 period.

4           And then one of the things that I've learned  
5 in very helpful conversations with Garry Headrick is  
6 that on some of these very technical topics where  
7 there's, you know, mountains and mountains of documents  
8 and it's hard to know what's going on, we need to find  
9 a way to organize and articulate additional questions  
10 from the community.

11           And so I drove up a couple of months ago and  
12 spent -- sat down with Garry to work on that process  
13 and he has very helpfully put out a draft of some  
14 questions that he's trying to help us get answers to.

15           Dan and Tim and I have committed to make sure  
16 that they're answers -- they're organized answers so  
17 that we can help engage with the community. So I  
18 don't -- I don't think that we're talking about a  
19 process that is somehow squelched in the community.

20           Jerry Kern?

21           MR. KERN: Well, I have probably given at  
22 least 20 talks on San Onofre since this Panel started.  
23 On some of those talks, I've had Manuel Camargo, the  
24 manager, come with me. I have probably met with a  
25 dozen city councils. I have given several community

1 talks. The last Manuel came with me when we did the  
2 Concerned Coastal Community's group.

3 So we reach out and talk to communities. In a  
4 smaller -- (inaudible) -- I came and talked to your  
5 group down in San Diego. That -- we reach out and we  
6 talk. And so the idea of those small groups, we get  
7 those questions and then I relay them back to the Panel  
8 and those questions are answered for those people I  
9 meet.

10 And so I have never turned down an invitation  
11 to talk. I will come and talk to your city council, if  
12 you want, and answer those questions that we develop  
13 where people are concerned.

14 MS. PATTERSON: But you're -- you're missing  
15 the point. So this is called a Community Engagement  
16 Panel.

17 MR. KERN: And I go out, engage the community.

18 MS. PATTERSON: We're not engaging the  
19 community.

20 CHAIRMAN DR. VICTOR: Well, I'll tell you  
21 what --

22 MS. PATTERSON: They're not engaging the  
23 community.

24 MR. KERN: I don't know what you would call it  
25 if that's not called engagement.

1           CHAIRMAN DR. VICTOR:   Okay.   Folks?   Folks?  
2   Why don't we have public comment period because then we  
3   can get some additional -- additional views from the  
4   public?   First on the list is Vinot Arora and then Ed  
5   Schlegel.   Mr. Arora.   Vino?

6           This is a big list, so I do appreciate --

7                           PUBLIC COMMENT PERIOD

8           MR. ARORA:   Three minutes.

9           CHAIRMAN DR. VICTOR:   Yep.

10          MR. ARORA:   I will be out before that.

11          My name is Vinot Arora.   I'm a former  
12   San Onofre engineer.   And I'm pleased to be here.   And  
13   good evening, everybody in the Panel, ladies and  
14   gentlemen in the public.   I appreciate the opportunity.

15          My first comment is, when a panel member sees  
16   the community has some concerns and another panel  
17   members says "Which community?"   That is astonishing.

18          She's speaking for the public -- a person  
19   maybe from there, from there (indicating).

20          How can you challenge her right to speak in a  
21   public forum?   I'm sorry.   But that's my impression.  
22   Okay.   Now I will come to the second point:

23          We're all here because San Onofre closed.   We  
24   had a tube leak.   In my 5-year investigations reveals  
25   that the exact cause of tube leak has never been

1 disclosed. And all the parties -- NRC, Edison, and  
2 Mitsubishi are all greedy.

3 At this time I have a lot of evidence. But  
4 unless everybody speaks the truth, it's going to be  
5 impossible to see where it lies the fork. Okay.

6 Thirdly, I want to say we spent a lot of time  
7 discussing the seismic hazards. My experience is, as  
8 far as seismic and tsunami are concerned, there is very  
9 little risk to the ISFSI and the structure, and the new  
10 contractor, he -- whose I forget the names -- they  
11 would do a fine job in the solutions of decommissioning  
12 this plant. But I do have concerns about the ISFSI,  
13 the tin canisters and the structure itself.

14 The community's concern regarding corrosion of  
15 canisters and infiltration, exfiltration into the  
16 structure from the ocean and the ground order, they're  
17 being ignored and not addressed.

18 All these people are taxpayers. They're  
19 American citizens and they have a right to these -- to  
20 their questions. These must be answered. I don't say  
21 that you don't make profit. You make profit. But you  
22 also put emphasis on public safety and public money.  
23 Thank you very much.

24 CHAIRMAN DR. VICTOR: Thank you very much for  
25 your comment. Ed Schlegel and then Laurie Headrick.

1 MR. HEADRICK: Sorry. We had a change of  
2 order.

3 CHAIRMAN DR. VICTOR: Okay. So, Gary Headrick  
4 then --

5 MR. HEADRICK: Then Ed.

6 CHAIRMAN DR. VICTOR: -- Ed then Laurie.

7 MR. HEADRICK: Thanks. Hello, everybody.  
8 It's good to see a good turnout. I'm just curious, how  
9 many people are here in support of what San Clemente  
10 Green is trying to do? How many? Show of hands?  
11 Thank you so much for coming out. It really makes a  
12 difference.

13 So the questions that we assembled, I'm glad  
14 to have the opportunity to kind of consolidate them and  
15 make more progress, get some momentum going here in the  
16 right direction.

17 And I -- I also wanted to apologize for  
18 interrupting when Tom was speaking, because when he  
19 mentioned that the plant was designed for 7.0, long  
20 before he was on the scene or maybe he forgot was the  
21 plant was designed for a 6.0 and then, during  
22 construction, they decided to better upgrade it.

23 And I'm not sure how they do it when it's in  
24 construction, but there is a -- the difference between  
25 a 6.0 and 7.0, you can correct me if I'm wrong, it's

1 about 30 times the amount of energy.

2 So when you say that your system has been  
3 designed to withstand twice as much as what we expect,  
4 that just seems like I needed to say something about  
5 it.

6 Anyway, what we've seen as lay people, just  
7 concerned citizens, what's happened in Fukushima and  
8 how they underestimated the Tohoku 9.0, when they  
9 expected an 8. Well, in retrospect, what we find out  
10 is that sometimes experts are saying they expect an 8.0  
11 and others were saying 9.0.

12 And, you know, after it happened, the 9.0 guys  
13 went, but that's too late. And I just wanted to point  
14 out that -- you know, I'm sure Dr. Driscoll is  
15 super-qualified and he has very valid opinions,  
16 well-substantiated in science, but I also found an  
17 article from September 10 of 2014, it's called Advanced  
18 Seismic Research Confirms Earthquake Safety at Diablo  
19 Canyon and he was as part of that study.

20 And I just think it feels like, you know,  
21 you're playing it safe. And I'm so glad that you  
22 haven't found anything really frightening, but I'm glad  
23 you're confirming that.

24 Maybe there's not so much to worry about, but  
25 that's reassuring, but at the same time I want us to



1 make decisions on the worst-case scenario and really  
2 look at what's possible.

3 And just doing my own amateur research, I  
4 wanted to show you some slides -- if I can really make  
5 this work.

6 CHAIRMAN DR. VICTOR: No.

7 MR. HEADRICK: So, back?

8 TECH SUPPORT: Which one do you need?

9 MR. HEADRICK: Let's go with one.

10 CHAIRMAN DR. VICTOR: Why don't we pause the  
11 clock right here while we get ourselves in order here.

12 MR. HEADRICK: Thank you very much.

13 Oh, wow. 32 seconds.

14 CHAIRMAN DR. VICTOR: Hence, my interest in  
15 pausing the clock. Okay. Go ahead.

16 MR. HEADRICK: Thank you so much.

17 Okay. This -- this first exhibit shows USGS  
18 data there they thought the Rose Canyon Fault could  
19 produce a 7.5 to 8.0. It kind of shows the radius.

20 Next slide, please.

21 This shows the area where Dr. Driscoll was  
22 spending quite a bit of time and energy. But what I  
23 want to point out, these are just measurements I was  
24 able to take off of Google Earth and it shows this  
25 precipice.

1           If you look at that form of land above water,  
2 I'm sure you wouldn't want to be at the toe of that  
3 slow when the earthquake hits because it just looks to  
4 steep -- right? -- close to the plant.

5           But I would think whether there's a block  
6 moving south or moving north or whether this slip is  
7 sliding or, you know, thrusting. This is --

8           CHAIRMAN DR. VICTOR: Thank you very much.

9           MR. HEADRICK: Oh, wow.

10          CHAIRMAN DR. VICTOR: Yeah. And I'm sure that  
11 you'll be able to comment on some of this when we get  
12 to respond to the public comments.

13          MR. HEADRICK: Yeah, I brought it to your  
14 attention, so we could discuss it, but --

15          Wow. Three minutes. All right.

16          CHAIRMAN DR. VICTOR: Ed Schlegel and then  
17 Laurie Headrick.

18          MR. HEADRICK: So I just want to -- just in  
19 rough terms, that's a 700-foot drop right at that  
20 yellow line and it goes for 25 miles and if you --  
21 could you --

22          CHAIRMAN DR. VICTOR: Gary, please. Please  
23 bear with me. Okay.

24          MR. HEADRICK: You know, I appreciate your  
25 situation -- but could you just go back that one slide

1 of the mountain range? That's a 3-mile section, but we  
2 have a 25-mile section that could drop. That's the  
3 volume of earth that we're talking about could slide  
4 and I think that might exceed the 15-foot tsunami wall,  
5 and I think we should be conservative in our judgment.

6 CHAIRMAN DR. VICTOR: And we've shared this.  
7 And I'm sure Mr. -- Dr. Driscoll will be able to  
8 speak --

9 MR. HEADRICK: I'm sorry I didn't get to say  
10 more. I probably wasted some precious time.

11 CHAIRMAN DR. VICTOR: Ed Schlegel and Laurie  
12 Headrick.

13 MR. HEADRICK: I didn't get to use the  
14 pointer.

15 CHAIRMAN DR. VICTOR: Next time.

16 MR. SCHLEGEL: Good evening. My name is  
17 Ed Schlegel.

18 "If an earthquake or a tsunami damages the  
19 pool or pumps, mayhem will be a matter of hours before  
20 unprotected fuel assemblies overheat to the point where  
21 the zirconium cladding bursts into a fire that can't be  
22 extinguished with water."

23 "How long would it take to put out such a  
24 fire? How much radiation could be released in a  
25 worst-case scenario? How would you put it out? Do

1 they have the capability onsite now to deal with such  
2 an event?"

3 "The Inglewood -- the Newport Inglewood Fault  
4 appears to be connected to the Rose Canyon Fault coming  
5 up from San Diego. It seems that the likely breaking  
6 point is right at San Onofre. Following the contours  
7 of an underwater ledge that is over 700 feet tall and  
8 25 miles long -- the documents were provided in advance  
9 for this discussion -- how large could the wave be --"  
10 excuse me -- "from that much displacement if there was  
11 an underwater landslide?"

12 "How long would it take to reach San Onofre?  
13 How long can dry cask survive being submerged? Once  
14 breached -- once breached, would the seawall actually  
15 keep the site submerged longer? Would backup systems  
16 for spent fuel pools be able to survive such an event?"

17 "How long overdue is this area for having the  
18 next big earthquake or tsunami? When it was discovered  
19 that the USGS was now predicting the next big quake  
20 could easily exceed the 7.0 magnitude limitations at  
21 SONGS, Edison suddenly stopped referring to the Richter  
22 scale."

23 "Now they tell us what the plant can withstand  
24 in peak ground acceleration, but it is not clear how  
25 that compares to the Richter scale. If new evidence

1 points to even a remote possibility that there could be  
2 a catastrophic nuclear event coming from the long  
3 overdue earthquake, shouldn't Edison's plan have to  
4 take that into account right now?"

5 "If the SONGS facility was designed to  
6 withstand a 7.0, but could not get hit with an 8.0, but  
7 over 30 times -- is 30 times stronger, is the public  
8 expected to believe that we're within safe limits just  
9 because the threat is now expressed in terms of peak  
10 ground acceleration?"

11 "Can a slip-fault cause an underwater  
12 landslide just as easily as a thrust fault? Can a  
13 major earthquake cause a partially-buried dry cask to  
14 shift at their midpoint, resulting in then being lodged  
15 in the way that makes them irretrievable?"

16 "What would the eventual impact on Southern  
17 California if these casks can't be moved before they  
18 begin to fail? How severe would the impact be on our  
19 property values if there aren't any serious physical  
20 problems at San Onofre and how would we be  
21 compensated?"

22 "And lay -- last, can Dr. Driscoll explain  
23 what he thinks went wrong when seismologists that  
24 grossly underestimated the potential for the tsunami  
25 that resulted in the ongoing meltdown in Fukushima?"

1           CHAIRMAN DR. VICTOR: Thank you very much for  
2 your comment. Laurie Headrick and then Judy Jones.

3           MS. HEADRICK: Thank you for the opportunity  
4 to share these questions from the community.

5           "SONGS has the worst safety record in the  
6 nation and has had many close calls, including the leak  
7 that finally ended the operation of the plant."

8           "Whistleblowers have accurately predicted such  
9 things. And even with the plant shut down, still  
10 expressed concerns over improper handling of the spent  
11 fuel. One high-ranking employee recently claimed that  
12 the spent fuel assemblies that were thought to be  
13 intact may actually have experienced damage before  
14 being loaded into the dry cask."

15           "What would be the impact of an improperly  
16 loaded cask having a nuclear reaction in dry storage?  
17 How would such a cri -- crisis be dealt with? Why --  
18 why should fuel pools be destroyed as soon as they are  
19 emptied instead of when the last of the nuclear waste  
20 is actually relocated, making it possible to reload a  
21 damaged container, if needed?"

22           "In 2012, there was an unsolved case of  
23 sabotage to backup generators. In the near future,  
24 thousands of new employees will have access to this  
25 prime terrorist target. What came of the sabotage --

1 sabotage investigation?"

2 "What is being done to screen all employees  
3 that may wish to do us harm? Why is there no longer a  
4 no-fly zone at SONGS? Do we have the ability to shoot  
5 down an airplane that suddenly veers towards SONGS?  
6 Can we take down any weaponized drones that approach as  
7 well? Are the critical security systems, communication  
8 devices, pumps and control valves adequately protected  
9 from cyber attacks?"

10 "It is common knowledge that the dry casks  
11 were only designed as temporary nuclear waste storage  
12 containers. Now that there's nowhere to take the waste  
13 after 50 years of trying, we're told these containers  
14 are good for hundreds of years or longer, if that is  
15 what is needed."

16 "There's evidence that there are problems with  
17 half-inch stainless steel canisters cracking in as few  
18 as 17 years due to their exposure to our salty marine  
19 environment. Even Dr. Kris Singh, CEO of Holtech, who  
20 makes the nuclear waste containers, says they're known  
21 to crack and there's no practical way to repair them."

22 "They can only be placed in a larger cask as a  
23 temporary solution. It's not even clear if they can  
24 get close to work on them when, according to Dr. Singh,  
25 even a microscopic crack can emit millions of curies of

1 deadly radiation."

2 "They also lack any way to warn us of danger  
3 since they can't be inspected for damage after being  
4 welded shut. If we're lucky enough to escape harm  
5 while these canisters are still at San Onofre, how can  
6 we expect other communities to accept these hot  
7 potatoes when we are not even sure they are safe to  
8 move?"

9 "Do we currently have the resources on site to  
10 transfer a leaking cask to a larger cask, as  
11 recommended by Dr. Singh? Isn't it more logical to  
12 assume that these canisters would need to be relocated  
13 in better casters before they can be safely relocated  
14 for what would still be a rather long periods of  
15 interim storage?"

16 "Shouldn't we be building a facility to reload  
17 canisters in a sturdy structure that can prevent leaks  
18 from getting into the environment while also preventing  
19 terrorists attacks and intrusion of our salty air? Can  
20 we design better canisters that can be inspected,  
21 repaired, and more easily transported in smaller,  
22 cooler, less-conspicuous loads?" What --

23 CHAIRMAN DR. VICTOR: Okay. Thank you for  
24 your comment.

25 MS. HEADRICK: Okay.



1           CHAIRMAN DR. VICTOR:  If you could send me --  
2  I see that you're -- if you could send me that text,  
3  that would be great, so we make sure the entire text is  
4  part of the official record.

5           Thank you very much.  Judy Jones and then  
6  Angela Mooney D'Arcy.

7           MS. JONES:  Yes.  Thank you, Victor.  And --  
8  David Victor and the Panel and the community, behind  
9  me.  I'm Judy Jones, a board member of the Alliance for  
10 Nuclear Responsibility.  Russell sent a letter with  
11 some questions.

12          CHAIRMAN DR. VICTOR:  Which we circulated to  
13 the whole Panel.

14          MS. JONES:  And so I've given everybody a hard  
15 copy as well so -- in case I didn't do that.

16          And so I -- I just wanted more of the people  
17 here too to hear.  So I'm going to start with the  
18 questions so I don't get cut off there even though that  
19 was the second part.

20          "In the joint proposal to close the Diablo  
21 Canyon, PG&E agreed to a plan to continue the existing  
22 emergency planning activities, including maintenance of  
23 the public warning sirens, funding of the community,  
24 and statewide emergency planning functions until the  
25 termination of Diablo Canyon's 10CFR Part 50 license,

1 subject to CPUC approval and funding and  
2 decommissioning."

3 "Is SCE willing to make a similar commitment  
4 to one issued by PG&E for Diablo Canyon? And, if not,  
5 why? Has SCE conducted a poll of the IJP member  
6 organizations and the local governments they represent  
7 to ascertain their professional responses to SCE's  
8 proposed abduction of ongoing physical support for  
9 local off-site emergency services?"

10 Those are the two most important questions at  
11 the background I have references.

12 "And, first of all, the Oroville Dam disaster  
13 is a cautionary tale for the San Onofre nuclear plant.  
14 The relevancy is, the regulators and inspectors, for  
15 nearly a decade, have verified that the Oroville  
16 spillways were safe and functional."

17 "In spite of challenges from environmental and  
18 other groups that claimed otherwise Oroville. In spite  
19 of their claims that the spillways were secured, the  
20 consulates of heavy rains and failing infrastructure,  
21 risk assumptions that should've been modeled and  
22 anticipated, necessitated mass evacuations."

23 "The evacuations were rushed and chaotic even  
24 with the most diligent all-out efforts on the part of  
25 trained professionals and first responders."

1           "Second, there's a parallel too that this  
2 disaster is a risk posed by tsunamis. In 1964, an  
3 seismic seaway triggered by a massive earthquake in  
4 Alaska crashed into Crescent City, on the State's  
5 northwest coast, in the middle of the night, killing 11  
6 people. Residents said they had received no warning  
7 from officials."

8           Hopefully, we've improved since then.

9           "Our situation is, the siren system already in  
10 place for SONGS plant also -- also provides the only  
11 tsunami warning sirens for Southern Orange and Northern  
12 San Diego County."

13           "The nuclear Inglewood and Oceanside Blind  
14 Thrust faults all remain potential tsunami generators  
15 for Southern California with the possibility of  
16 inundating the radioactive waste storage at SONGS."

17           "Again, the Fukushima event was rated 1 in a  
18 million, but it happened."

19           CHAIRMAN DR. VICTOR: All right. Thank you  
20 very much.

21           MS. JONES: Thank you.

22           CHAIRMAN DR. VICTOR: And thank you also for  
23 the longer letter, which we've made a part of the  
24 official record.

25           MS. JONES: Right. So you'll have more.

1 Okay.

2 CHAIRMAN DR. VICTOR: Thank you very much.

3 Angela Mooney D'Arcy. Am I pronouncing your  
4 name correctly? And then Bob Pope.

5 MS. MOONEY D'ARCY: Yes, you are. We'll see  
6 if you can pronounce my tribe's name correctly.

7 So, Angela Mooney D'Arcy. I'm from the  
8 Acjachemen Nation, Juaneno Band of Mission Indians.  
9 You're in our ancestral territory right now. I'm also  
10 the Executive Director and Founder of the Sacred Places  
11 Institute for Indigenous Peoples; our mission is to  
12 build the capacity of native nations and indigenous  
13 peoples to protect sacred lands, waters, and cultures.

14 So I'm here to talk about the tribal  
15 perspective on this issue and, explicitly, to talk  
16 about the huge oversight on Southern California  
17 Edison's part.

18 The CEP Chairman said in response to one of  
19 the fellow panel members questions about community  
20 engagement that community engagement is a difficult  
21 process to organize, especially when dealing with so  
22 many different communities and perspectives and that  
23 one way to organize communities is by making sure that  
24 diverse perspectives and community voices are appointed  
25 to the CEP.

1           You'll note that there's no representation  
2 from Nat -- Nations on this Community Engagement Panel;  
3 that's absolutely unacceptable. There's state,  
4 federal, and international laws that explicitly require  
5 government-to-government consultation with native  
6 nations.

7           There may be -- with all due respect to the  
8 city representatives that are here, none of your cities  
9 come even close to the age of our village sites. Panhe  
10 and Acjachemen, which are our Southernmost village  
11 sites, which are directly across from the San Onofre  
12 Nuclear Power Plant, are estimated to be 10- to 15,000  
13 years old. Okay.

14           So it's absolutely unacceptable that when our  
15 communities that are functioning sovereign governments  
16 to which federal, state, and international  
17 government-to-government consultation obligations are  
18 required that there is no one from either of our  
19 Nations on this panel.

20           So our call to action here today is that the  
21 San Ono -- or, excuse me -- Southern California Edison  
22 absolutely needs to reach out to both the Acjachemen  
23 Nation and Juaneno Band of Mission Indians and The  
24 San Luis Rey Band of Luiseno Indians and invite  
25 participation on the Community Engagement Panel from

1 both of those nations.

2           You have two native nations, again, that have  
3 been there with villages that continue to thrive and  
4 have active political governments in our sovereign  
5 nations that have been there for 10- to 15,000 years,  
6 according to archeological evidence.

7           It's unacceptable that we've not been involved  
8 in this process so far. And, in fact, I think it's  
9 likely a violation of state and federal law because,  
10 again, tribal consultation is required anytime there's  
11 likely to be impacts to -- to traditional, cultural  
12 sites or villages.

13           It's highly likely that when you're talking  
14 about decommissioning nuclear power plants and what's  
15 going to happen regarding storage of nuclear -- of  
16 nuclear waste, that that's likely to impact our site.

17           Particular when, as I mentioned, Acjachemen,  
18 which is our southernmost village site, it didn't stop  
19 at the Pacific Coast Highway. The Pacific Coast  
20 Highway is there now.

21           And so, you know, we don't have access to all  
22 of that territory. But, certainly, you know, we all  
23 understand and want to live by the coast and so it's  
24 likely that our village actually included the  
25 San Onofre Nuclear Power Plant.

1           So, again, our call is, you need to engage in  
2 government-to-government consultation and invite  
3 representatives from the Acjachemen and Luiseno Nations  
4 to serve on this panel. Thank you.

5           CHAIRMAN DR. VICTOR: Excellent. Thank you  
6 very much for your comment. And thank you also for  
7 being here tonight. Thank you.

8           Bop Hope and then Nina Babiarz.

9           MR. HOPE: All right. Thank you very much.

10          Dr. Victor, thank you for the work you're  
11 doing here on the panel. Tim Brown, thank you for  
12 asking geology questions -- I appreciate that -- from  
13 the Panel. And, Dr. Driscoll, thank you for your work.

14          I have a number of technical questions, but  
15 right now I am just going to ask a couple of yes-no  
16 questions given the time frame: Would you make  
17 yourself available for a technical Q&A session in the  
18 upcoming weeks? "Yes" or "no."

19          CHAIRMAN DR. VICTOR: So why don't you ask  
20 your questions and then we organize it? And rather  
21 than ping-pong, why don't ask your questions and then  
22 we will make sure we get answers to the questions at  
23 the end?

24          MR. HOPE: Okay. And then so my second yes-no  
25 question is: Are data and calculations for your

1 already published reports currently available and where  
2 can I get that? And then, I've got a number of other  
3 technical questions that I will table for later.

4 But for, Tom, I'd like to ask you, dry cask  
5 storage systems are designed for 1.5 PGA horizontal and  
6 one vertical. We've learned that these casks can  
7 become degraded over a period of time, in one or more  
8 different ways, and that's been proven in applications  
9 in other locations around the world.

10 Have you calculated PGAs for the dry cask  
11 storage system using various degradation assumptions?  
12 And do the Edison engineers ever use PGVs for their  
13 engineering calculations instead the PGAs? So --

14 CHAIRMAN DR. VICTOR: Okay. Great. Thank you  
15 very much for your comment. And we'll get answers  
16 tonight to what we can answer and, also, other more  
17 technical questions we'll also make as part of the  
18 public record with answers.

19 MR. HOPE: All right.

20 CHAIRMAN DR. VICTOR: Which is our normal  
21 process. Great. Thank you very much.

22 MR. HOPE: Great. Thank you, Dr. Victor.

23 CHAIRMAN DR. VICTOR: Nina Babiarez and then  
24 Charles Langley.

25 MS. BABIARZ: Well, good evening.



1           My name is Nina Babiarz. I'm board member  
2 with Public Watchdogs. And as Dr. Driscoll indicated a  
3 little earlier, we -- we don't have a crystal ball. We  
4 can't predict an earthquake or a tsunami.

5           So I'd like to take this Panel back to the  
6 original Edison application for the California Coastal  
7 Commission permit to bury the nuclear waste at  
8 San Onofre State Beach Park and in that application as,  
9 I think, Matt Marston presented in November, Edison  
10 indicated that there was -- they did not have the  
11 technology.

12           I believe, in November you presented that  
13 technology for an aging management system to monitor  
14 these casks was still being developed. And this  
15 committee, this Panel needs to revisit that California  
16 Coastal commission permit because that permit was  
17 granted under special conditions and special condition  
18 number 2 indicated that it was required. It wasn't a  
19 wish list. That it is required that Edison have a  
20 developed -- be able to implement an aging management  
21 system.

22           And if that's not possible or feasible right  
23 now, then this committee should be going back to the  
24 California Coastal Commission and revoking that permit  
25 until that technology is developed.

1           So I'd like to see on that May 11 board CEP  
2 meeting agenda, Dr. Victor, where you have, I believe,  
3 May 11 you have interim storage, that the aging  
4 management system be part of that agenda, and we need  
5 an update on that aging management system.

6           Does it exist or not? Are we going to be able  
7 to see what's going on with those casks if we have an  
8 earthquake, the unanticipated? And so that's what I'd  
9 really like to urge for the May agenda.

10           I'd also like to -- I know at the last meeting  
11 you indicated you liked factual information, so I am  
12 going to address two definitions. The term unavoidable  
13 radioactive nuclear incident has come up. So I went  
14 back to the dictionary and -- and poured the word avoid  
15 out; it means to prevent something from happening.

16           And so if Edison, the NRC, the California  
17 Coastal Commission can't explain how something is going  
18 to be prevented from happening, then I think we have to  
19 conclude that it's unavoidable.

20           And, finally, since I have 26 seconds left,  
21 and this is the Community Engagement Panel, that the  
22 definition of engagement is a promise or a commitment  
23 and I think that promise has been broken and I don't  
24 think the commitment has been kept.

25           CHAIRMAN DR. VICTOR: Okay. Thank you very

1 much for your comment.

2 Charles Langley and then Doug Applegate.

3 MR. LANGLEY: All right. My name is Charles  
4 Langley. I'm the Executive Director of Public  
5 Watchdogs. And I have a seismic question and I also  
6 have a safety question. It's the same question and  
7 it's based on the fact that these casks are -- my  
8 understanding is they're extremely heavy. They can  
9 weigh up to 500,000 pounds. They're made of steel  
10 that's 5/8s of an inch thick.

11 And from what I've been able to read from  
12 Nuclear Regulatory Commission materials, one of the big  
13 fears about cask safety is if they're dropped, if  
14 they're dropped as much as an inch because if you drop  
15 a 500,000-pound cask an inch, there is a possibility it  
16 can break open and crack.

17 And that brings us up to seismic safety. I  
18 mean, obviously moving the cask is incredibly  
19 dangerous. But we're storing these casks in a tsunami  
20 zone, in a earthquake zone, and they're inside -- my  
21 understanding too, correct me if I'm wrong, is they're  
22 inside silos and there's space around the side of the  
23 cask and the silo because they have to cool off because  
24 these things can come out of the pool as hot as 750  
25 degrees. So there is space around them so they can

1 cool.

2 So, what happens in an earthquake when you got  
3 a 500,000-pound cask potentially tipping in either  
4 direction? What happens when they're inside a concrete  
5 silo that I understand isn't reinforced with steel  
6 rebar? It's just concrete. What happens if one of  
7 those cracks and bumps into the cask?

8 What kind of PGA would create those sort of  
9 forces? And what kind of an earthquake on the Richter  
10 scale could potentially break open one of these casks?

11 And I ask the question because, although I  
12 know everyone on the Panel is absolutely committed to  
13 public safety, Southern California Edison doesn't have  
14 a particularly good record of obeying safety  
15 regulations.

16 In fact, I've -- I've looked at a lot of Binot  
17 Arora's research. He was just speaking. And he's --  
18 he's documented a significant number of safety  
19 violations that actually resulted in the failure of a  
20 nuclear steam generator that was supposed to last 40  
21 years, failing, I believe, in as little as 11 months.

22 So I think the community has a right to ask if  
23 Edison has been doing its due diligence in terms of  
24 safety. Thank you very much.

25 CHAIRMAN DR. VICTOR: Okay. Thank you very

1 much. And just as we're waiting for Doug Applegate to  
2 come out, I just want to clarify that the next meeting  
3 about consolidated interim storage is about the idea of  
4 moving the canisters to some interim location and the  
5 meeting after that is about Defense-in-Depth, which is  
6 what this term -- this committee has been calling the  
7 aging management system. So just to clarify when these  
8 issues are going to be addressed in much more depth.

9 Doug Applegate, the floor is yours. And then  
10 Roger Johnson.

11 MR. APPLGATE: Thank you very much.

12 I'm Doug Applegate. I'm a retired marine  
13 colonel. I'm an attorney. I've lived up and down from  
14 Laguna Beach to Downtown San Diego since I first was at  
15 Pendleton in 1977.

16 And one thing that I -- that I want to thank  
17 everybody that's here about the scientist and the  
18 scientific method and peer-review articles and, most  
19 importantly, all the local government off -- officials  
20 because I know you've got a tin cup week coming up back  
21 on Capitol Hill, that's why I'm here to talk about  
22 that, because I think that what we have to recognize is  
23 that this needs to be a bipartisan effort.

24 Community outreach like this is wonderful.  
25 However, nothing's going to happen as far as what

1 sounds to be -- what seems to be everybody's goal here  
2 and that is interim and permanent storage away from  
3 SONGS. That -- that's where people like Jerry Kern  
4 come in when -- you guys are going to be walking the  
5 halls of Congress.

6 We're going to need a vote in Congress to move  
7 anything. The bill, as it is right now, 4 -- HR474  
8 that hasn't even been -- I'm not going to say scored,  
9 that's not the right term, but it hasn't even gone over  
10 to what is left of DOE, Department of Energy.

11 And what I would implore all of the local  
12 officials, because everybody is trying to get to the  
13 same place, but it's not going to get done here.  
14 Community outreach is very important. But you have to  
15 make your members of Congress listen to you.

16 You have to show up and you have to make sure  
17 that you get an appointment and you get an audience  
18 because that's where it's going to happen. It's going  
19 to happen in Congress and nothing's really going to get  
20 moved until Department of Energy gets involved.

21 Now, all of this discussion here can make this  
22 feel better or make this feel frustrated, but it starts  
23 -- really starts in Congress.

24 So I'm going to wish all the local officials,  
25 particular Jerry -- even though I live in San Clemente

1 now, you know, I consider Oceanside my second home --  
2 and all the rest of the local officials that are going  
3 to go up to Congress.

4 But democracy -- for democracy to work,  
5 citizens need to get involved and that's what I implore  
6 all of us to do from this day forward until we get an  
7 interim storage and a permanent storage for the nuclear  
8 material at SONGS that needs to be away from the beach  
9 and the best surfing spot in Southern California.

10 Thank you very much.

11 CHAIRMAN DR. VICTOR: Okay. Thank you very  
12 much. And I think you've just volunteered to help us.

13 So, thank you very much for that volunteering.

14 Roger Johnson and then Marni Magda.

15 Where did Roger go?

16 SECRETARY STETSON: He was here. I think he  
17 went --

18 MR. JOHNSON: I'm Roger.

19 CHAIRMAN DR. VICTOR: That show -- "I'm the  
20 Roger Johnson." Nice to see you tonight, Roger.

21 MS. MAGDA: I guess we just lost Roger.

22 CHAIRMAN DR. VICTOR: Marni Magda.

23 MS. MAGDA: Thank you. Marni Magda.

24 Thank you, everyone tonight. I just  
25 congratulate this system. Congratulations. Since

1 2011, so many of us have been involved in the changes  
2 that are happening and it's exciting to see.

3 We once had a 7.0 considered an adequate  
4 safety for future -- for San Onofre for safety. It was  
5 adequate to -- against the 7.0. We now have dry  
6 storage that's going to be protected at a 7.5. That's  
7 success of all of us pushing hard to move forward and  
8 make things work. And I ask everyone to stay involved.

9 A 7.3, a 7.4 is too close for worst-case  
10 scenario fear. We've got to keep pushing even though  
11 we're glad to hear some of the good news. We can't  
12 rest. We've got to get this fuel out of here. We've  
13 all got to join together and get HR474 passed.

14 We've got to get -- call everybody that you  
15 know, get every congress person. It's a bipartisan  
16 bill, equal democrats and equal republicans are  
17 sponsoring it. We've got to push forward.

18 It makes stranded fuel moved first. And it  
19 starts to use our government -- our money that we've  
20 already paid the government in order to pay for our  
21 fuel to be moved.

22 I ask all of you to look into consolidated  
23 interim storage private -- two private locations, in  
24 Texas and New Mexico. They are being built. And what  
25 Tom Palmisano has promised us, Southern California



1 Edison wants that fuel out of here. We want that fuel  
2 out of here. It has to get out of the pools first.

3 Let's get it out of the dangerous pools and  
4 then let's all work to get the legislation, that it  
5 will get on those trains and get to Texas in 2021 and  
6 to New Mexico in 2025, and we can be ready for that if  
7 all of us work together.

8 And we already have someone like Mike Langler  
9 at the DOE that can give you the web triggers  
10 information on how it moves. Right now we move fuel  
11 all over this country that's dangerous. And they know  
12 how, they have predictions, they'll help you understand  
13 it.

14 And I have learned that many of our  
15 congressional members don't know any of this. They  
16 don't understand that we've got to put it in out of --  
17 into dry storage before we can move it.

18 And if they don't understand that we're  
19 talking about a system that's already being used in the  
20 country and that we can make this happen right now with  
21 what we already have, I ask everyone here to contact  
22 Congress, make sure that you go after and --

23 And the DOE, very quickly, one other thing we  
24 have to do is contact our DOE to make sure that they,  
25 on their preliminary evaluation, puts SONGS as part of

1 the group that is going to be moved with the 14 -- the  
2 13 shutdown sites. Thank you. Give you more -- from  
3 this.

4 CHAIRMAN DR. VICTOR: Thank. Thank you very  
5 much. And if you wouldn't mind sending me a letter  
6 about that issue, that would be very helpful so I can  
7 get the Department of Energy to tell us what's going on  
8 there. Ray Lutz and then Torgen Johnson.

9 MR. LUTZ: Hello. Ray Lutz with Citizens  
10 Oversight. First, I'd like to suggest, in order to  
11 make our life better out here, to the public, is to  
12 allow us to have refreshments. You guys bring it in  
13 for yourself. I know SCE makes 27 million dollars to  
14 conduct these things. Even the local churches have  
15 refreshments for their attendees. So, please let's fix  
16 that.

17 Thank God this plant has shut down. That's  
18 what I've got to say. I mean, the seismic risk has now  
19 proven to be significant here. What I heard today is,  
20 based on new procedures, that they have these new  
21 theories about what might happen, but, of course,  
22 there's no way to test it. You have to wait maybe  
23 thousands of years to make the test to see if your  
24 theories are right.

25 And over and over we see the seismic people

1 have been wrong. They say the seismic risk here is  
2 this. Then they get an earthquake, instead of a 6,  
3 it's and 8 or a 9. Oh, we're changing now.

4 Because, guess what? Because even the seismic  
5 plate theory, Tectonic Plate Theory was only like 1962  
6 or something. It's very recent. This is -- this is a  
7 whole field that is just getting used to it.

8 So even though I'd love to see the  
9 presentation, the only thing is, we've got to go away  
10 from this is that the predictions is -- is  
11 unpredictable, the risk is significant.

12 But the worst risk here is the terrorist  
13 threat which -- and the Generic Environmental Impact  
14 Report said was unknown but small, unknown but small.  
15 That's a good way to work your way around it.

16 Now, we know that this board here is not a  
17 governmental body. It does not make decisions. This  
18 is not a public engagement place. This is not part of  
19 our democracy. This is part of Southern California  
20 Edison's attempt to control the situation, for their  
21 benefit. Let's be true about this.

22 People may be up there and say, "I'm  
23 representing my city." Bologna. There's not  
24 representation here because this is not a  
25 decision-making body. You can't represent here.

1           The only thing really going on here is the  
2 lawsuit. Citizens Oversight is the Plaintiff against  
3 the Coastal Commission. We're going to hopefully stop  
4 the construction of this ridiculous block of concrete  
5 on the beach. March 30th is our next hearing.

6           This was not adequately studied before it was  
7 put in. I doubt this is the best place for this ISFSI.  
8 It may be that -- everyone says, yeah, the seismic risk  
9 is 7.5, but still a good place. I doubt that it is.

10           So, please, I suggest everybody here who  
11 doesn't want it here join with us to try to block  
12 Southern California Edison from this ridiculous move.

13           Thank you.

14           CHAIRMAN DR. VICTOR: Okay. Thank you very  
15 much. Torgen Johnson and then Kevin Higgins.

16           MR. JOHNSON: Torgen Johnson, concerned parent  
17 of four children down in San Onofre and a  
18 Harvard-trained urban designer, connecting dots for  
19 you.

20           I think you all handed or at least emailed  
21 this study this afternoon. It's a study that's been  
22 circulated for a while and it questions the wisdom of  
23 siting fuel down at sea level right here in North  
24 County San Diego.

25           And what this is, it's called Paleoseismic

1 Features as Indicators of Earthquake Hazards in North  
2 Coastal San Diego County, California U.S.A., published  
3 in Engineering Geology in 2005.

4 This research went on for years prior to that  
5 2004 earthquake and tsunami in Indonesia that we all  
6 saw for the first time what a tsunami looks like, with  
7 high-def video.

8 What that tsunami taught all of us -- and then  
9 the one in Chile in 2010 and then the one in Fukushima  
10 in 20 -- why are you shaking your head? We need to --  
11 we need --

12 CHAIRMAN DR. VICTOR: I'm asking what the  
13 study is.

14 VICE CHAIRMAN BROWN: You're referencing a  
15 study we don't have.

16 MR. JOHNSON: That was emailed to everybody, I  
17 believe.

18 CHAIRMAN DR. VICTOR: No, we received this. I  
19 wrote to Charles Langley a couple of times and today we  
20 received this study. Is this the same study that  
21 you're talking about, sir?

22 MR. JOHNSON: No. This is Paleoseismic  
23 Features.

24 VICE CHAIRMAN BROWN: We don't have it.

25 MR. JOHNSON: Okay. I don't want to waste

1 time. I'm going to -- I'm going to just say very  
2 quickly, we have tsunami evidence here in north County  
3 San Diego and it's well-published, well-documented.

4 This research has been going on for decades  
5 and that same evidence, type of evidence, was found  
6 around Fukushima by a man named Koji Minoura.

7 Paleoseismic evidence of tsunamis 6 kilometers back  
8 into the rice field around Fukushima was ignored for 20  
9 years just as it's being ignored here.

10 It was ignored up until the Fukushima disaster  
11 and then he was called and they said, "What can we do  
12 about it?" He said, "It's too late."

13 I went to a San Diego Associate of Geologists  
14 meeting in Carlsbad in 2013 and raised the issue.

15 Edison was there, presenting their safety issues and  
16 trying to get some sort of feedback from the  
17 geologists. There was no consensus on the seismic  
18 risk. But I want to say, if you look at science the  
19 way I do, David Victor, science is an evolving view of  
20 reality. It's not concrete.

21 Recent test borings along the northern part of  
22 the Newport Inglewood/Rose Canyon Fault line, up in the  
23 L.A. area, found helium isotopes emanating from the  
24 test borings and they said there's only place where  
25 helium of that volume exists and it's down in the

1 mantle of the earth.

2           So there is now discussion about this fault  
3 line, which was thought to be pieces, is now, not only  
4 connected, but 60 miles deep, which, if you look at the  
5 paleoseismic evidence of tsunamis in North County  
6 San Diego, you can quickly connect a couple of dots and  
7 say we've got a very serious seismic condition here  
8 that we've just never seen before because all the world  
9 histories that would've recorded this don't exist.  
10 We've only been here a few hundred years. But this  
11 thing is a recurring event. From the evidence, it  
12 shows it's a reoccurring event.

13           I want to just finish up by saying one thing,  
14 Nelson Mar, who designed the domes at San Onofre,  
15 testified, he spoke in Irvine, California, in 2013, he  
16 said -- he said when he watched the Fukushima disaster,  
17 he was horrified. He said the plant should be shut  
18 down immediately. The plant was never designed for  
19 these types of forces.

20           We're about to put all the fuel from its whole  
21 operation down at sea level, in a tsunami zone, where  
22 there's tsunami evidence, next to a huge fault where  
23 that they're now discovering could be 60 miles deep.  
24 Just think about that. The point of the citizen  
25 engagement panel is not to be cut off at three minutes,

1 it's to share information because we're all in this  
2 together.

3 CHAIRMAN DR. VICTOR: All right. And we're  
4 trying to do that. Thank you very much for your  
5 comment.

6 MR. JOHNSON: Yeah.

7 CHAIRMAN DR. VICTOR: Kevin Higgins and then  
8 Tom White, I believe or, Whiten. Kevin Higgins.

9 MR. HIGGINS: I don't think I can be as  
10 thorough as everyone else. My daughters golf, son  
11 soccers, so, sorry about the way I'm dressed, but  
12 that's just the way it is.

13 I just want to know, is anybody on the Panel  
14 been through an earthquake? Anybody? Okay. How big  
15 was it?

16 CHAIRMAN DR. VICTOR: Why don't you please  
17 make your comment? And --

18 MR. HIGGINS: Okay. Northridge earthquake.  
19 I'm sitting inside the bedroom. All of a sudden, it  
20 hits like that: Boom -- buildings are crumbling,  
21 things are on fire. I tried to get to my dad's house  
22 in Santa Monica, approximately, I think, 20-25 miles  
23 away.

24 I'm just trying to make the point. The  
25 freeways crumbled. We're talking concrete, everything.



1 Right? I'm just curious to know -- like, watching the  
2 sky -- I haven't been to one of these meetings in a  
3 long time. You've got nuclear waste that's stored  
4 with -- I don't know -- 8.4 million people and there is  
5 a risk that I see that it is -- it's amazing.

6 It's, like, there shouldn't even be  
7 discussions. This stuff should be gone. If you lived  
8 through the Northridge earthquake and you saw the  
9 destruction that thing did -- I mean, I don't know how  
10 to explain it -- thrown out of my bed, watched the  
11 freeways crumble.

12 And now you guys are telling me that, like,  
13 these canisters are going to be stored and there's no  
14 earthquakes, according to -- whatever. I mean, it was,  
15 like, "There's no earthquakes. Don't worry about it.  
16 Throw away earthquake insurance. It's no big deal."

17 Because, it sounded to me like we don't have  
18 anything to worry about -- no tsunamis, no nothing,  
19 everything's good. I just don't see it. And my kids  
20 and everything -- I mean, I worked for and to know that  
21 that happened, especially after the news report that  
22 came out from Fox about Fukushima and how the radiation  
23 is lining our coastline.

24 I'm fascinated, but I've never seen the  
25 numbers of what our radiation is up our coastline. I

1 mean, no one's ever said anything. It's, like, Fox  
2 came out and they said that large amounts of radiation  
3 has been detected off of the Orange -- Oregon coastline  
4 and never anything after that.

5 It's just like a really serious situation in  
6 Fukushima. Three -- what is it? -- 300 tons or  
7 radiation being pumped into the ocean every day. I  
8 mean, this is from Fox new, so you wouldn't think it  
9 would come from them. That all of a sudden, nothing.  
10 But just out of curiosity -- I know I got 42 seconds --  
11 do you guys know the levels of radiation off our  
12 coastlines right now? Anybody?

13 CHAIRMAN DR. VICTOR: Please make your -- your  
14 comment.

15 MR. HIGGINS: Well, that's my comment. It's  
16 like --

17 CHAIRMAN DR. VICTOR: Okay. Thank you.

18 MR. HIGGINS: But I got 32 seconds.

19 You have -- you have all this knowledge and  
20 all this information and everyone says nothing happens  
21 unless it obviously goes to Washington. I agree with  
22 that. But one has ever asked any questions in regards  
23 to radiation levels from Fukushima off our coast.

24 No one has really explained the levels of what  
25 an earthquake can do and everyone is saying that,

1 "Well, let's just store this stuff off of San Onofre  
2 because there's no earthquakes there and we don't have  
3 to worry about tsunamis," which we know is completely  
4 false. I mean, come on. So, anyway. But thank you so  
5 much. One second. I finished. Look at that.

6 (Applause.)

7 CHAIRMAN DR. VICTOR: Thank you very much.

8 So I was told that we're out of time for the  
9 public comment period, but we have only three people  
10 left on the list, so let's get these comments so we can  
11 get as much in as possible.

12 Tom White or Whiten. If I'm pronouncing your  
13 name -- he's given up on us. Jennifer Massey and then  
14 Ricardo Nicole or Neal.

15 VICE CHAIRMAN BROWN: Nicol.

16 CHAIRMAN DR. VICTOR: Nicol. Jennifer Massey,  
17 and then Richard Nicol is the last speaker.

18 MS. MASSEY: I'd like to thank you all again  
19 for serving on the Panel. We very much appreciate it.

20 I have three questions: SONGS was designed, I  
21 was told, for a maximum of 7.0. So, what do we do if  
22 after learning tonight that we might experience a 7.3  
23 to 7.4? What are the consequences? And what can we do  
24 to upgrade this facility? Or -- I don't know. That's  
25 why I'm asking the question. Somebody else -- I don't

1 have the answer. I'm asking you guys.

2 Why empty the pools by 2019 when aren't they  
3 necessary if a canister should develop a leak? That's  
4 the information I've been given all along. If a  
5 canister should develop a leak and you can discern that  
6 it has a leak, you need to have the pools to put them  
7 back into.

8 So why is it that Edison wants to empty the  
9 pools? Is that because then they won't be liable  
10 anymore?

11 And my third question is: When is Edison no  
12 longer liable for an accident at San Onofre? When --  
13 when is Edison can wash -- wipe their hands and say,  
14 "Ah-hah. We're gone. Our shareholders -- we're safe.  
15 They won't ever be taxed or charged or anything else."

16 And how much -- once Edison is no longer  
17 liable to us, how much can we rely on FEMA physically  
18 and financially when Edison is no longer liable?

19 Are we going to be treated the way the -- the  
20 survivors of Katrina? I hope not. So I hope I get the  
21 answers at some point. Thank you very much.

22 CHAIRMAN DR. VICTOR: Excellent. Thank you  
23 very much. So, as it's our custom, Tim and Dan are  
24 going to organize responses to questions where it's  
25 possible tonight within the limits of our time. We're

1 going to run over that time. But -- and then we're  
2 going to make sure all the questions get answers as  
3 part of our regular docket. Dan? Tim?

4 MR. NICOL: Yes. My name is Ricardo Nicol.

5 CHAIRMAN DR. VICTOR: Oh, sorry. Oh, I'm  
6 sorry. I'm sorry, sir. Please take your -- take your  
7 three minutes.

8 MR. NICOL: My name is Ricardo Nicol. I live  
9 in San Clemente, about three miles from the San Onofre  
10 plant, so I want the waste removed as soon as possible.  
11 I want the job done. While there is something called  
12 consent-based interim siting proposal that wants to  
13 send the waste to other areas in the country who need  
14 the business, consent-based siting for the interim  
15 storage of nuclear waste is an interim solution to the  
16 interim solution that's already been in place at  
17 San Onofre for over 50 years and it could take decades  
18 and billions of dollars to find approved and build the  
19 new sites and transfer the nuclear waste to them, an  
20 additional decades and millions more to decommission  
21 those sites and, again, transport the waste when a  
22 permanent storage is established.

23 Why the duplication of effort and time and  
24 money? Instead, why not concentrate our resources on  
25 finding the permanent solution and prepare the nuclear

1 waste now in the best possible manner for eventual safe  
2 transport and storage?

3 Besides, isn't there an ethical aspect in  
4 having or most economically disadvantaged communities  
5 consent to accept for money what is unacceptable to the  
6 rest of us? This is a cynical proposal.

7 This consent-based siting. It's motivated by  
8 greed, creating jobs that are not needed and driven by  
9 political "expedience." Thank you.

10 CHAIRMAN DR. VICTOR: Thank you for your --  
11 for you comment. Okay. Dan and Tim.

12 SECRETARY STETSON: I'm going to go ahead and  
13 start.

14 Tom, there was a question by Gary or,  
15 actually, comment that went on that initially the plant  
16 was designed to a 6.0 and then upgraded to a 7.0 in  
17 terms of its capabilities. Could you enlighten us on  
18 that, please?

19 MR. PALMISANO: Gary, I will have to go back  
20 and do some research to see if that's a Unit 1 basis.  
21 I was referring to Units 2 and 3. At the time they  
22 were licensed to operate the design was a 7.0.

23 If you're saying during the design process  
24 something changed, I would have to go back and research  
25 that. What I can tell you is, the plants, when they

1 were licensed by the NRC for Units 2 and 3 to operate,  
2 the design was the 7.0 Richter, corresponding to the  
3 point zero, 0.67 ground motion acceleration.

4 CHAIRMAN DR. VICTOR: And just while you're on  
5 the subject --

6 MR. PALMISANO: But I will have to go back and  
7 ask.

8 CHAIRMAN DR. VICTOR: And while you're on the  
9 subject, Jennifer Massey raised the question about so  
10 now we know there's potentially 7.4, does that change  
11 your evaluation?

12 MR. PALMISANO: No. And as I said during my  
13 presentations 7.0 was original through the decades  
14 after the year two thousand -- through the years after  
15 2000, the plant was reevaluated to demonstrate it could  
16 withstand a 7.5 Richter magnitude on the Newport  
17 Inglewood/Rose Canyon Fault. So 7.5 is the operative  
18 Richter scale number on the -- the fault of interest  
19 today.

20 VICE CHAIRMAN BROWN: And then -- and then  
21 Jennifer also asked the question about for -- it was  
22 designed for a max 7.0 earthquake, but there is a big  
23 difference between what was an operating plant and is  
24 now just the spent fuel pool and then, ultimately, dry  
25 cask storage.

1           So could you elaborate on what that -- the  
2 differences are there?

3           MR. PALMISANO: Yeah. To keep it brief, with  
4 an operating plant at full power in service, there are  
5 many more parts of the plant that have to withstand the  
6 earthquake to retain cooling for the fuel in the  
7 reactor itself and many active components, like diesel  
8 generators and pumps, that would have to start and  
9 active to cool -- cool the fuel, okay, in the reactor.

10           The spent fuel pool is a very different  
11 situation: The reactors are defueled, all that  
12 equipment is retired and not in service. The spent  
13 fuel pools have fuel that's decayed greater than five  
14 years.

15           Now the heat load is 1/10th of what it was  
16 five years ago and it's covered with half a million  
17 gallons of water. If I turned off all the pumps,  
18 there's days before the temperature even changes  
19 significantly.

20           So the pools are very different in terms of a  
21 post-seismic event and how you would recover from it.  
22 I don't want to characterize it as much safer, but they  
23 are less of an immediate hazard as an operating reactor  
24 in a seismic event.

25           So we can go at length at this in a future



1 meeting.

2 VICE CHAIRMAN BROWN: Right.

3 MR. PALMISANO: Because I could take a lot of  
4 time on this. But the focus now is spent fuel and the  
5 spent fuel and dry cask storage, what is needed to keep  
6 it safe during and following a seismic event. That's a  
7 very different story than an operating reactor.

8 SECRETARY STETSON: And then, Tom, she also  
9 asked "Don't you need to keep the pools in case there  
10 is a leak in the future?"

11 MR. PALMISANO: You know, we've used dry cask  
12 storage in the industry since the late '80s. Nobody's  
13 needed to take a canister back to a pool to unload the  
14 fuel. There are many things that you would, like  
15 encapsulate it in a larger container long before you  
16 consider unloading it.

17 But it's somewhat a separate question about  
18 "Do you need to keep the spent fuel pools?" And that's  
19 a topic we need to spend more time on.

20 CHAIRMAN DR. VICTOR: I think we need to --  
21 when we talk about Defense-in-Depth, we need to have a  
22 conversation about when did the pools not become not  
23 necessary? How do you know what's really going on  
24 inside the casks?

25 MR. PALMISANO: Yeah.

1           CHAIRMAN DR. VICTOR:  Some questions were  
2 raised tonight about what drop risks might be during  
3 a --

4           MR. PALMISANO:  Yeah, there's a lot of --  
5 there's a lot of information that -- there's a lot of  
6 misinformation stated we can clear up if we can devote  
7 a segment to talking about how the canisters were  
8 tested.

9           VICE CHAIRMAN BROWN:  I think -- I think,  
10 frankly, those are the questions.

11          MR. PALMISANO:  Yeah.

12          VICE CHAIRMAN BROWN:  You know, I mean,  
13 because we're talking about seismic risks and all  
14 different things, but, ultimately, after 2019, that's  
15 the only question, is how the dry casks will perform.

16          MR. PALMISANO:  Right.

17          VICE CHAIRMAN BROWN:  And what that will look  
18 and feel like.  That seems to be, if I'm not mistaken  
19 -- that seems to be the most compelling discussion, I  
20 think, that we have in front of us still.

21          MR. PALMISANO:  Yes.  Thank you.

22          CHAIRMAN DR. VICTOR:  Okay.

23          SECRETARY STETSON:  And, Tom, to finalize her  
24 question today was "When is SCE no longer liable and  
25 does FEMA play a part in this?"

1           MR. PALMISANO: Well, SCE is responsible for  
2 the site and we're responsible for the spent fuel,  
3 under the NRC license, until the fuel is removed from  
4 the site by the Department of Energy.

5           Okay. So we will responsible. You heard me  
6 say it before, and I'll say it again, the current plan  
7 shows that spent fuel will last of it will leave the  
8 site in 2049, that's with the current Department of  
9 Energy. We're responsible for it until then.

10          VICE CHAIRMAN BROWN: So Judy Jones asked the  
11 question regarding the joined proposal PG&E agrees to  
12 retain a commitment to emergency services and planning.  
13 I'd imagine you have to review this in -- in answer to  
14 that. Could you speak to that? Or is that something  
15 we can --

16          MR. PALMISANO: Well, let me just -- we had  
17 made a commitment to our local communities and our  
18 interjurisdictional planning commission to maintain the  
19 current level of funding through 2020 as we did during  
20 an operating plant.

21          We've also agreed to maintain the siren system  
22 because they're important for other hazards other than  
23 something emanating from the nuclear plant, and we've  
24 agreed to negotiate what -- in the longer term, after  
25 2020, what the local needs are and what we're willing

1 to agree to.

2 Because support of the local communities and  
3 the emergency responders is important to us and it's  
4 important to the communities. So we stated that  
5 publicly. We're going to continue full funding and  
6 then we will negotiate an appropriate funding level.

7 I don't know the specifics of Pacific Gas and  
8 Electric's commitment, so I really can't comment on  
9 what they've committed to.

10 VICE CHAIRMAN BROWN: One item, Laurie  
11 Headrick asked a whole series of questions that were  
12 good ones, many of them have been previously addressed  
13 on the website -- David, you can correct me if I'm  
14 wrong -- a lot of them regarding security and no funds,  
15 et cetera, so it's difficult for me to cover the  
16 balance of those, but I will refer to the website and  
17 some FAQs there.

18 The only one that I think was -- actually, you  
19 answered about how do you build the new canister, do  
20 you need the pool for that. And I believe you -- we're  
21 going to address that.

22 MR. PALMISANO: Well, that's not building a  
23 new canister. The question was, should you have to --  
24 is there a need to maintain a pool --

25 VICE CHAIRMAN BROWN: The pools too, yeah.

1           MR. PALMISANO:  -- to take one back to unload  
2  it.  That I think is the question to be discussed in  
3  the future.

4           SECRETARY STETSON:  Okay.  And, Tom, there's a  
5  question:  Do you monitor the level radiation off of  
6  San Onofre?

7           MR. PALMISANO:  We have an environmental  
8  monitoring program.  We waited until the plant  
9  operation and the plant decommissioning.  If you're  
10 talking about the studies that have looked for what's  
11 coming across the oceanside from Fukushima, the  
12 government does that.  Okay.  But, yes, we monitor  
13 radioactivity in and around the site, from our  
14 operation.

15          SECRETARY STETSON:  But, periodically, you do  
16 studies on the area near the outfalls?

17          MR. PALMISANO:  Yes.  Yes.

18          SECRETARY STETSON:  Okay.

19          MR. PALMISANO:  Yes.  That's what -- and we  
20 can plan sometime to come in and talk about what our  
21 studies have shown over the decades.

22          CHAIRMAN DR. VICTOR:  There's a cluster of  
23 seismology questions I wanted to be sure to get Neal in  
24 on.  Do you guys want to go to those right now?

25          VICE CHAIRMAN BROWN:  Yes.

1           SECRETARY STETSON:  Yes.

2           VICE CHAIRMAN BROWN:  So, Bob, Mr. Pope asked  
3 Neal about would you make yourself available for Q&A?  
4 Are your data and calculations available?  And then the  
5 third question was, are the dry cask tested for  
6 degradation as well?  In there -- do you assume  
7 degradation when you do your testing and assumption on  
8 earthquakes?  And --

9           MR. PALMISANO:  And, again, let's plan when we  
10 have, I think, in the third quarter we come in and talk  
11 Defense-in-Depth, I can talk about how the canister is  
12 designed, the testings required, how it's licensed,  
13 what is analyzed for, and then where the aging  
14 management program --

15          VICE CHAIRMAN BROWN:  It definitely deserves a  
16 serious discussion.

17          MR. PALMISANO:  Yes.

18          VICE CHAIRMAN BROWN:  And, Mr. Pope -- excuse  
19 me.  Neal.  Apologies.

20          DR. DRISCOLL:  Mr. Pope, we'd welcome  
21 interaction.  Scripps is a nice place.  And the data  
22 and the publications is publicly available, and so I  
23 would welcome that scientific process.

24          CHAIRMAN DR. VICTOR:  I would urge, could you  
25 also look at the draft questions that Gary Headrick has

1 helped us organize and Gary is going to help us with  
2 the process and all of us understand kind of how the  
3 process is working, who is engaged and so on.

4 Because I think it would really be helpful  
5 rather than ping-pong on this to get a course set of  
6 questions that people are interested in, get a course  
7 set of answers and then build up -- precisely, because  
8 science evolves, build up, you know, what do we know,  
9 what don't we know, how do we think about uncertainty  
10 and risk and so on. Thank you.

11 VICE CHAIRMAN BROWN: To that same point, for  
12 the future meetings, we talk about casks. Mr. Langley  
13 asked a series of questions about how casks are formed,  
14 when dropped, how the silos interact.

15 MR. PALMISANO: And we can answer all those.

16 VICE CHAIRMAN BROWN: Okay.

17 MR. PALMISANO: Yeah, we can answer. It'll  
18 take a presentation, so rather than just start quoting  
19 specific comments, let's -- let's organize a  
20 presentation.

21 CHAIRMAN DR. VICTOR: You don't have time for  
22 a presentation right now.

23 VICE CHAIRMAN BROWN: And then -- and then  
24 Nina also had requested --

25 CHAIRMAN DR. VICTOR: Nina.

1           VICE CHAIRMAN BROWN: Nina. I get that wrong  
2 all the time.

3           -- an update on the aging management system.  
4 One caveat on that is that we actually -- there was a  
5 request for us to go to the CCC and get the permit  
6 revoked, as a Community Engagement Panel that falls  
7 outside of our realm of responsibility, but we  
8 certainly can address the aging management system and  
9 the update we're going to be receiving at the next  
10 meeting regarding that.

11           MR. PALMISANO: Correct. Right.

12           CHAIRMAN DR. VICTOR: The August meeting will  
13 be --

14           VICE CHAIRMAN BROWN: Yeah. Excuse me.  
15 August meeting.

16           SECRETARY STETSON: Part of the discussion had  
17 to do with the potential for a tsunami and how large it  
18 might be. But could you say -- tell us how high the  
19 wall is there in terms of possible protection?

20           MR. PALMISANO: So the tsunami wall for Unit 3  
21 that was built when the plant was operating is 30  
22 foot -- 30 feet and we didn't present a lot of data  
23 about the expected height of the tsunami. You heard  
24 Dr. Driscoll talk about what would generate a tsunami  
25 wave.



1           The height of the wall for Units 2 and 3 was  
2 designed for the maximum expected tsunami, with some  
3 margin, and exceeds the numbers that we're currently  
4 aware of from the scientific studies. And, again, we  
5 can, you know, prepare a slide that explains that in  
6 more detail.

7           VICE CHAIRMAN BROWN: Torgen Johnson also  
8 asked -- and this is probably for Neal -- there were a  
9 series of questions about helium isotopes in the fault  
10 lines, paleo-evidence for a massive tsunami when they  
11 would go 6 kilometers inland as well as -- I had one  
12 last question on that and that is regarding dry cask  
13 storage and their performance at Fukushima I think  
14 would be an interesting note on that because there was  
15 an idea that a tsunami would rupture all the dry cask  
16 we have onsite so I'm --

17           MR. PALMISANO: Yes, the tsunami would not  
18 rupture our dry cask system. There was a dry cask of a  
19 different design. I think it was a thick canister  
20 design that survived Fukushima but, again, we can pull  
21 that data up.

22           VICE CHAIRMAN BROWN: That will be  
23 interesting. And then, you know --

24           DR. DRISCOLL: So the question about the large  
25 tsunami here, a paper in 2005 by Kuhn proposed based on

1 looking at deposits that there was a 7-plus potential  
2 earthquake in the Newport Inglewood.

3 His reasoning for having it on the Newport  
4 Inglewood is he said that that was the largest fault  
5 offshore. With new mapping, we realized that the  
6 San Diego Trough, San Pedro Fault is larger.

7 His evidence was based on looking at tsunami  
8 deposits on top of these terraces. Tsunami deposits,  
9 one, are very hard to identify and rule out from storm  
10 deposits. I do think he did a rigorous job. The  
11 dating is the question. So he didn't -- dating a  
12 tsunami deposit, because it doesn't have much organic  
13 material in it, is very difficult. So he used terrace  
14 dates.

15 And so here's the thing, back 125,000 years  
16 ago, sea level was about where it is today and we  
17 pulled up these terraces, 5E, 5A, so they -- they were  
18 core periods when there's still stands at sea level and  
19 we make abrasion platforms.

20 The question is, the alternative explanation  
21 is that these deposits were made when the abrasion  
22 platform was near sea level and then the conveyor belt  
23 that lifted these up have them at their present  
24 elevation. So Kuhn proposes a 100-plus meter tsunami  
25 is possible.

1           When we look at observations offshore and we  
2 look at modeling of tsunamis, the model by Kirby in  
3 slope failure, myself, on the East Coast, these are  
4 large failures that would generate a tsunami of about  
5 6 meters. If you look offshore --

6           Manuel, could we pull up a slide of the Lake  
7 Tahoe?

8           So, here my colleagues and I, the team, when  
9 we map offshore, we don't see any evidence for large  
10 failures that would be tsunamigenic. So, based on the  
11 observations and models, we interpret some of these  
12 deposits as being older and being uplifted by the  
13 regional uplift of the terraces.

14           The terraces go all the way up to -- on the  
15 order of 600 meters and they go back about 3.9 million  
16 years. We've had slow up lift of about .16 millimeters  
17 per year in this region.

18           So one has to ask the question, were the  
19 tsunami deposits in place when the terraces were high?  
20 Or, conversely, were they placed when it was low?

21           This is Lake Tahoe. It's a beautiful place to  
22 work. I've mapped many features in this basin and  
23 published papers on them, with Graham, and our team.  
24 These are what large failure blocks look like on the  
25 marine floor and this probably caused a large tsunami.

1 And Steve Ward, up at Santa Cruz, UC Santa Cruz modeled  
2 this. We looked for evidence for this to try to test  
3 whether there was paleo-tsunamigenic evidence offshore  
4 in the Southern California Bight and we don't observe  
5 it, so --

6 CHAIRMAN DR. VICTOR: Thank you. Very last  
7 question.

8 VICE CHAIRMAN BROWN: My last comment.

9 CHAIRMAN DR. VICTOR: I'm sorry. And just for  
10 clarity, the Kuhn paper that you referred to is the  
11 same paper that Torgen Johnson referred to in his  
12 remarks. It's reference 10 of the Public Watchdogs.

13 DR. DRISCOLL: Yes, it's a 2005 paper in  
14 Engineering Elsevier Journal.

15 VICE CHAIRMAN BROWN: So my last comment has  
16 to do with primarily with Mr. Nicol from San Clemente  
17 and then also, in interrelated way, Aschoff recently  
18 wrote an article regarding Congressman Issa's bill.

19 The idea of the consolidated interim storage  
20 that poses an ethical challenge is one that a little  
21 mystifying to me, but it ultimately is also very  
22 dangerous, because the idea that a consolidated interim  
23 storage solution is considered unethical or improper,  
24 it would mean that a permanent storage solution can be  
25 considered also unethical and improper. There's no

1 difference between the two. It's just based on  
2 longevity.

3 And so unless we are all extremely comfortable  
4 with that waste being on our bluffs for the next 500  
5 years, we need to probably get more comfortable with  
6 CIS and with long-term -- with the long-term  
7 repositories.

8 I'm just stating this as fact, that there's a  
9 drumbeat to try and knock down CIS or Congressman  
10 Issa's efforts to try and get the waste removed is one  
11 that I think is exactly the diametric opposite that  
12 99.9 percent of our communities want.

13 And so I really want to make an assertion  
14 here. I think we have forg -- we have forged wonderful  
15 ground on getting a CIS done, but we have to embrace it  
16 because, ultimately, for the safety of our -- not only  
17 us locally, but also for our nation, it does not belong  
18 in a marine environment where there are earthquake  
19 faults.

20 All due respect to all the safety and all  
21 these wonderful things, it still doesn't belong here.  
22 And so we should get more comfortable with this idea,  
23 and I just -- that's all it is.

24 CHAIRMAN DR. VICTOR: Okay. Thank you very  
25 much. So we're quite massively overtime. I want to

1 see if anybody has any other comments of the urgent  
2 nature before we -- before we close tonight.

3 The next meeting will be on exactly the  
4 subject and on consent and how you do consent in an  
5 ethical way. So, please do come back and join us  
6 for -- for that meeting.

7 I want to thank Neal again and all of you.

8 MR. HEADRICK: You didn't cover one of the  
9 more important questions. We submitted a lot of them.  
10 But I just wanted to hear, while Dr. Driscoll is here,  
11 how he would analyze some of the graphics I put  
12 together just briefly.

13 I know you've had them for a few days. And  
14 see if he could just explain, just put my mind at rest.

15 CHAIRMAN DR. VICTOR: Neal. Yeah, okay.

16 DR. DRISCOLL: So here when you look at Google  
17 Earth and you look at the slopes, there's a vertical  
18 exaggeration, so the slopes on the continental slope,  
19 as we go off the shelf that's very flat, the shelf has  
20 less -- much less than one degree.

21 Those slopes are on the order of 4 to 6  
22 degrees. So Google Earth and all of the way, we  
23 project the sea floor, like what I just showed in the  
24 Lake Tahoe, has huge vertical exaggeration.

25 And if I have to show it to you with no

1 vertical exaggeration, I need a wall the size of a  
2 football field because it goes so far. So the displays  
3 that -- and I understand your concerns and I share  
4 them, tsunamigenic possibilities, but that slope is  
5 very gentle. And if we looked at it in a true  
6 one-to-one, it's less than the bunny slope. But I  
7 welcome you to come with Mr. Pope and we can all meet  
8 down at Scripps and I'll arrange it and I'll buy lunch.

9 VICE CHAIRMAN BROWN: What? Take Ray.

10 CHAIRMAN DR. VICTOR: We're adjourned. Please  
11 drive safely.

12 (Whereupon, the videotaped CEP meeting  
13 adjourned at 8:50 p.m.)

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## REPORTER'S CERTIFICATE

I, the undersigned Certified Shorthand Reporter in and for the State of California, do hereby certify:

That said videotaped CEP proceedings were taken by me Stenographically and was thereafter transcribed into typewriting under my direction, said transcript being a true and accurate transcription of my shorthand notes.

I further certify that I am neither financially interested in the action nor a relative or employee of any attorney or any of the parties.

IN WITNESS WHEREOF, I have on this date subscribed my name, THURSDAY, MARCH 16, 2017.



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CARLOS R. HICHO  
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