Mr. Anders: Good evening. My name is Chuck Anders. I would like to welcome the panel and the public to the eighth public meeting of the Diablo Canyon Decommissioning Engagement Panel. The topic for tonight is spent fuel storage. Before we begin, I'd like to introduce Adam Pasion, who is going to give us a safety briefing.

Mr. Pasion: Good evening. We have some preassigned safety roles this evening. So those with safety roles, please raise your hand. Thank you. If we experience an earthquake this evening, let's all duck and cover as best as you can. After the shaking subsides or if we need to evacuate for any other reason, we'll exit through the rear doors here. You can go left there, and to make an additional left or right, you'll be on Monterey Street and then we also have an additional exit here. To the left of the dais, you can exit out the building that way. Thanks, Chuck.

Mr. Anders: Thank you, Adam. I'd also like to remind everyone that this meeting is being live-streamed and anyone that is watching has the opportunity to submit comments on Diablo Canyon Engagement Panel website.

So the next item on our agenda is a report from Tom Jones on PG&E's status on filing of the panel vision.
MR. JONES: Thanks, Chuck. Three main things to make the panel and the public aware of in the coming 30 to 60 days, it's actually a very busy March for this project, the proceeding and nuclear decommissioning in California. So first is that last Friday on the 8th, we filed the panel's strategic vision document with the Public Utilities Commission via motion. So we'll wait the PUC's acceptance of that and how they determine to handle the proceeding going forward.

Second is the CPUC issued an order for some additional supplemental testimony on some issues submitted by Mothers For Peace and that was on reactor embrittlement from an operational issue, but, still, it was an order from the CPUC. So -- and there's also some additional questions about used fuel strategy and so those will be submitted this Friday, March 15th to the Utilities Commission. Those documents will be served in the service list, they'll be on our website and the panel will receive an update on those items, as well. So we're 72 hours out from getting additional -- or excuse me -- 48 hours out from getting additional information on those two topics.

And then, lastly, and I know the panel, many have been following San Onofre's decommissioning very
closely, as are members of the public. On March 21st, the State Lands Commission is having a long awaited environmental meeting to adopt, potentially, their environmental impact report on how to decommission the facility. So that's one of the major discretionary permits. It's a huge hurdle for San Onofre to achieve that and that will allow them to then finish up with the Coastal Commission and have those discretionary approvals from the State of California to then begin work on the project. So that's one of their two major dominoes to go before they can do work.

Just a reminder for folks, the plant stopped operating in 2012. They decided in 2013 to no longer operate and they've been in that decommissioning planning phase those five and a half, six years and you'll find that that matches what we've been sharing with the public and this panel about how we intend to take advantage of the 2020 -- or 2016 time frame when we announced to when the project got rolling in '17. We want to use those five years, six years to obtain all those permits.

So it's the single most important benchmark for us on how the State of California, given today's rules, will treat decommissioning and so we're very interested and we'll be attending that proceeding and looking for
MR. ANDERS: Thank you, Tom. I would now like to introduce our new panel member. Jim Welsch will assume the single PG&E seat on the panel in place of Jon Franke. Jim is vice-president of Nuclear Generation and chief nuclear officer and as of March 1st will be responsible for all decommissioning activities at Diablo Canyon Power Plant and, also, Humboldt Bay. Jim has 40 years of nuclear and energy industry experience and started his career in the nuclear Navy. He is the lead contact with the NRC and is a member of a Nuclear Facilities Decommissioning Master Trust Committee.

Jim's bio's on the website for anyone who wants to take a look at it and, Jim, do you have any words for us?

MR. WELSCH: Thank you, Chuck. First I'd like to -- this is my first meeting and I just want to express my appreciation to this engagement panel. Very warm welcome and I really appreciate the opportunity to be part of this panel. My role is a little unique on the panel. It's really not -- I'm not here to help shape the work of the engagement panel, but it's so important that I hear and really have a good understanding of the intent behind and what the
engagement panel will work on and make suggestions for PG&E.

You know, so this recent additional responsibility relative to decommissioning, I really welcome the opportunity to serve in this capacity. As Chuck mentioned, I've worked at Diablo Canyon for 35 years. My wife is a lifelong Arroyo Grande resident. I have four children and nine grandchildren on the Central Coast. So aside from being the PG&E officer assigned for all things nuclear, I have a personal interest and I believe a good understanding of what this process should be and what it can mean to this community. So I welcome this opportunity.

My job, again, is to listen and make sure that we understand well the recommendations of this engagement panel and that we can carry those forward as we work through our other key stakeholders and with the California Public Utilities Commission. Thank you, Chuck.

MR. ANDERS: Thank you very much.

MR. KARLIN: Chuck, if I might, I want to -- I think I speak for the committee in saying we want to thank Jon Franke for his hard work and good faith in participation in our panel through the last year and he's been a really good member and I think we all look
forward to, Jim, your participation and help, as well.

So thank you, but we want to thank Jon for his help.

MR. ANDERS: Thank you, Alex.

Okay. Just a quick overview of tonight's agenda. We're very fortunate to have with us tonight Dr. Robert Budnitz with the Independent Safety Committee who is going to discuss the Independent Safety Committee activities and, also, spent fuel storage. We're going to have an overview of the spent fuel storage strategy and schedule from PG&E and then we'll have the opportunity, also, for public comment immediately after the break, which will happen approximately 8:30.

So I just want to mention the fact that this meeting is a continuation of a dialogue and discussion with regard to spent fuel activities of the panel on January 22nd, 23rd, held two all-day-long workshops where they heard from experts and the public on spent fuel issues. So without any ado, I want to introduce Dr. Robert Budnitz.

Bob, if you could come on up, take the podium, I'm going to ask you to introduce yourself and, also, your experience and background dealing with nuclear issues, especially at Diablo Canyon.

DR. BUDNITZ: Okay. I have to speak into the mic because it's being recorded and broadcast or
something, huh? So my first reaction is it would be really nice if I could face you and you, but, apparently, I can't. No. I see it up there, but you understood what I said.

Okay. Just briefly, I showed up in Berkeley about just over 50 years ago as a post-doc at the Lawrence Berkeley Laboratory and that's where I am now; although, I had 25 years in between in which I wasn't there. I had a one-man consultancy. What I do for a living is nuclear power plant safety. The projects I've done over the years have mostly been working either with the utility industry here and abroad on trying to understand safety problems that arise with large reactors all over the world and I have worked all over the world and tried working with them and other experts to try to figure out if there's a safety problem, what to do to make it go away or to reduce its impact, and I've also done an awful lot of work with the Nuclear Regulatory Commission trying to help them understand how to regulate safety better. I had one two-year interval back in the '70s at the NRC. I was on the NRC staff for a couple years, in 1978, '79, '80. The accident on Three Mile Island occurred right in the middle of that, and for the first period there, I was the deputy director of the office of research and then I became the
director of the office of research, which, at that time, as it still does, has research programs on all the different aspects of reactor safety and other NRC missions, and I left the NRC in 1980 not because I love that agency, I really did -- not because I didn't love the agency, but we couldn't wait to get back to Berkeley. We would have crawled back to Berkeley on our hands and knees after two years in Washington. That was personal. It wasn't because of that agency, which I loved, and then I had a one-man consultancy after having been in LBL, and a few years ago, I turned that in and now I'm at LBL again. This is a big laboratory on the hill above the campus in Berkeley and a year and a half ago I retired and I'm still working because they brought me back and I have a whole lot of other things I'm doing that aren't part of them, too.

So that's just a brief background about who I am. I'll explain to people that don't know what our committee is. Those of you that know a lot about it will be bored to tears the next minute or two. The committee was established almost 30 years ago. It was a -- it came from members of the public that wanted to have an independent oversight of the safety of the power plant, Diablo Canyon Plant, because an independent oversight that wasn't the Nuclear Regulatory Commission
and was independent of everybody else was thought to be a valuable addition to the array of groups and people looking at that -- at that plant and it's been there -- well, we just issued our 29th annual report. So you can see it's coming up to 30 years.

There are three of us. We serve a three-year term each. They overlap. One gets appointed one year, then the next year, next year, three-year terms. Per Peterson is appointed by the governor. One of us is appointed by the governor. I'm the attorney general's appointee. I was appointed the most recent time by Kamala Harris; although, going back, because I've had four terms, my first appointment was by Jerry Brown when he was the attorney general. I'm the attorney general's appointee and Peter Lam is the appointee of the chairman of the California Energy Commission.

So we're appointed by three different state officials, governor, attorney general, Energy Commission chairman, and we write public reports, which are available to everybody in the world publicly when we've adopted them. The way we do our business is we go to the plant about once a month, a couple of us. I probably am there, say, six or seven times a year because I go in between, too, and we look at almost everything we can think of that affects the safety of
the plant. If there's a problem with the reliability of
valves, we'll look at that. If there's a problem or an
issue with the training of operators, we'll look at
that. Even if there isn't a problem, we have a long
list of things we look at that isn't a problem just
because we do that routinely in order to make sure we
understand what's going on. If there's a problem at
another plant somewhere in the world and we learn about
it and it might apply to this plant, we'll ask the
question about, gee, have you looked at that and does it
apply? Often it doesn't, sometimes it does. Usually,
if it does, they've done something about it, in fact,
essentially always, and then we'll look to see whether
that -- how that came out, and besides those
fact-finding meetings, we have three public meetings
every year, one in October, one in February, one in
June, for two days. We hold it in Avila and -- Avila
Beach, and at those public meetings, anybody in this
room -- in fact, anybody in the room can come and it
largely consists of presentations by PG&E experts that
we ask to present to us on Topic Number 3 or Topic
Number 17. There will be a topic that we want to make
sure PG&E presents and we ask questions and the public
can ask questions.

So that history goes back 29 years. It's
really important to understand what the charter is. The charter in absolutely plain English from the start is we're chartered to review the operational safety of the plant and we understand that charter to mean -- of course, when the plant was new, we understand that charter to mean that, as it's written in plain English, it would end when the plant stops operating, which is in 2025, still six years hence.

So as it sits, that's our current sunset date, but at a public meeting about a year ago and then repeated at each successive one, we've had members of the public ask us whether or not we would consider or think about whether we have a role after the plant stops running and we don't have a position on that yet because we haven't adopted it. We've been debating it right along and we're not sure what we're going to do, but recently we had an interaction -- I'm just explaining the status so you'll know.

Recently, we had an interaction with a staff member at the Public Utilities Commission who told us that it would be very helpful if we could clarify our thinking about that for them because it's Public Utilities Commission is going to have to sort that out. We haven't even adopted our own position about that. Some people in the public urge us to continue, other
members of the public have urged us, no, no, no, we should just stop when it's over, when the plant ceases operation, and we're just not sure and we certainly haven't done anything substantive except to think about those questions. We haven't devoted much time to it.

We've tried -- and this is an important point before I get on to the main topic here, which is the spent fuel. We've tried to see if we can understand right now whether the decommissioning activity planning that's going on has an effect on the safety as it runs. We want to make sure -- it's a question that is very important to ask -- whether or not the activities that are going on, which some of which have personnel impacts, after all, somebody's work on that, they're not working on this, some which have budget impacts, some which have schedule impacts. We are charged and we are diligently trying to make sure that whatever is going on with decommissioning activities planning and all that doesn't affect the operational safety of the plant. If it does, we're going to call attention to it. That's our charter.

The other thing that is in our charter is, of course, the spent fuel. That's been true all along ever since the first fuel discharge way back in 1986 or '7. The spent fuel is a safety hazard, and I'll explain that
in a minute, and our charter has been right along to
look at that and make sure that part of the operation is
as safe as it needs to be, and then when 15 years ago or
so, the first planning for the independent spent fuel
storage installation up on the hill, the ISFSI, the
first planning went on, I wasn't on the committee at
that time, but the committee looked at that to try to
understand its safety and I'm going to talk about that
in a few minutes, and to understand what its
implications were for the overall risk impacts of that
plant out there because as long as there's spent fuel
there, there is a risk, which it's our charter to
understand.

So just to talk about the committee, we've
concentrated right along, including in this last period
after the announcement of the shutdown, we've
concentrated on trying to see if we can understand the
safety of that spent fuel between now and when it's shut
down. Okay? Because that's our charter, including the
plans for what they're going to do here. I'll talk
about that. And we've only thought a little about what
we might do in the long-term if we were extended -- by
the way, I won't be there. I'll be too old, but the
committee might. So it's not personal for me, but we've
thought about what we might do and we've differentiated
a couple things that I want to explain here about the role of the committee so everybody understands.

There are two different kinds of risks. They couldn't be more different. There's a risk as long as that spent fuel is on that site. Either in the pools, in the casks, as long as there's radioactivity on that site, there's a risk, and there's now doubt about that and everybody understands that.

There is also radiological hazard during the decommissioning activities themselves, and what I mean by that is after the plant shuts down and you wait and do different things, there's a whole lot of stuff out there that's radioactive that has to be decommissioned, it has to be taken apart and cleansed using columns or cleansers, or whatever, and that radioactivity has to go somewhere. If it's greater than Class C, it has to go into the casks and get disposed of like fuel. If it's really low level stuff, it has to be disposed of that way under Part 61 of the NRC's regulations. A whole lot of radioactivity, but the principal hazard of the decommissioning is industrial safety. It's a hazard to the workers, and I can't speak for the committee because we haven't decided, but if I was doing it, if it was just one instead of three, I would think that our charter absolutely shouldn't be involved with that
industrial safety stuff. It just doesn't seem to me that that's the sort of hazard that the people in this county are worried so much about. After all, it's really quite safe, even a small thing is really quite safe, but the spent fuel is dangerous. It's less dangerous as time goes on and it's less dangerous in the casks, but it's still dangerous.

So if I had my choice here, I think we would recommend to the Public Utilities Commission that the committee's charter be limited to looking at the safety of the spent fuel. How long? I'm not sure. We have to think that through. After all, it's going to be many years before it's all in the casks after shutdown and that schedule isn't even clear yet. So that's what I would think, but that's still to come and we, the committee, hasn't made a determination there.

I have two more things to say before I start getting into the technical topic. The first is that although I'm the chairman of this committee, temporarily -- by the way, there are three of us and we're friendly, we rotate, we said, Peter, you do it this year and, Per, you'll do it next year and I'll do it the next year. It's quite informal, but I'm the chairman at the moment, but I'm here not talking for the committee. I can't talk for the committee unless -- the
only way I can talk for the committee is if I read
reports word-for-word that we have adopted, okay, which
I won't do that. So I'm going to try to capture my own,
and it will be mine, not the committee's, my own
understanding of what the committee has said and I'll
try to make that distinction, okay, but it's mine, not
the committee's, even though I'm going to try to stick
to the meaning of what the committee has said and I'm
going to try to reflect what the committee has found and
what we've done and the things that we haven't yet done
and so on. Okay?

Then the last thing to say just before we get
into this is that in preparing these remarks here, I
thought about what I was going to say and I wrote it
down in an outline, it's handwritten, actually, no
slides, and I shared it with our two consultants. We
have two consultants in the committee who are experts.
They're fully competent engineers of the first rank,
certainly their credentials would qualify them to be
members of the committee, and I shared it with them and
got some feedback from them mostly about what things I
wanted to be sure I was on firm ground saying that the
committee had said just to make sure I had that right,
but as you can understand, I couldn't share that with
the other two members of the committee. It's illegal.
It violates some California act. All right? It's the Bagley-Keene Act. So that's just explaining this distinction that I want to be sure you understand.

Okay. Now I'm going to turn to the topic. In preparation for this a couple weeks ago, Lauren Brown, who is on the committee here at the end, gave us a -- gave the committee a two-page document, which I suppose you guys saw, or whatever, which asked a whole lot of questions that he was hoping or the panel was hoping that I would address and I went down and I'm going to try to address them all, except about a third of them I can't address except to say we can't address it because it's out of our scope, or in some cases, we haven't done anything about it. So we'll say that. So it's with those questions in mind that I've approached this -- this talk I'm giving here. So I'm going to start -- although, you had two days about this on a weekend in February a few weeks ago, but I'm going to start and talk about our committee's understanding of the safety of those pools.

There are two spent fuel pools out there, one in Unit 1, one in Unit 2, and those pools have, except for the fuel that's been transferred up onto the hill in those casks, all the rest of the fuel that's ever been discharged from that reactor is in one of those two...
pools and that stuff's hazardous. Even though a whole lot of it has decayed, especially the oldest stuff, imagine stuff that was decayed 30 years ago, you know, taken out of the reactor the first cycle in 1987 or '88, 30 years ago, it's full of radioactive stuff that's hazardous.

And just to explain, one of the most hazardous radionuclides is Cz137. Its half life is 30 years. The first fuel discharge 30 years ago, half of it's still there. Half of that caesium is still there. The other half is decayed. A whole lot of the short-lived stuff is gone. There's a whole lot of stuff in that radioactivity -- that radioactivity when it's freshly discharged that has half lives of hours or weeks or months and it's gone of that earliest stuff, but that stuff is hazardous.

Now, in the normal state, which is where it is, and that's by design, it's not just luck, it's by tremendous engineering effort, except for the occasional fuel pin that has a small leak, and they haven't had very many of those at Diablo, there are very few, all that radioactivity is still contained in those fuel pins that comprise the assemblies, that comprise the core of the reactor. You have a pin and it's, say, 12 feet long, ceramic surrounded by a cladding, and the
radioactivity that was created during this fission process that made the heat, that made the electricity, that radioactivity that was created there and the original uranium that was -- that started off that's radioactive, it's all in those pins, but there are dozens of important radionuclide species in those fuel rods, in those pins, and every one of them has a different half life, some short, some long, but all of them that haven't really decayed away are all still in there and it's important for you to understand that the principal engineering challenge of spent fuel management is working to assure that with very high assurance that that stuff doesn't get out. Okay? That's the point. That's what engineers -- that's what I -- that's what people do, working to make sure that that stuff doesn't get out. We want to make sure that some day it's going to go to Yucca Mountain or some other place like that, you know, deep underground some place years from now, that between its discharge from the reactor and going underground, wherever that is some day, that none of that stuff gets out of those pins. Okay? That's the challenge.

So you might ask, well, how could it get out? By the way, there are few pins with little leaks and they're in the pools and they're going to have to be
encapsulated in some outer capsule -- you probably heard about this before -- some outer capsule before it's to be disposed of to make sure that when it -- you know, to make sure that when it leaves the pool and goes in the dry cask, that it's safe because it's encapsulated, but those are a very, very tiny portion of all the pins and radioactivity and so they will be handled safety. They have a routine monitoring of them now and a process that they haven't exercised yet, but they will when they have to to make sure that happens, but the principal risk in the pools is that stuff gets released.

Now, how does it get released? Well, unless some terrorist blows it up -- I mean that in the most terrible way. I mean, you know, imagine throws a -- I'm not talking about a nuclear weapon, but, you know, something that -- except for that, which I'll talk about later when I talk about security, the way that stuff could get out is if the water in those pools were to disappear somehow, drain out or get boiled off, and then the pins would be bare in the air.

Now, brand new fresh fuel pins just discharged from the reactor are very, very hot thermally, and the reason they're hot thermally is because they're hot radioactively because every radionuclide that decays produces heat, it's gamma heat or beta heat or alpha
some of them, and that heat heats things -- in fact,
that heat is -- is the concern because if that heat were
somehow to cause that fuel to be compromised, then
that's how it gets out.

Well, it turns out -- and this is easy to
explain and you probably heard it before. It turns out
that if it's brand new fresh fuel, just discharged, or
maybe it's been discharged six months ago, that for the
first couple of years, there's a danger that if that
fresh fuel were to have its water lost, that is the pool
were to be drained somehow, I'll talk about that in a
minute, that the heat generated by the fuel itself will
cause a compromise and a fire in the zirconium that's
cladding those pins -- that's cladding the pellets in
the pins in the spent fuel and that we call that a
zirconium fire, you probably heard about that, and that
zirconium fire can compromise the wood, compromise the
clay, and if it was just bare because of that, a whole
lot of that stuff would be convotulized and would get
out and that's a nasty accident. In fact, it's a really
nasty accident. Okay? However, if the fuel has been in
the water for -- and that's why it's got to be
underwater. It's got to be underwater to take that heat
away because if it's in the air, that accident is
possible. So it has to be kept underwater, but by the
way, ten years later, that won't happen.

Question: At what time will it -- that transition take place? Well, it depends on the configuration in the reactor and the fuel burn-up and things like that, but, generally, it's a couple of years. For some configurations and high burn-up stuff, it might be a little longer, but it's generally a couple years during which that's a really important accident to worry about and certainly it's not three or four or five years thereafter when -- if God uncovered, you wouldn't have a zirconium fire and a big release. So that's important for you to understand.

Now, how's it designed now? And I'm probably reiterating something you heard before. Well, these pools, if you saw them, they don't kind of look like an olympic pool because they're deeper, but the pins which are more than a dozen feet long with a thing, the top of them is under 23 feet of water. I think I have that number right, but if it isn't 23, it's close to that, and that's a lot of water. Okay? That water heats up because the radioactivity is doing what it's doing, the decay and alpha, beta and gamma and the neutrons heat up the pins and they heat up the water, and in order to take that heat away, there's an engineered system, which you probably heard about, in which there's -- the water
goes to a heat exchanger and there are pumps and valves and control systems that do that and that heat exchanger takes the heat away and ultimately it goes to the ultimate heat sink, which is the ocean, and cooler water is put back in the pool and that's how the pool is kept from overheating.

So the accident that you could contemplate, somehow, all of that heat exchanger system would fail. It might fail just because equipment is unreliable, it might fail because a human made an inadvertent mistake in aligning things wrongly, it could fail because of a large earthquake, and, of course, it could fail from a terrorist, but I'm going to come to that later, and those failures are failures that are similar to the sorts of failures that reactors are prone to get them in trouble. That is one of the big concerns in reactor safety. I'm not talking about the fuel pump. The reactor. It's that a pump might fail or electricity might fail or a valve might fail or a control system might fail and a certain combination of those things will cause an accident, which causes the thing you don't want. There's different combinations, but that same set of equipment is vulnerable to these sorts of reliability compromises.

So the main task of the spent fuel pool group
at that reactor today, and it's been true all this time
and it's going to be true for a while, is to make sure
that water is there, which make sure that heat exchanger
equipment is there and that it's functional and that
it's not compromised and our committee has been looking
at that right along for all these years and we're --
we've been very happy with the program that they have
for keeping that stuff reliable and doing inspections
and learning from little things that go wrong and making
sure that they learn from them and we're comfortable and
our committee has been saying this for right along that
we're comfortable that the way they're managing the
liability of that heat exchanger equipment, which, by
the way, is not just pumps and valves and so on, but it
has control systems that require DC power, either DC
from the AC because of inverters or batteries, it has
pumps that require AC power, and it has a whole lot of
valves and pipes and heat exchangers and things like
that that have to work properly.

So a principal possible accident would be if
you lost all the electricity, all the electricity, not
just the off-site power, which might happen, but there
are six diesel generators out there, two units, six
diesel generators, and now we have the flex equipment,
there are two more, and the likelihood that all of those
DC -- excuse me -- all of those diesel generators would fail is a very remote, but still possible possibility, but if we imagine that happened and none of this worked, then it will heat up and the water will start to boil and ultimately you'll lose them, you lose the level and it would become uncovered, but although it varies from one fuel load to the next, the time it takes to do that is many, many days, many days. It's way more than three days, it might be five days, it's several days, and that's lots of time, if you don't mind my saying, for the president or the governor or somebody to bring power in. We've got a lot of diesel generators around to bring power in.

So with that as a backup, I'm not -- because there's so much time, I'm not worried that that accident has any likelihood at all. I mean, I'm sure it has a likelihood, but it looks very remote, and our committee has found and we agree with the analysis that PG&E has done and NRC has reviewed that that accident looks very unlikely.

Well, how else might that be compromised? Well, big earthquake, big earthquake, it might knock out all that power, or more to the point, it might compromise the pools themselves or these pools are made with these walls that are reinforced -- you know,
steel-reinforced concrete and so on and recently the
PG&E team did a complete reanalysis of the seismic
safety of that pool structure. They had done it years
ago. They revisited it only within the last year or two
and it was reviewed by a whole lot of people and I've
reviewed it myself because that's what I do for a living
is seismic stuff and the general conclusion that
everybody's come to is those things are very strong. In
fact, they're stronger than the building it's in, the
pools are in. Okay? Which, itself, is very strong. So
we're not concerned or alarmed about that possibility
even though it's a possibility. We just don't think
that an earthquake big enough to compromise them is
going to come along. Okay?

The other new thing, new meaning only in the
last ten years or so, is that the NRC has an order which
the plant follows in which they've rearranged the fuel
in the spent fuel pools so as to have the old, old
stuff -- some of the old, old stuff that's still in
there is intermixed with the hotter newer stuff so that
the hotter newer stuff isn't all by itself. I
understand that Mark is going to talk about this later,
so I'll just mention it, and the reason that's a good
thing is if you lost the water, the hot -- there's a
whole lot of heat capacity in those old metal things and
the hot ones will have to use a lot of their heat to
heat up those and that slows down the heating process a
good deal and makes the time before you get in trouble a
lot longer than if they weren't in there.

The NRC asked for that reconfiguration, I can't
remember, about ten years ago and all the plants did it,
and Diablo, too, and that is safer than it was before.
However, as long as you need those old ones in there,
you can't take them all and send them up on the hill in
the ISFSI, not all of them. You need some because you
need to have this -- in other words, that's a safety
compromise.

So I'll talk about the comparison with the
ISFSI in a minute, but I just want to explain that that
old cold fuel is still warm, but it's cold, is in the
pools for that reason, but I also want to be sure you
understand the 30-year-old stuff has half as much Cz137
as the fresh stuff because it's a 30-year half life and
caesium's nasty. So you don't want to compromise that.
That's really important, too. That heat-up would be
delayed, but if you lost the water and you didn't
replace it, it's all going to be trouble ultimately and
that's a big release. You want to know how big? Well,
we've just had -- they've had 20 outages -- 21 -- 20
outages. They've got a whole lot more fuel in those
pools -- excuse me -- a whole lot more caesium in those pools than there is in the reactor, but the reactor has a whole lot of other stuff, which is short-lived and it's really dangerous, but the long-live stuff, and neverminding the actinides, which are longer still, but not very radioactive compared to the caesium, not very dangerous. I mean, they're dangerous, but not as much and so that's a big concern. Okay?

Before I -- before I go on to the -- before I go on to talk about the spent fuel in the casks, the independent casks system, I want to talk just a little about security and the reason I want to talk about it only briefly is it's outside of the remit of our committee. Our committee is specifically not chartered to look at the security issues at the plant. Okay? So we haven't, but I can tell you my view, which is not the committee's view. This is one of the only places here I'm going to give you my view and my view is based on a whole lot of experience I had for a long, long time looking at this, and although it's possible, this plant is really very secure against an attack on those pools. It's comforting to be able to say that and, of course, we can't talk about that much in public. You don't want to because one of you might be a -- you know, an adversary and we don't want to explain, but it's been
looked at by a lot of people and it's really strong and
I can't go into that very much, but I'll give a
comparison with the dry casks in a minute. Okay?

So originally -- this is not originally being
when the plant was new -- the plan had been that after 5
or 10 or 15 years, the spent fuel in the pools would be
put in the transportation casks and taken to a place
like Yucca Mountain, which is Nevada, which is not being
built at the moment, as you probably know, and disposed
of deep underground safely, but along the way, people
understood that wasn't happening and that keeping all
that stuff in the pools didn't make sense. First, it's
economic, second of all, it's a risk, and third of all,
it's just clumsy to manage, and so it was about 20 years
ago, maybe a little more, that the idea of having these
dry casks in which the pool could be stored, not
disposed of, but stored, came about and the first ones
were built in the east and Diablo's first loading was
about ten years ago, and as you probably know, or I
won't get into it, but there are 50 out of these great
big casks up on the hill above the plant, the
independent spent fuel storage installation, the ISFSI,
and everybody, everybody understood that they are very
much stronger against an adverse terrorist or nasty
attack, they really are, it's really hard to compromise
them in the security sense. Although our committee
doesn't think that, I'll just tell you mine, and I think
everybody understands that, and, furthermore, if you
were to compromise one cask, it's one percent or
something of all the stuff that was in the pool -- that
would have been in the pools before. Maybe it's two
percent or something like that, the caesium, for
example.

So you compromise the pool and that's a lot.
You compromise one of those things, which looks really
hard to do, even with an airplane. Not much gets out,
and, furthermore, most of it isn't volatile or goes
anywhere. So those things are really much more secure.
Okay. They're very strong, they're very safe and
they're anchored against seismic concerns and I've
looked at that personally because that's a lot of what I
do for a living, but they have another really important
feature that I want everybody in the room to understand.
They sit up there cooling the fuel that's in them
passively. There's no active equipment, there's no
electricity, there's no -- it just sits there cooling it
passively.

In the same sense -- let me just give you my
sense. If you hard boil an egg and put it on the table,
it will cool passively, right? How does that happen?
Well, there's convection and there's radiation and a little bit of, you know, conduction, and after 15 minutes, the egg is cool. There's no equipment. The air picks up the heat and goes somewhere and we all -- everybody, I hope, understands that and I can't explain it much, but -- I could, but I don't want to go into it, but the crucial heat removals of property is that it's passive, and by being passive, it means there's no equipment that could fail. There's no human to make an error in maintaining the equipment or turning the equipment on and off when they shouldn't have, and because of that, it's way safer than the pools, even though the pools are really safe. Okay? They're really safe, but this is safer. No doubt about that. If you had a hierarchy of safety, it's safer, and it's certainly more secure.

So, of course, it's desirable to move from A to B, pool to cask, over a time frame. Okay? And our committee has said that right along, but we're not the only people that have said that. I think there isn't anybody in the world that would dispute that there's a hierarchy of safety and one's safer than the other. There's no doubt about that at all.

So let me just go on and point something out, that to the extent that the pools are also very safe,
the schedule for moving from one to the other, while
it's desirable, has other parameters that are involved
in it, one of which is cost, by the way, and another of
which is that you have to stage it in a way as long as
there's still going to be fresh fuel in 2025, and there
will be fresh fuel in 2025 for a few years, you know,
until it -- it cools down over the zirconium fire
problem. You have to have some of that old stuff in
there because it's way safer to have the old stuff in
there than not.

Okay. So then I just -- one more thing to be
sure to point out. We reviewed PG&E's schedule for that
transfer of the fuel from the pools to the casks a
couple of times in the last couple of years and it made
sense to us from a safety point of view, that is we
were -- our committee was comfortable and we wrote it
down, we had public meetings and stuff, that it was --
that that's -- that the safety of that was adequate for
us, but about a couple months ago now, PG&E in their
filing, in that triennial filing, produced a different
schedule than the one they had before, and probably
you're aware of it, but, anyway, I won't go into detail
about it, but it stretches out the schedule and that
schedule keeps more stuff in the pool longer than the
previous schedule and, therefore, it transfers less to
the casks until later, and just to tell you where we
are, our -- that only happened in January. Our
Independent Safety Committee has not reviewed that, it
has not reviewed the safety implications of that and
what we're interested in is the safety implications over
the next six years because remember our charter is six
years long, six years from now, 2025. Whether there's a
safety issue over the next six years with keeping that
rather than transferring, because they were going to be
transferring some of it, it's something we haven't
looked at, but we're going to look at very soon. I'm,
going to actually be back at the plant on Monday and
Tuesday for a fact-finding meeting and one of my
colleagues is going to be back a few weeks later with
one of our consultants and in that time we're going to
look at that and see if we can understand what the
safety issues are with that, if any, and what it means
and then we're going to talk about it at our public
meeting in June.

So we haven't looked at that, but my general
feeling is that either of those schedules is adequately
safe, that is, there's just a lot of safety margin, and
that -- which is comforting. Okay? On the other hand,
for sure, the casks are safer. Okay?

I mentioned briefly about leaking fuel. This
plant has had a remarkably good record on fuel integrity. It's one of the best plants in the world on fuel integrity, just a few little leaking pins over the years and they're in the pools and they're going to have to be encapsulated before they go up into the casks sometime years after -- towards the end of this campaign. We've looked at that. We don't think that that technology is a problem. It's been used elsewhere and we're comfortable that that can be done before -- in the water before it gets put up in the ISFSI.

So now I do want to talk, though, about one major problem that's a concern anyway with the casks and that is those big casks have a steel -- the inner one is steel. It has 32 assemblies in it and then there's concrete and then there's the outer one and steel corrodes. Okay? So there's a concern especially because this is a marine environment, there's salt out there in the air and the salt -- you know what -- you live here. By the way, I live near the bay and I understand it, too. That salt can cause corrosion, and you probably heard about this. I'll just tell you our committee's view. We reviewed that issue a couple years ago and we looked at it again recently and our conclusion is that that's a concern, but it's a very, very slow process, meaning it's not weeks, it's not
months, it's years, if not, multi-years, meaning a
decade or more. There's a long, slow corrosion process
and I -- Mark Mayer said he's going to maybe talk about
this, so I won't go into it, and we've looked at that
and we think that that's adequate for now, provided they
continue to monitor, and we're monitoring to make sure
they do when they do, and, in any event, if there were
to be a corrosion problem, there is a design already in
place to take that thing and take it out and inspect it
and put it in another one if they had to. It's that
facility just at the top of the hill before you get to
the dry cask storage facility itself. They can remove
it and repack it. It's feasible. It's going to take
some care, it's going to be expensive, but it's
certainly not a problem.

And then to answer your question. The panel
asked me a direct question, gee, should we keep one of
those pools around even after in case, and we don't
think so. Okay? We don't think that's necessary. The
technology for doing it -- it will be cold stuff and so
it doesn't have to be underwater and we don't think that
that's something that's necessary. You might do it, but
it doesn't add much to the safety. Okay?

And then there's another crucial thing before I
move on to a couple other things and that is ultimately
this stuff is going to go in transportation casks to a place like Yucca Mountain or maybe it's going to be in the east or who knows where it's going to be, I mean, we don't know, but some place it's going to be disposed of and it's not going to be disposed of on this site right here. It's going to be disposed of somewhere else.

The transportation casks that are envisioned for that in which have already been designed and tested and licensed and all that stuff can take radioactive leaker stuff in them because they're sealed against that even if it was so, which it won't be. Okay? So that's an additional safeguard -- engineering safeguard and our committee's looked at that and we're comfortable with that technology. Okay?

Just want to move on. So now I've got a few other things you asked me and I'm going to see what I can say about it. The panel asked me -- asked us to talk about whether a consolidated spent fuel storage facility some place else -- for example, there's one in Texas that's seeking a license from the NRC and there's one in New Mexico that's doing the same thing. It hasn't happened yet, but maybe. It's called a consolidated -- they would take fuel from many reactors. Whether that would be -- the safety would be comparable to the safety up here and the security, too. We haven't
looked at that. Nobody asked us to and it's outside of our remit, but the general feeling in the engineering community is that the safety would be comparable, but the security would be comparable, too, but way cheaper, way cheaper.

Imagine you have to have guards at Humboldt, just guarding, costs money for those, what, three of them or four of them. If it was in some consolidated place where there's hundreds of them, the guard force is way cheaper and way more efficient. So the security is cheaper and the consolidation would be comparably safe. That's the general feeling in the whole engineering community. Our committee hasn't looked at that, particularly. Okay?

I've just got a couple other things to mention here and then I'll be done. The risk in the pool does depend on the loading and it depends on the density of the loading in those pools. I mentioned before that if you have a release, it's more or less proportional how much spent fuel is in there because of the big radionuclide of concern is caesium and it's -- it's just pretty much proportional; although, there's a 30-year decay, but after just a couple of years, the risk of the zirconium fire goes away and then the rest of it is you lose the water and you've got a few days to put the
water back in and so that looks comparably safe.

So the risk is different depending on the
loading, but it's very small and it's not very
different. That's a way of saying it. It's small, it's
different, but it's not very different. Okay?

Finally, to talk about corrosion, one of the
concerns that we have had, that PG&E has had, the whole
industry has had is the concern about how you go about
measuring the corrosion of these steel things in those.
When the corrosion is very, very slow on the surface and
takes a long, long time in trying to understand how you
measure that very early corrosion process as it's
beginning because of salt is a difficult engineering
problem.

Fortunately, the industry has been working on
it for a long time and have technologies that they have
been developing. This is an electric power search
institute and there's some work overseas and those are
going to be tried out and tested soon in the next, I
don't know, months or year and we're going to watch it,
too, and if those technologies are actually shown to be
as efficacious as we hope they will be, then being able
to make those measurements in those things will be far
more effective and helpful than if they can't. Okay?

In which case, if you really were worried about it, you
probably have to -- you definitely have to take one
apart and look. We don't think that that's anywhere
near in terms of the time frame coming up -- coming on
us soon.

So I'm going to summarize with a couple of
points I want to be sure to emphasize and that our
committee said. It is definitely so that the safety of
the spent fuel in those casks in the ISFSI is safer than
it is in the pools, but they're both really quite safe.
We've said that, NRC says that. I can't think of a good
metaphor. You know, it's -- it's just that there are a
lot of other risks and it looks like that's a real low
possibility; although, PG&E's got to be doing it to make
sure it stays low, which means they've got to do this,
they've got to do this and they've got to do this and
somebody's got to check on them. That's what we do.

And then, finally, I've said our committee
hasn't looked at security, it's outside of our remit,
but our feeling is the pools are highly secure and the
casks are way more so, just way more so, in part,
because if an adversary compromised one cask, it's a lot
of radioactivity, it's hard to do than compromising one
pool. That's important for you to think about.

And, I guess, with that, I'm done. I'm here to
answer any questions you might have and -- oh, wait. I
can answer one more question that you asked me. If there was water in those casks inside, inside the -- wouldn't that increase the risk of corrosion? Well, yes, but, in fact, before the -- the MPC30 -- before the thing is loaded, it's cleaned out and dried out with a helium dry-out to make sure there isn't any water in there and then it's sealed up and welded shut and everything and no water in there. Okay? I mean, that's just -- okay? Provided it remains -- it has the integrity it's supposed to have and you have to look at that to make sure. So you asked that question. That was a simple thing to answer. I think I'm done. Okay?

MR. ANDERS: Thank you, Dr. Budnitz. We have about 15 minutes for questions and answers. So anyone have a question? Sherri.

MS. DANOFF: Okay. I'm wondering if the dry casks should be disassembled and inspected after a certain number of years. You said it's definitely too early now.

DR. BUDNITZ: Well, the NRC -- just to say -- probably you know what I'll say. The NRC gave these installations a 20-year license not because they will last 20 years, because they said at the beginning they wanted to not give them a longer license because they wanted to have the opportunity to reevaluate whether or
not extending that made sense case by case, site by site, plant by plant. So far, they've extended each one that came along. Diablo is up for that in another few years, I suppose you know, and the general engineering consensus is that that's something that is not upon us now and won't be for a decade or quite a while, but ultimately it might, depending on whether or not -- by the way, some of these some day is going to have to take some of these apart. I'm not sure when, but -- or maybe should, it will be long after me, and look and see, and if there's trouble, then, at that time, yeah, you've got to have to think hard about repackaging, but it's been too short a time to see much, and even if there was a little bit, it's too short for it to compromise anything. Okay? Which is -- by the way, it's not just nice to know, it was by design. The thing was designed for this long period without much, if any, trouble, and that was known going in. Okay?

MS. DANOFF: Thank you.

MR. ANDERS: Linda then Kara.

MS. SEELEY: Thank you for coming tonight. Your presentation was very interesting. I do want to remind you and everybody else in this room that this is March 13th, 2019.

DR. BUDNITZ: Yup.
MS. SEELEY: On March 11th, 2011 --

DR. BUDNITZ: It was only -- it was just eight years ago.

MS. SEELEY: It was just eight years ago that Fukushima melted down in an earthquake that was unanticipated. They thought it could not happen there and you -- they thought it could not happen there because it had the design of -- that nuclear power plant was such that it could accommodate the highest possible earthquake that could happen there. Unfortunately, a bigger earthquake happened than had ever been anticipated. So --

DR. BUDNITZ: Do you want me to talk about that?

MS. SEELEY: No, I don't because it's a big topic, but I just want to keep that in our minds because what I'm saying is that when you say things with certainty, like you said an earthquake that big is not going to come along, when you said that about according to the seismic analysis, but I just -- you know, things happen that we don't anticipate. Even though the possibility is very tiny, the consequences of it can be immense.

DR. BUDNITZ: But I need to explain something to you and everybody. The earthquake didn't cause that
accident. The tsunami did. Now, it's really important to understand. The earthquake was 80 miles offshore, something like that, but, nevertheless, on shore it was the largest ground motion ever experienced in Japan, onshore 80 miles away.

MS. SEELEY: I know that.

DR. BUDNITZ: I know. I know you do. And those of you that don't, now you do. The seismic performance of that station and of the nearby station called Dai-ni and of the nearby station called Onagawa worked just a design with this huge, huge ground motion. At Dai-ni, there wasn't a seismic failure of any equipment. We can inspect it now, and at Onagawa, too, and it's been inspected and you can go and look.

Now, at Daiichi, which is the plant that had the trouble, you can't inspect it, it's too radioactive, but for the first 45 minutes, its best understanding is everything that functioned the way it should, except the loss of off-site power, the grid went down and it was the switch arms. It wasn't the grids, it was the switch arms. Okay? But everything functioned as it was supposed to in the largest earthquake ever to occur in Japan and way above the design basis.

Well, here, here, the things that start getting in trouble are even bigger fraction percentages, bigger
than that earthquake in Japan. That is -- the equipment
and the structures and everything out here, and I've
reviewed it, that earthquake that might compromise them
is way, way higher than this plant's been designed for
and there's one heck of a lot of margin and that's
important to know, as happened in Japan. What got them
was the tsunami and that's really a terrible story,
which I don't want to get into here because it's off the
subject, but, you know, they just -- and 16,000 people
died because of that, not from the plant. 16,000 people
died because that tsunami came in and killed all those
people. It was terrible. The Japanese just totally
missed that, which troubles a lot of people. So we have
to be humbled about that, but, in fact, the earthquake
safety of this plant is really very strong.

MS. SEELEY: I know and I'm glad.

DR. BUDNITZ: I am, too, by the way.

MS. SEELEY: I am very thankful for that and
there are things that happen that are unanticipated.
That's all I wanted to say, but I want to ask you a
couple of questions.

DR. BUDNITZ: Sure.

MS. SEELEY: How -- you said that they can
monitor and inspect the canisters.

DR. BUDNITZ: Well, right now, every electric
power service is developing a technology, which, if it
proves out, will make that feasible commonly, but right
now, right now, that technology is not available.

MS. SEELEY: So --

DR. BUDNITZ: Okay. So right now --

MS. SEELEY: -- we've actually employed a
technology to store the nuclear waste for which we have
no way to inspect it, then we're having faith or
whatever that it's going to be okay?

DR. BUDNITZ: You've just explained it
perfectly. The process is so slow that the NRC gave
20-year licenses in order to say, well, maybe we're
going to have to look at it then. They've done that and
they say still so slow, we'll give them another 20
years. Not here, but other places because it's slow,
but if, ultimately, the concern appears, they're going
to have to take them apart and look at them, unless this
technology for in situ inspection is developed and
deployed. So, in fact, you're right. They were
deployed in these things before a routine inspection
method for the whole thing was available. Absolutely.

That's a fair comment.

MS. SEELEY: Okay. And then one more question
about the hi -- you said the, quote, "hierarchy of
safety is indisputable," when you were talking about --
1 DR. BUDNITZ: I don't know anybody that
2 disputes what I said, that it's safer than they're, you
3 know...
4 MS. SEELEY: It's safer in the --
5 DR. BUDNITZ: In the casks, yeah.
6 MS. SEELEY: -- dry casks than in the pools,
7 but then you said but it's really safe in the pools,
8 too, but it's even safer in the dry cask.
9 DR. BUDNITZ: Yeah.
10 MS. SEELEY: So are you going to make a
11 recommend -- you said you're going to make a
12 recommendation to PG&E about their plan now to put it
13 all into 1,340 --
14 DR. BUDNITZ: We're not sure. We're going to
15 go look at that carefully and then we're not sure what
16 we're going to say, but just to talk about hierarchy of
17 safety, I want to describe something. Okay?
18 MS. SEELEY: Okay.
19 DR. BUDNITZ: I have -- I live in Berkeley. I
20 have driven down here for these meetings and I have
21 flown. Okay? Flying is safer, indisputably, than
22 driving, but when you're driving on 101 and it's freeway
23 all the way, by the way, from Berkeley all the way, it's
24 freeway, if you're not dumb and you're -- you know,
25 driving is safe, too. In other words, I don't not drive
because it's safe. I have other reasons for -- but --
so you can have a hierarchy of safety and still find the
less safe thing to be safe enough for you. Now, I know
people that don't drive, but I'm not one of them.

MS. SEELEY: And people who don't fly.

DR. BUDNITZ: Of course. And, by the way, by
the way, the most dangerous thing I did today was I
walked from the hotel three blocks over here because
when you walk -- I don't have to finish that.

So, you know, having a hierarchy of safety
doesn't mean that the less safe thing is unsafe, it just
means that it's less safe. And, by the way, the other
thing is that the safety in the eye of the beholder is a
really important thing. I might judge something safer
or less and I might judge them both adequate and you
might judge them neither adequate. That's okay. That
has to do with where your adequacy threshold is, but
that's different from the hierarchy which we can agree
on. Okay?

MS. SEELEY: Thank you.

DR. BUDNITZ: That's a really important, you
know, thing.

MR. ANDERS: Okay. Thank you. Thank you,
Linda. Comment from Kara and we've got about five
minutes left and then from Sherri and Frank and Lauren.
DR. BUDNITZ: I'm having fun.

MS. WOODRUFF: Thank you for being here this evening. I have a lot of questions, but there are a lot of us. So I'll narrow them down.

DR. BUDNITZ: It's okay. By the way, I didn't say that our committee is available to your panel at any time to ask us any question in writing or here I am and we'll do the best we can to answer any question within our remit, which is the safety of the plant. Okay?

MS. WOODRUFF: Thank you.

DR. BUDNITZ: You should know that. We're a public committee here. By the way, any citizen here can ask us a question, anybody. Public meeting, send us a letter. You, too. Okay? That's a pledge we made early on and which I'm in firm footing because everybody agrees that we'll answer any question you have if we can.

MS. WOODRUFF: Thank you. So during our two days of workshops, we heard from a number of cask manufacturers and they had different designs. Do you or does your committee have any recommendations on the sort of style of casks that may be more --

DR. BUDNITZ: No, no. We haven't looked at that. It wasn't within our charter or remit to do so because it didn't come up, but it's coming up because if
PG&E has a decision to choose something else, or if that becomes an issue, we'll review it, too, but it --

MS. WOODRUFF: I think that would be very helpful.

DR. BUDNITZ: Yeah, but it hasn't come to us yet.

MS. WOODRUFF: So when it does, please do discuss it and let us know. That would be very helpful.

DR. BUDNITZ: If somebody asks us, we'll do what we can. Even if you don't ask us, we'll do what we can because it's in our charter.

MS. WOODRUFF: My second question is you had mentioned that consolidated interim storage facility concept and I guess there's a few in the works right now.

DR. BUDNITZ: Well, yeah. Those plans have been around for a while. It doesn't exist because it hasn't been licensed.

MS. WOODRUFF: What is your opinion? You mentioned they both might be secure, but if you had to make a choice --

DR. BUDNITZ: Well --

MS. WOODRUFF: -- versus what we have today with two plants in California --

DR. BUDNITZ: The --
MS. WOODRUFF: -- right on the water versus
that --

DR. BUDNITZ: The casks are really safe and
secure, but there's nothing like having it in a remote
area rather than around a whole lot of numerous -- for
example, there are few casks that PG&E has at Humboldt
Bay, Rancho Seco, the Sacramento municipal, too, has
some casks, you know, near Folsom Lake, south and east
of Sacramento. San Onofre has, you know --
consolidating them away from people is better than --
it's a hierarchy and it would be safer, okay, as well as
the security's really good, but it would be cheaper,
too. Okay?

MS. WOODRUFF: Makes sense to me. One last
question.

DR. BUDNITZ: Sure.

MS. WOODRUFF: If you live by the ocean and you
have a car, we drive it in a garage and it doesn't
corrode as quickly, it's sort of common sense, and I
guess one question I would have that didn't seem to come
up during the workshops was if corrosion is an issue for
casks that are sitting by the sea, wouldn't a simple
cheap solution to be to build a structure around those?

DR. BUDNITZ: If corrosion turns out to be an
issue, which we don't know and, in fact, most of the
experts -- I'm not a corrosion expert -- think that it's going to be -- there won't be an issue, but if that turns out to be, then you have to evaluate what to do. That could be one way to address it, but there could be other ways and you have to ask whether that -- which way is less expensive and will last longer and is safer and so there's a whole lot of evaluation that we haven't done. Okay? It could easily be that this process, although it exists, is a century long, in which case there's a lot of time to worry because we hope they will be in some other pad before then, but I've not seen an analysis and we haven't evaluated it.

MS. WOODRUFF: Thank you.

DR. BUDNITZ: But there's some trade-offs.

MR. ANDERS: Thank you, Kara. Sherri and then Frank and Lauren.

MS. DANOFF: Hi. I have a couple of questions. In your opinion, should the dry casks be stored inside of a climate control structure?

DR. BUDNITZ: She just asked that and I said that there's a tradeoff between how rapidly corrosion might be taking place if it's important and other approaches to mitigating the corrosion. We've not seen an analysis of that.

MS. DANOFF: Okay. And then do you know --
this may be something, too, that you haven't
investigated, but would you know whether any casks are
available that can be internally inspected?

DR. BUDNITZ: We haven't looked at that. I
just -- I just don't know.

MS. DANOFF: Okay.

DR. BUDNITZ: I mean, our committee has looked
at the casks here. That's our remit. Okay?

MS. DANOFF: And I have one more, mostly a
comment, but some years ago I read the environmental
impact report that was done for the steam generator
that's been installed and there was a recommendation --

DR. BUDNITZ: Me, too.

MS. DANOFF: -- made, it was a mitigation for
the spent fuel pools, that there be a spray water system
installed, you know, in case there was lost water in the
pool and then a report was distributed to this panel
that I just read today and it made that same
recommendation. So I wonder if you have any thoughts
about that.

DR. BUDNITZ: You probably -- it may be that
report I sent to the panel that came from the national
academy a dozen years ago. That was evaluated amongst
other improvements, and at this plant, it didn't make
enough of a difference. Remember that if you're losing
water, it's because you lost power. If you lost power, that system isn't going to -- you can finish the sentence.

So what you want to do if you get in trouble is you've got to restore that power. That's why they have eight diesel generators and they have to fly one in from Phoenix or whatever and you have several days to do that.

So that system was evaluated at that time and, as I remember, it was thought that its vulnerability would be vulnerable for most of the scenarios in which you were in trouble anyway, which is lost power, which made that heat exchanger pump system not work. Okay?

MS. DANOFF: Okay. Thanks.

MR. ANDERS: Thank you. Frank and then the last question from Lauren.

MR. MECHAM: Thank you. Earlier, the question was raised about the possibility of the Independent Committee to continue through the decommissioning process and I know you said you haven't made a recommendation on that.

DR. BUDNITZ: Yeah, we haven't.

MR. MECHAM: The fact that the three of you are appointed, is that -- is there a possibility that there would be three new individuals on that panel and who
makes that --

DR. BUDNITZ: For sure.

MR. MECHAM: -- and who makes that final determination?

DR. BUDNITZ: Oh, no. For sure. Here's how it works. My term is coming up. It's every three years. I've had four of them and my term is coming up in June and a public process took place in January -- in December, January in which the Public Utilities Commission advertises for anybody in the world that's qualified can apply and there were two other people that applied besides me and the attorney general will make that choice because I'm the attorney general's -- this is the attorney general -- now, if we were to become exclusively concentrating in some later time on spent fuel issues, you probably want to have -- all three of us have real deep expertise about that if that was our scope. Right now our scope is much broader. It's the whole of reactor safety, which is a whole lot of stuff, which is you want people with that background.

MR. MECHAM: Thank you.

DR. BUDNITZ: But that's still -- that's still -- not only is it a bunch of years in the future, but that stipulates there will be a change in the charter and I can't tell you about it. We just...
MR. ANDERS: Thank you, Frank.

DR. BUDNITZ: And even if we recommend it, we don't know what's going to happen.

MR. ANDERS: Last question, Lauren.

MR. BROWN: Dr. Budnitz, in January we had two full days of workshops.

DR. BUDNITZ: I know. I wanted to come, but I couldn't. I was out of town.

MR. BROWN: We heard a lot of interesting information and out of it we ended up with a bunch of questions --

DR. BUDNITZ: Yeah, I know. You asked them.

MR. BROWN: -- and you have taken a good run at giving us valuable comment on that.

DR. BUDNITZ: Thank you.

MR. BROWN: I want to thank you for that.

DR. BUDNITZ: Thank you.

MR. BROWN: And I do have one question.

DR. BUDNITZ: Go ahead.

MR. BROWN: One of the issues that has come up is how rapidly should the spent fuel be moved out of the pools into dry storage --

DR. BUDNITZ: You bet. That's a big issue.

MR. BROWN: -- and in one of the reports of the NRC, I saw that there was some concern that if it moved
out too soon, that the temperature of the spent fuel rods would increase a little more rapidly and --

DR. BUDNITZ: In the event of a loss of water.

MR. BROWN: Yeah. I mean, the water goes away once you move it into the dry cask.

DR. BUDNITZ: No, no. Yeah, but you're talking about the pools?

MR. BROWN: No. I'm talking about when you finally do move it into the dry casks, the water, of course, is not around, so you're depending on passive cooling and what -- the issue is if you move these rods out too soon or faster, that there's more heat generated and could have a negative impact?

DR. BUDNITZ: So, first of all, the NRC has a rule that it's got to be cool for five years, by which time, the passive cooling would work even though nothing here is that young, it's all been moved much longer than that. Okay. So even if it was moved in a shorter time than they're planning, the passive cooling would be effective enough.

MR. BROWN: Okay.

DR. BUDNITZ: Okay? Does that help?

MR. BROWN: Thank you.

MR. ANDERS: Thank you. Nancy has one quick question, then we're going to move on.
MS. O'MALLEY: Quick question. I just want to make sure I really understand risk here about the spent fuel pools. So if there's an increased density in the pool, it does increase risk in the event --


MS. O'MALLEY: -- increased density of fuel assemblies in the pool, it would increase risk in the event that the water evaporates and there's a fire, but having increased --


MS. O'MALLEY: No? Is that not true?

DR. BUDNITZ: No. Keep going.

MS. O'MALLEY: I'm just trying to understand the thinking here, but by having a larger density of older fuel assemblies, it would increase the time to ignition if the water did evaporate?

DR. BUDNITZ: Well, it's not -- yeah. Let me say it's a trade-off. Keeping more stuff in the pools makes it less safe than if it was in the casks, but keeping that old stuff in the pools makes it more safe against the accident we fear, which is the loss of water, because the heat-up of the thing would be slower because of all that extra mass. So there's a trade-off between more and less safe in this decision.
MS. O'MALLEY: But if it did heat up, it would be worse because there's more material --

DR. BUDNITZ: Yeah. If ultimately you really couldn't do anything and it did, then there would be a larger what we call source term. There's more of the radioactivity is now there than would have been up there.

MS. O'MALLEY: And then there's also the risk of the number of years that fuel is in the pools rather than in dry storage. So --

DR. BUDNITZ: Yes. The risk is --

MS. O'MALLEY: -- is that a good trade-off --

DR. BUDNITZ: Yes. The risk is --

MS. O'MALLEY: -- is that a good trade-off to say --

DR. BUDNITZ: Yes.

MS. O'MALLEY: -- let's do all we can to minimize the number of years that we actually have fuel in the pool --

DR. BUDNITZ: Yes. That's --

MS. O'MALLEY: -- even if it means a higher density?

DR. BUDNITZ: That's the other trade-off. Let me try to explain to everybody. Let's imagine that the accident we're worried about is just plain you lost
off-site power, the diesel didn't start and you couldn't keep the heat exchanger going, and a long time later, days, it finally evaporated. Okay? Now, that accident can take place any day. It's very unusual, but it might start tomorrow or it might start a year from tomorrow. If it's going to be 20 years instead of 10, there's now 20 years for that to happen rather than 10. Yeah. So that's -- right? But -- so that's the trade-off. On the other hand, there's this other trade-off, too.

So there's several different indicators of the safety and the risks that have to be thought about together to decide which is the best balanced approach. Okay? And you put your nail right on -- you put the hammer right on the nail. That possibility, which is, I would say, linear or proportional to the duration, though, is actually mitigated by the fact that if you wait, you know, 20 some -- there isn't any young fuel anymore. Okay? That is after only two or three years, and ten years later, ten years, it's 2025, in 2035, the youngest fuel is ten years old and, therefore, if you waited a real long time, and there are plants that are doing that, as I suppose you know, there are plants that are going to wait 50 years, that risk, although it continues, is reducing each year because of the decay and the source term and the heat.
So there's a whole bunch of different positives and negatives to balance to make that judgment. That's a very fair description of different people having different values, even though it's really all -- it's quite safe. You know, this isn't -- this isn't an accident waiting to happen tomorrow. It might, but we don't think it is.

MR. ANDERS: Thank you very much, Dr. Budnitz.
Thank you for traveling all this way.
DR. BUDNITZ: It's not so far. 25 minutes in an airplane.
MR. ANDERS: Thank you.
DR. BUDNITZ: It took longer than that to go through security.
MR. ANDERS: Our next item on the agenda is to hear from PG&E, and to start us off, Tom Jones is going to discuss an overview of PG&E's spent fuel storage strategy and schedule.
So, Tom, you're going to speak from what we call the pit down there?
MR. JONES: Yeah. So my partner, Mark Mayer, and I will both be down here to address panel questions. So I'll be talking about some of the regulatory components that got us here today, and then Mark Mayer, for those in the audience, he handles all of our fuel
programs, both how we procure the fuel in its composition and its disposition at the plant, how we store it, and he runs our dry cask storage program, as well. He's a recognized expert on that and he'll be here tonight to talk about some of those strategies and these areas of opportunity as we embark upon pursuing a request for proposal for some modification to our system to overall reduce the time in the pool and the way we handle the fuel.

Okay. So the purpose tonight for our presentation is to describe our current spent fuel storage system. We've updated, based on the panel feedback, our public videos that explain how we manage the fuel and it's now all in high-def and it's quite easy to see. I think you'll find that we have a truncated version. The panel's seen a 15-minute version. This is about a 3-minute condensed version. Both will be moving to our website and it's also available for the public tonight in our exhibit room just outside of the main doors here, and then Mark's going to talk about the next steps in the process and how we'll look at addressing these complex issues that you've tackled so far tonight.

So Adam's going to go ahead and cue up the video here for us. It will be about a three-minute
video here, maybe four.

MR. MECHAM: Do we get popcorn?

MR. JONES: No, you do not.

(Video played.)

MR. JONES: So that's the CliffsNotes version of that, and the other version, of course, is available outside, but thanks to the panel, also, for some of your feedback and we incorporated that in the video with the numbers and to scale of the video imagery.

What got us here and where we're reevaluating some of the times, there are two regulatory events in the State of California. One was through the joint proposal where we have an agreement to look at benchmarking San Onofre's used fuel storage, and at the time, their estimated completion was seven years. As we know, they've had some fuel-handling events that have changed their time frame and we're still following that and our team, including Mark, work closely with them and that's an industry-wide watched event.

Additionally, once we've come up with a plan, it's to then be shared with the Energy Commission that's begun and we have an ongoing plan with the Energy Commission including a tour currently scheduled for them for April 4th to go through the facility and then give us some of their input to be included in our
request for proposal on some new or modified system.

Additionally, in the previous Nuclear Decommissioning Cost Triennial Proceeding, it was the 2015 proceeding that was ruled on in 2017. The decision was it's reasonable for PG&E to look at seven years versus ten. Our current technical specification in our license on average has about a ten-year storage time in the spent fuel pool before it's loaded. Mark's going to go into some of the reasons behind that. The regulations might change, our licensing might change, but the physics doesn't and so his team has to do, essentially, a custom blend on every cask that's loaded to balance the heat and radiation levels.

So it's these two events that now have us contemplating how to make some modifications to the system to lower overall loading times and potentially change its configuration, and so with that, I'll hand it over to Mark.

MR. MAYER: Thanks, Tom, and good evening, everyone. What we're looking at here is our initial assessment of what -- well, what changed with trying to go to a seven-year offload. If you look right here, these are the old curves that we used to have in our earlier submittals. This one looks at our current plans, which would basically leave all the pool alone...
until we reach the ends of our operating license and then let everything cool off and offloaded everything at that point in time.

One of the things that come out of that will be a choice of another cask because our current cask limits do not have enough flexibility in the license requirements to allow us to offload that quickly. So like Tom was talking about, we’ll be looking at a request for proposal from the three vendors to come up with a more up-to-date, more capable cask design.

One of the other things Dr. Budnitz did a nice job of covering was the decay heat dispersal. So the requirements that we have for trying to disperse decay heat to share that decay heat among colder assemblies with one hot one requires us to basically keep four colder assemblies, four assemblies that have been in the pool for at least a year so they've had a chance to substantially reduce their decaying. For every hot assembly that we discharge, it's a requirement that if we are going to leave the assemblies in the pool for more than 60 days, we have to distribute these assemblies to basically share that heat-up so that it slows down the overall heat-up of any fuel that would be in the pool and that's a mitigative strategy that the NRC refers to as B5 Bravo.
So if we were to do a full core offload at the end of life, for example, you know, it's going to sit there for more than 60 days. So we would have to have, basically, the 772 assemblies that you see here on this line.

The previous campaigns that we had planned had us dipping a little bit below that on a couple of our campaigns when we would offload fuel from the pool into the dry cask storage. So we would dip down below that a little bit and the issue there would be is if we would have a refueling outage, we would basically have to credit the new fuel, the unradiated fuel for those additional decay heat dispersal requirements, should we have to leave the core out of -- the containment out of the reactor for extended periods of time. So it's okay to go a little bit below it as long as we would have new fuel to share that e-load. So, basically, you've got an assembly that would absorb all that heat, but it's not generating any of its own.

So we were talking about the request for proposal from the three vendors. So what you see here is basically what you could characterize as an area of opportunity, this green area in the graph right here. So you see the green block, that's basically the underside of what we expect the worst case to be, to get
down to that seven-year offload time. If we were to find a cask vendor that could substantially improve on that, we could conceivably start offloading sooner and trim a lot off of that green area. So that will be one of the key items that we'll be looking at when we look at our request for proposal.

Moving along. So you guys have seen the casks up on the hill and so you know that we use the empty C32. So that's a canister that can hold 32 assemblies. It has a number of restrictions. It's -- in our license, it requires our fuel to have at least five years of cooling and there's a set of intricate relationships that we have to meet to make sure that those fuel assemblies meet the right combination of burn-up, decay time, decay heat, right? We don't want to put too much decay heat into a canister because it's not designed to dissipate that kind of heat. Our calculation requires us to be less than 62 gigawatt days per metric ton of uranium. We have to keep our decay heat on the hot assemblies down below 1.1 kilowatts, 1,100 watts. That's for the design with the two color, the two region up here. So the inner assemblies could be at 1,131 watts. These outer ones have to be below 600 watts, and so that's -- the question has come up why do we need cold assemblies to go with the hot
assemblies. So these would be the hottest assemblies that we could ever discharge under our current license, and so for every one of these, we need basically one and a half cold assemblies, and when we get down to 600 watts, we're talking about something that's been sitting in the pool for quite a few years. Not five years. We're talking, like, 15 years, 20 years. So for every one of those red assemblies, I have to come up with a couple of blue ones and it has to be really decayed.

The other alternative is to go with what we call a uniform loading pattern. That one allows you an intermediate amount of decay heat. So in our case right now, it's 898 watts and we could go and load the whole cask with those, but that takes a large population of our fuel out of the picture because they haven't decayed down to that 898 watts. So those red assemblies in this region are typically too hot to meet the requirements for the uniform loading.

So there are assemblies that would have to remain in the pool potentially for extended periods of time. If I don't have enough of these light blue ones, then it's going to have to sit until some of the other fuel assemblies make it to that light blue category.

Timeline. So what we're looking at is for RFP, we're expecting, to issue the request this year.
So we'll be talking to the vendors, getting an official letter out to request that proposal.

Let's see. Where are we talking here? So we've done our dry cask storage workshops, right, Tom?

MR. JONES: Correct.

MR. MAYER: So we're going to get ready here to -- well, we're talking today, actually. This is the engagement panel meeting. We'll be evaluating feedback and updating our RFP based on any inputs, any considerations that get brought to our attention, we'll hold a CPUC case workshop in April and then our decommissioning team will be looking at starting hearings for our NDCTP, our triennial proceedings for the nuclear decommissioning costs.

A little later on in the year, we will actually issue that request for proposal and we'll get the offers back from our vendors and then we'll start our evaluation. The current schedule has us issuing our purchase order sometime in the 2021 time frame. In 2021, we'll have our next triennial proceeding for our decommissioning costs. Somewhere in that time frame, we'll be looking at doing the design, the licensing and the permitting required to change out the storage systems because right now we have a license for, basically, a single system and that system doesn't meet
the expectation of seven years. Then, obviously, in late 2024, Unit 1 will shut down, and at the end of the summer in 2025, Unit 2 will shut down.

So confirming here. So it's definitely -- and you heard Dr. Budnitz talk about safety. It's safe and feasible to offload our fuel after about seven years. We've gone through enough evaluations and looked at the offerings from the three vendors and we're comfortable that all of that can be accommodated in that seven-year time period.

There is a significant amount of additional engineering required to deal with our Greater Than Class C Waste. There's a very strong effort in our decommissioning team out there right now trying to get their hands around that problem and make sure that it stays manageable. Obviously, one of the considerations will be where do we store it and we may actually have ability to store more stuff on the pad with a new system. So it may also help us accommodate our Greater Than Class C Waste storage and disposal.

Further expediting could be achieved and driven by responses to our RFP process. So we'll be able to take advantage of the vendors' willingness to work with us to come up with a better system.

Additional loading campaigns ends up dealing
fuel transfer to the ISFSI and it can commit additional spent nuclear fuel to dry cask storage design. It's -- basically, it's not necessarily better to keep on emptying the pool now. It could be better to leave it at the end. That's our current feelings. We need to have those blue assemblies rather than just purple ones.

And then the NRC licensing is going to have to be looked at again. Right now we have a site-specific license. Changing vendors and systems, potentially, we could look at a site-specific license still or we could go with a current Certificate of Compliance. There are a lot of licensing aspects of that that need to be evaluated to determine what the best course of action will be.

Our current action plan. So we'll be doing -- well, we've included already in the triennial proceedings estimates what we think the cost estimate will be for the seven-year offload schedule. The RFPs will be upcoming after we talk to the California Energy Commission. We'll be, obviously, working with the engagement panel to try to make sure we get the best answer that we can and we'll make sure that we also touch basis with any affected stakeholders.

We anticipate offload schedules will be less than seven years, like I talked about our area of
opportunity. So we would like to trim that as much as everyone. And let's see. In 2021, we'll be updating our cost estimates based on what that RFP evaluation looks like and which system we decide is optimal for our case and then we'll be pursuing the appropriate licensing actions, either a license amendment request or other regulatory reviews and approvals for an updated system.

And with that, I'd like to say thank you for giving us the opportunity to speak to you guys and present this information. Tom.

MR. JONES: So we're available for any questions that the panel might have.

MR. ANDERS: We have opportunity for a few questions. Lauren, Frank, Scott, Alex, Nancy, Kara.

MR. BROWN: Mark, I just want to clarify. The main driver for looking at a new dry cask is to reduce the period of time required from ten years to seven years? Is that the main driver?

MR. MAYER: Lauren, that's definitely a key driver. I don't know that I could qualify it as the main driver.

MR. BROWN: So what are the other drivers?

MR. MAYER: Obviously, one of the big drivers will be just being able to decommission the plant. So,
yes, shortening from ten years to seven years will help
us in that respect. The other driver, in my mind,
anyway, is the regulatory requirements. Because of the
way our current license for our ISFSI is written, it's
conceivable that we could have to hold stuff for a lot
longer than even ten years. It could go up to, if I
remember right, 13 years depending on the combination of
inserts and fuel that we end up with in the last cycle.
So it increases our flexibility in our long-term
planning.

MR. ANDERS: Okay. Scott.

MR. LATHROP: Next? Okay. Great. I was kind
of wondering about the pool itself, the number of
assemblies that actually can be in the pool at one time
and I was kind of curious about whenever you load the
pools for the last time, how many assemblies would
actually be in the pool at that time.

MR. MAYER: So I'd have to dig up the numbers
for that, but the pools are licensed for 1,324
assemblies. The final estimate -- and this is me
remembering off the top of my head -- there will be
roughly 40 or 50 empty spaces in the pool when we
finally offload that last pool.

MR. LATHROP: So pretty much --

MR. MAYER: So somewhere around 1,280 or
MR. LATHROP: Okay.

MR. JONES: And I would just add that's if the RFP doesn't give us a cask that's with a licensing path where we can still load in the 2024-2025 period. So when Mark talked about that area of opportunity -- if Adam can bring back up Slide 14 -- this doesn't necessarily preclude loading. What we've just forecasted is moving the entire bookend from ten to seven years, and depending on the speed with which we can license and acquire technology, an existing technology and existing Certificate of Compliance, there could be the opportunity for some activity prior to 2025. It's that blend he has to come up with.

MR. LATHROP: Yeah. I think I understand. What I was kind of interested in is that whenever you load the pool for the very last time, if the hot fuel, the new fuel has to stay in a certain amount of time, five years, seven years, whatever it is, I was just curious about how many other assemblies need to be in the pool at the same time because that kind of addresses the issue of risk as far as the numbers at least in the pool.

MR. MAYER: Okay. So as far as what has to remain in the pool, after a year of cooling, we don't
have any decay heat disbursal requirements for the B5
Bravo. In the first 120 days, we have to have four cold
assemblies for every hot one discharged. It forms like
a plus, a plus sign, and you can't share heat sinks.

MR. LATHROP: So after a certain amount of
time, you can start taking assemblies out, is what
you're saying?

MR. MAYER: Right.

MR. LATHROP: And they don't have to stay in
there for that whole period of time of five years or
something like that?

MR. MAYER: That's correct. So at 120 days, we
have to be in the plus. After 120 days out to a year,
then we have to -- we can share more. So at that point
in time, we could start reducing the number of
assemblies.

MR. LATHROP: And that's just a matter of
schedule how many you can take out at a time safely?

MR. MAYER: Right. How many you can take out
safely and there would be, also, project logistics. It
would be tough to load three casks down and stand down
and then a year later start up and load another ten
casks and then stand down and then five years start this
big campaign.

MR. ANDERS: Thank you, Scott. Frank and then Alex, Nancy, Kara, Linda. Did I miss anybody? Okay.

MR. MECHAM: Just quickly. If -- and it's a great big if -- a consolidated site was established, let's say Yucca Mountain didn't get going, are the casks that are currently there, are they capable of transport, and the casks that you're going to be going out for an RFP, will they be designed for transport?

MR. MAYER: So I'd have to dig out some information for you on that one, Frank, but what I remember is our current cask, we would have to go to a new cask using our NPC as a core and use that for shipping. The newer ones, I think, have shipping modules, or whatever, that go with them that are already qualified. I can find out and I will get back to you on what the current --

MR. MECHAM: Thank you.

MR. MAYER: -- shipping requirements.

MR. MECHAM: Appreciate it. One other question, if I could. If, for some reason, we had a problem with one of the dry casks that are already up there, what's the procedure for removing that and getting it back into a spent pool?

MR. MAYER: So that would require some writing
of new procedures, basically. We don't have an active
procedure that allows us to just go in and immediately
execute it. We would have to work out the details and
get --

MR. MECHAM: I guess it would be dependent on
what the problem was?

MR. MAYER: Right. So we don't have a canned
procedure on the shelf that we could just go and pick it
up.

MR. MECHAM: Okay. Thank you, Mark.

MR. ANDERS: Thank you, Frank. Alex.

MR. KARLIN: Yeah. Thank you. Thank you,
Mark. I just think the public ought to sort of --
here's my synopsis of, I think, what has occurred and I
think it's worth recognizing. From 2009 to the present,
PG&E has offloaded 58 casks onto the ISFSI in seven
separate campaigns. So that averages, you know, 5.8
casks a year over the last ten years. They've offloaded
already and this is good because you have a pool with
casks in it and they're trying to remove casks and get
the total amount in the pool less. Also, there are
additional casks being added as the plant operates.

PG&E, as I understand it, has unilaterally
decided to halt that offloading campaign and they are no
longer doing that and, instead, they are proposing, it
seems to me, in their triennial submission to let the
cask -- instead of continuing to offload regularly, let
them build up and stay there until the closure when you
get, like, 1,300 casks in each one of those pools,
1,285, and then leave all of those casks there for
another seven years.

So I don't understand why PG&E unilaterally
decided to halt its offloading campaign that was working
and was reducing risks, but they will tell us, as they
just did, that there are heat issues that make it
difficult, but it's worth noting that high bridge
associates, who is an independent consultant that PG&E
hired for its decommissioning estimate, had four major
issues with what PG&E is proposing and one of the top
ones was they were keeping the spent fuel in the pool
considerably longer than industry averages and I think
this is a problem.

MR. ANDERS: Thank you, Alex. Nancy.

MS. O'MALLEY: Thank you. I have a question
about the final -- the full core offload. So that last
offloading, is that going to be some of the hottest fuel
that you've ever offloaded?

MR. MAYER: The fuel that we will be offloading
at the end of life would be very similar to anything
else that we've discharged.
MS. O'MALLEY: Okay. And so -- and you mentioned that you need -- 772 assemblies will be needed for that, older fuel assemblies will be needed to match that?

MR. MAYER: That's correct.

MS. O'MALLEY: Okay. And if you use the current cask systems, suppose that you don't get a license or, you know, the -- you know, it's not -- the new casks aren't approved and you have to use your current system, how long would it take to use -- to be able to offload or to be able to put these into dry storage, your final offload?

MR. MAYER: If we were to stick with our current license as it's written right now, it would probably take a little over ten years.

MS. O'MALLEY: A little over ten years. So this is really the rate-limiting step for beginning your decommissioning, is that right, or to be able to...

MR. JONES: Can you ask that a different way, please?

MS. O'MALLEY: I don't know. Is this a step that could slow down the whole decommissioning process?

MR. JONES: It is. So one of the things we can do while there's fuel in the pool, regardless if it's, say, two years, five years, ten years, we can remove...
large components from the containment domes, like steam
generators, things like that, but because of the
commonality of the buildings, we can't start the
demolition around those associated structures because
they're adjacent to the spent fuel pools. That's a risk
we wouldn't take. So that's one of the key drivers for
the overall project schedule is that there's still any
spent fuel in the spent fuel pool.

Additionally, that changes a lot of the costs.

So the security parameters from our steam don't change
if there's one assembly or 200 assemblies or a thousand
assemblies. You have to have that profile until that
transfer is complete and where it what we call
ISFSI-only fuel. So if the pool is empty from the fuel,
then that changes a lot of other things and allows us to
move ahead with the demolition.

MS. O'MALLEY: Okay. So it's definitely in
PG&E's best interest to get the fuel out of the spent
fuel pools quickly because it's more costly to keep it
in the pools, as well as it will slow decommissioning?

MR. JONES: That's part of the analysis. In
addition, that's a consumer benefit because the
decommissioning cost is a direct pass-through. There's
not a profit margin in this instance. So that's one of
the reasons we're looking at this, is how does it change
the overall scope of the project and change the project schedule.

MS. O'MALLEY: Okay. And then my last question has to do with licensing. So it seems like kind of a tight time frame. So you have four years -- so it sounds like you put in the purchase order before you know if you have the license or not; is that correct?

It said PO. I assume that meant purchase order. Do you put in the purchase order and then you submit your paperwork for licensing and so then there's four years for them to come up with the design and licensing, as well as fabricate these?

Is that kind of a tight time frame? What do you think the odds are of achieving this?

MR. JONES: We don't offer odds that way. So I'm not going to give you a one and two number, for instance. What I will tell you is the RFP -- I don't think there's going to be some new technology just invented for PG&E and Diablo Canyon. There's an evolution of these casks. Think like going out for a new fleet purchase of vehicles. There might be a 2019 model, but it might have been around for ten years and be updated and licensed.

So if there's -- Mark had mentioned a Certificate of Compliance. If there's one that already
meets our technical specifications, then that can be
down to that fabrication time, which is typically about
two, two and a half years for both the contracting
procurement and lead time.

That's roughly what they are today, correct,
Mark?

MR. MAYER: It's about a year once we decide to
order.

MR. JONES: Once we decide to order. Okay. So
the fabrication is a long lead time, but it's not a
duration of four years. So that's part of what's going
to go into the RFP. We're going to balance all those
things, what's the deliverability, what's the ongoing
support from the vendor and then what's the regulatory
path. So all of these things are going to be
contemplated on top of how it handles the heat loading
and radiation shielding.

MR. ANDERS: Okay.

MS. O'MALLEY: Just one last thing. It is a
site-specific license; is that correct?

Plus, all the seismic constraints, you don't
think licensing will be a problem?

MR. MAYER: Our current license is
site-specific. We don't know if the suppliers will be
able to give us a Certificate of Compliance design that
would meet our seismic. That would be part of the
ing工程 review and assessment. That would determine
whether or not we needed to have a site-specific
license.

MR. ANDERS: Thank you, Nancy. Before we go on
with further questions, we're going to have a quick
break in a few minutes and after that we'll have the
opportunity for public comment. I want to make sure
that anyone who would like to comment fills out a blue
card and gives it to Michael over here so that we have
those cards that we can compile the list at the break
and be ready to go after the break.

So, Kara, question.

MS. WOODRUFF: Thank you for your presentation.
As usual, it was very informative.

So Alex brought up, I think, a very provocative
issue, that a third party commented that PG&E had
unilaterally made some decisions to slow the transfer of
spent fuel from the pool to the cask and it seems to me
that it warrants a response from you because there's a
lot of people in the audience today. Can you respond to
what...

MR. JONES: Yes. This came up at our workshops
and I think we heard from many of the vendors, too, is
every one of those older assemblies is an opportunity to complete the overall campaign quicker. So we know we have that base inventory of 772, approximately, to accommodate the full core offload, and, again, we talk about that area of opportunity. Depending on which technology we pick and what licensing path we have, it doesn't necessarily preclude future operations. What that green line does is that sets the outside limit of how we would handle fuel in the pool and achieve complete offload seven years as encouraged and specified by the Utilities Commission. So that whole shaded area is what the RFP will give us back. So that's why we've made that decision and that's how we're pursuing these other things.

If we didn't change our loading strategies in our system to some degree, we couldn't achieve the seven years, as Mark talked about. So these are some of the steps we feel are necessary and puts us in the best position to handle our fuel strategy.

MS. WOODRUFF: So a big part of your strategy is this checkerboard design where you're matching up cooler assemblies to hotter assemblies, and as I understand it, that comes into play in two ways. Number one, if you have this combination of cool and hot assemblies in the pool and if there should be a
disaster, it gives you greater response time to provide
extra water if the water should drain out, and then the
second benefit of the checkerboard is that you could
possibly contain more assemblies in every canister
because you have the hot and the cold doesn't exceed
those limits that are prohibited by your license; is
that correct, or did I say that wrong?

In other words, the checkerboard isn't just for
the pools, it's also for the cask design and storage, as
well, correct?

MR. MAYER: The purpose of the checkerboards,
really, the B5 Bravo dispersal requirements is to give
us a longer coping time. So it also does have a side
benefit of us having to maintain some additional
assemblies in the pool, but it doesn't require us to
keep as many as all of them to the last day.

MS. WOODRUFF: So the core reason to have this
blend of hot and cool assemblies is if there is a
disaster, you have more time to respond before
catastrophic conditions result; is that right?

MR. MAYER: That would be the purpose of the B5
Bravo requirement, the dispersal, but like we talked
about in -- I think it was Scott's question, that only
really applies for a year. After that, we would be able
to start offloading.
MR. JONES: Adam, if you bring up Slide 15, I think I know where Kara is headed with this. I think the visual is going to help us here. Can you see it?

MS. WOODRUFF: I'm looking at the visual. So this is a canister containing the assemblies, correct?

MR. MAYER: That's correct.

MS. WOODRUFF: And under the top -- in the top canister, you have the hot and cool assemblies, which is permissible because it's under the limits for the license?

MR. MAYER: Correct.

MS. WOODRUFF: And describe the second one for me.

MR. MAYER: So the second one is basically not having any specific regional aspects. So if I wanted to put in, basically, an average assembly where they're all the same, if they had to meet the same requirements, then I'd get what's in purple. So none of them have any higher or lower requirements for decay heat than any other assembly in that cask.

MS. WOODRUFF: Okay. I think I'm going to take some time to ask you more about this later --

MR. MAYER: Certainly.

MS. WOODRUFF: -- but I will ask you what happens if you did exceed the limit? I know you won't
and you can't, but what would happen if you did?

MR. MAYER: If we exceed the limit, that's basically a tech spec violation on our license. So you would --

MS. WOODRUFF: Yeah. I understand. I'm just curious. So there's a limit for a reason. It's not only just to comply with your license, but what would happen? What would be the physical result if you had above the wattage limit?

MR. MAYER: Right.

MS. WOODRUFF: What happens? Does the can crack? What happens?

MR. MAYER: No. You end up with probably just high pressure inside the cask. So what you end up with is more heat. So the gas in it gets hotter and the pressure goes up. Realistically, I wouldn't expect that it would result in a catastrophic failure, but it would put us outside of what we had been analyzed for.

MS. WOODRUFF: Thank you.

MR. ANDERS: Thank you, Kara. We have Linda, David and Nancy. We have just a few minutes before our scheduled break and then our public testimony after that. So out of respect for the public, who has been waiting to talk, I'd request that you make -- we make our questions and responses very concise. So Linda.
MS. SEELEY: Thank you for your presentation.

Three -- I have three questions. One, of the B5 Bravo, when did that start? That's the first thing. Is that new?

MR. MAYER: So B5 Bravo actually came out of the 9/11 incident where they had an airplane fly into the World Trade Center. So the NRC ended up with interim security order B5 Bravo. So it's part of an interim security order that became part of the licensing requirements.

MS. SEELEY: Okay. And then do you think that maybe that the new casks that you're going to get, that they might have a higher whatever that's called, like fuel heat capacity and that's why you think maybe you can offload sooner?

MR. MAYER: So the -- if you look at the current offerings from the three vendors, they have peak decay heat allowables for their hot region, the red region in our design, on the order of 1.7 kilowatts instead of 1.1. So there's about a 50 percent improvement in the peak decay heat. They still have that ring of colder assemblies or regions of colder assemblies that need to go in there. So you still need cold assemblies, but you can put a hotter one in, which means it can be taken out of the pool sooner.
MS. SEELEY: Okay. That's what I thought. And then the third one is when you talked about Greater Than Class C Waste, it seemed you referred to it as being problematic and I wonder -- I think maybe we haven't paid much attention to it because it sounds so benign, Greater Than Class C Waste. What's the problem with it?

MR. MAYER: So, basically, Greater Than Class C Waste is material that's been highly, highly eradicated. It's beyond what you can normally dispose of. So it has to be stored in something like a dry cask.

So like at Humboldt, we have one cask with Greater Than Class C Waste. Here at Diablo, our estimates are -- I think it's four per unit right now, plus a little bit of extra for miscellaneous.

So the question is where do you put those casks, and right now with our current license system, we need all of the spaces on the pad that we have right now.

MS. SEELEY: Okay. And then just one quick comment. I hope that in your request for proposal to RFP that you'll ask for the very finest cask that possibly could be made in the whole world and the ratepayers will be happy to pay for it.

MR. ANDERS: Thank you, Linda. David, then Nancy and then Jim.
MR. BALDWIN: You mentioned one of the major drivers was a more -- I think you called it a more capable cask design for -- I guess for your -- the changes that you want to make to the loading campaigns going forward.

Do the workers that load, they're involved in these loading campaigns both -- I guess they must spend a large amount of time in the fuel-handling building and then on their way up to the ISFSI. Do those workers regularly receive a dose of radiation for that work?

MR. MAYER: So all of the key players in that would be radiation workers. So they follow all the rules and all the requirements that we have for our radiation.

MR. BALDWIN: I understand there's within the limits, I guess should have been part of my question. I'm not suggesting that they would be outside the NRC's limits, but I know, as a former radiation worker, you are allowed to receive certain amount of dose per the job you're doing as long as it's within the limits and what is expected.

So do the workers involved in the loading campaigns receive some dose?

MR. MAYER: Yes, they do.

MR. BALDWIN: And so then my next question is
will any new canister design take into account reducing
that dose or the potential for higher dose should there
be a mishap in a loading campaign?

MR. MAYER: So all of the cask vendors include
in their design any kind of measures that they can put
in to mitigate radiation. So they're designed to shield
the workers the best they can from handling. There is
only so much shielding you can put in before it becomes
too difficult to move or requires a bigger crane to pick
it up. So we have limitations based on our current
plant infrastructure. We'd have to work all of that in
with it, but they will do what they can to reduce
occupational exposure.

MR. BALDWIN: Okay. I hope that will be part
of it. We talk a lot here about the public's safety as
far as dose rates or should there be some mishap, but
there's a whole 'nother group and that's people that
actually work at the power plant that are involved in
this. There's obviously controls in place to make sure
those workers are safe, but if we can do it safer and
there's less dose, that's always the goal, and I would
think if we're going to redesign and go through what's a
huge process, I would imagine, to redesign a cask
system, why would we not make a cask that has less
potential for higher doses for the workers, you know,
and why not make something that's safer for the loading campaign so that the workers receive less dose. If we're going to go through all this trouble of redesigning the whole setup in the first place, that seems like -- as a layman, that seems like it would make good sense to me. If I were loading those casks, I would want to know that that's being done.

MR. MAYER: And that will be a factor in what we evaluate.

MR. BALDWIN: And the second part, I just had more -- I guess it's more of a comment because it's not to do with Diablo, but when I was listening to the video, the narrator mentioned that the ISFSI facility was constructed some 300 some odd feet above sea level, I think, and then they mentioned because of sea level rise or climate change. I can't remember exactly how they worded it. This panel went on a tour of the ISFSI facility down at San Onofre and one of the things I remember is it seemed to be right at sea level or thereabouts.

Does the NRC not require an ISFSI to be built a certain number of feet above sea level?

MR. MAYER: There aren't any requirements that I'm aware of for elevation above sea level. From our perspective, there were distinct structural and seismic
advantages putting it up above our plant.

MR. JONES: And with the San Onofre project, the Coastal Commission gave them an expiration date because of sea level rise analysis. So they have to come back to the commission and monitor the sea level rise and show that if they need a license extension, that they could accommodate those things, but right now they have expiration date on their coastal development permit at that location because of that issue.

MR. BALDWIN: Okay. Thank you.

MR. ANDERS: Thank you, David. Nancy and then final comments by Jim.

MS. O'MALLEY: I have a question about transparency. So it sounds like there are a lot of unknowns and there will be these calculations that will be done to determine, is that correct, when the next offloading will be and the density in the pools and that will all depend on a series of elaborate calculations with many variables. I know that was alluded to in our workshops.

So my question is who provides oversight for that and who do you collaborate with when you do that? Is it the cask vendors? Is it the California Energy Commission? What is the method for transparency and oversight in those calculations?
MR. JONES: So the licensing process will be overseen and administered by the Nuclear Regulatory Commission. They have exclusive jurisdiction over nuclear health and safety. That said, we will collaborate with the Energy Commission and other folks as we inform the RFP, but I see the former judge nodding that the NRC does have that exclusive jurisdiction and at the end of the day the company has to make its best informed decision on how it wants to handle this risk. Some of these things aren't delegable. They can't be given to anyone else. We have to make and accept that decision as a licensee and go through that public process.

MR. ANDERS: Did that answer your question, Nancy?

MS. O'MALLEY: Thank you.

MR. ANDERS: Great. Thank you. Jim, final comments before our break?

MR. WELSCH: Thank you, Chuck. I just -- you know, the little alternative perspective on the unilateral decision --

MR. ANDERS: Stay close to the microphone.

MR. WELSCH: -- I think what's important to know, is we need to make a filing and we also had our engagement panel process and input from officials, et
cetera, trying to make the most informed decision. By making the unilateral decision not to continue loading, it left the option on the table. If we made the unilateral decision to proceed with cask loading, it would take off the table the option of a shorter duration once we shut down.

So from a different view, the decision not to continue with cask loading has left both options on the table. It's giving us time to have this dialogue, seek to understand, build, hopefully, alignment with our community on which path to take.

As Dr. Budnitz pointed out, you know, there's -- I mean, I've said it in private session. Both avenues are safe. There's degrees of safety, but they're both very safe. So we're willing to revisit, we just need the time to gather input and make a more informed decision. I just wanted to be clear that, yes, it was -- you're right, it was a unilateral decision, but we've kept both options on the table by making that decision because we could resume cask loading this year, next year or in 2021 and pick the pace back up and move forward with a plan that reduces overall inventory, but it would take, you know, some number of years longer to actually empty the pool. So that's part of the reason for this dialogue.
MR. ANDERS: Thank you. It is 8:45 and let's take a ten-minute break and reconvene at 8:55, at which time, we'll hear public testimony and comment.

(Recess.)

MR. ANDERS: Great. Well, welcome back, everyone. We have the opportunity to hear from the public now. So if -- I think we've got four people who would like to speak. So if -- if those -- we're going to put up some -- five people. All right. Before we do, I'm going to go over a little bit of information on the metrics we've received so far. We've almost received a thousand public comments through a variety of issues and on a variety of topics. This chart's a little busy, but we've received the most public comments, actually, on the strategic vision plan that was developed late last year and we also received a large number of public comments on public lands and repurposing.

So the opportunity is ongoing for the public to submit comments through a variety of pathways. Comments can be submitted through the online form, which can be accessed at the panel website. It's PG&E.com/EngagementPanel. We've also received comments by email and we've received many comments directly through the panel members where citizens and public
members have talked with panel members and the panel members have passed those comments on. Those are all documented and all part of the record, so -- along with comments that are submitted at your public meeting.

So we want to move forward and hear from the public. So let's go to the next slide. What I'd like is for the people that see their name up here, come on up to the podium. Everyone will have three minutes for comment. So first from Carol.

CAROL: Good evening. Thank you for being here tonight and thank you for this opportunity. We're going to have enormous amount of extremely radioactive nuclear waste by the time both reactors shut down at Diablo Canyon and this is probably the most lethal stuff on the planet, most likely to stay where it is for my lifetime and probably beyond for several generations. This is and will continue to be the biggest problem at San Onofre in Southern California.

So why were there so few residents at the decommissioning workshop in late February, or governmental officials or workers? I was very disappointed and distressed to see there were no elected officials in attendance, either. Congressman Carbajal came to deliver a statement about a bill he co-sponsored to move the waste to interim storage and he didn't stay
for the workshop, nor did Adam Hill, who accompanied
Mr. Carbajal. I wish they had.

Not enough people are paying attention and
trying to educate themselves, given that we'll be living
with this for decades, maybe generations to come. The
workshops that were held in late February have been
taped so you can watch it online and I urge you to do
so. If I sound agitated, well, I am. It's only been
days after the eighth anniversary of the Fukushima
disaster. Fukushima might never have happened if the
community were more engaged, if they had had a citizens'
watchdog group making sure TEPCO was doing the right
thing. If the locals, the residents and the government
were not complacently living with blinders or believing
everything the utility told them, ooh, economic
benefits, ooh, jobs, and now they're paying for their
lack of involvement and engagement big time with their
livelihood, their homes and ranches and farms, their
children's health, their own health, the nation's and
the world's health.

If you'd kept up with the flow of new
information from Fukushima, you would know that the
power plant did have earthquake damage before the
tsunami, but it was covered up for the benefit of the
nuclear industry. More disturbing, the government
issued new data on tsunamis in 2008 and the workers at
Fukushima, they did their own analysis and found out
that they needed a bigger, better protective wall and
they asked their bosses if they could start a plan for
better protection, and in the beginning, TEPCO
executives said, okay, go ahead, but then abruptly
stopped them and they never resumed. The government
didn't find out until days before March 11th. The
executives claimed they never had any knowledge of the
new analysis or the new plans. They're being tried now
for criminal negligence, but it's too late for Japan.

If something like that were to happen here, who
would compensate for the loss of homes? Avila has
mighty expensive real estate. What about the farmers
and ranchers, the wineries, their land, investment,
operation? TEPCO can't compensate all its victims and I
seriously doubt that PG&E will be able to, either. We
need to be involved and stay involved, both the
residents and their elected representatives. We need to
keep probing, not taking what the nuclear industry tells
us at face value. We need to be skeptics. This waste
is going to be toxic for hundreds and thousands of
years. We need to learn the facts and make sure PG&E
makes the right decisions or, since using radioactive
fuel in the first place to boil water I think is a
terrible decision, at least the best decisions. We all need to care before it's too late. Thank you.

MR. ANDERS: Thank you. Next speaker is Marty W., and when you come up to the podium, please state your name and your residence and any organizational affiliation.

MR. PASION: Jane Swanson is the next speaker.

MS. SWANSON: Yes. I'm Jane Swanson, spokesperson for San Luis Obispo Mothers For Peace and I 1,000 percent endorse every word that Carol just said, very much worth thinking of and it ties into the one topic I want to bring up.

At the two days of workshops in February, there were extensive presentations comparing different types of casks and canisters for storing that spent fuel. The information was well-presented and it was valuable. I learned a lot, but the conclusion I drew was that there's no such thing as the perfect canister or the perfect cask. There are issues with all of them related to monitoring, inspections, leaks, corrosion, blah, blah, or how thick the walls of a canister should be. The ones currently used at Diablo are less than a half inch thick; whereas, in Germany and Japan, they are nine inches or more. Lots to think about and debate there.

So I'm asking this panel, and especially
Pacific Gas and Electric Company, to seriously ponder the concept of hardened on-site storage. At that point, you're quibbling over which kind of canister or cask. You do the best you can, but you don't count on them for your total package of protection.

Given that spent fuel is a million times more radioactive when it comes out of the reactor than when it goes into the reactor, it's crucial that this spent fuel be protected from a possible terrorist attack. It's something we cannot rule out in this day and age.

Hardened on-site storage requires that the spent fuel be surrounded by earthen berms or concrete or gravel or something to make them less visible to possible attackers and also sheltered from such an attack.

Given that there is not presently any long-term underground storage for radioactive waste, given that if eventually a repository even the size of a Yucca Mountain one should open, it will only be able to take a fraction of the radioactive waste that's already stored at various reactors.

Given that the proposal for consolidated interim storage is currently merely an idea and it is definitely contrary to federal law because federal law says no fair doing interim storage unless you have a
permanent repository already in place, which we don't, we have to assume that the waste will be stored at Diablo Canyon for decades or hundreds of years or more, we don't know, and given that length of storage, it only makes sense to seriously consider hardened on-site storage.

It would be most -- much preferable to the current reality with the casks grouped together all nice, neat rows and totally visible from the ground, the ocean or the air. Yes, hardened on-site storage would be an additional expense, but given the possible consequences of a terrorist attack, it seems a very worthwhile investment. Thank you.

MR. ANDERS: Thank you. Our next speaker this time is Marty. Marty? Adam, is that the right...

MR. PASION: Yes. So we can proceed with Carolina.

MR. ANDERS: Okay. Who is next?

MR. PASION: Carolina.

MS. VAN STONE: Hi. My name's Carolina Van Stone and I had a question about the little videos. I guess it's from PG&E. I'm trying to understand all of the spent fuel and in the pools and the cask, but when the video was showing how you would load the spent fuel into those square -- the square grid and then it came
above and then it -- you take the water out and then it
looked like they have pipes. They said that there were
pipes going to these canisters loading fuel into those.
Did I totally misunderstand that? I mean, I thought,
wait a minute, I am sleepy, but I don't think I got it
that wrong. So that's a question I have for you, and
that video's not on the little thing out in the front,
is it, the new three-minute one that you made?

MR. JONES: Yeah, it is.

MS. VAN STONE: Okay. I should probably watch
that again.

And then the other thing about seismic safety
and the plant being able to withstand earthquake, that's
one thing, but he -- Dr. Budnitz was talking about the
tsunami. Well, what's to say if we had an earthquake
here that we wouldn't have a subsequent tsunami? That's
just a consideration that I had.

And then the third thing I think that given all
of the controversy with the credibility of casks and if
they're corrosive or this or that, I agree with if --
the hardened on-site storage would be what I would
propose as a public person. Thank you.

MR. ANDERS: Thank you. Adam, who is our next
speaker?

MR. PASION: Is Marty in the room, or no?
Okay. So we did have one comment where the commenter had suggested that their comment be read and that's Bill Woodson from Morro Bay speaking as a private citizen and his three questions is a comment.

So question number one is when and where will security at Diablo Canyon spent fuel be discussed by the panel. Second question is what are the specifics of the San Onofre offloading, time strategy of hot and cold rods, what kind of casks are they using and can they be transported, and then the third question is why is money an issue since the cost of offloading is passed on to the consumer, and that's the end.

MR. ANDERS: Thank you. Any other speakers?

Okay. Thank you very much.

Before we go into our discussion period, Tom wanted to make an announcement.

MR. MECHAM: Excuse me. Are you going to answer the questions that was asked?

MR. ANDERS: Pardon? I'm sorry?

MR. MECHAM: There was some questions. Is PG&E going to respond to those?

MR. JONES: If you're asking us to, typically we don't respond to the questions in public comment. Depends on -- so, Adam, repeat them and we'll go through them.
So I know we're arranging right now to show one of our speakers the video to go over those dynamics in what she thought was a pipe. So we'll take care of that outside the room. Adam, what were the other questions?

MR. PASION: So when and where will security at Diablo Canyon spent fuel be discussed by the panel?

MR. JONES: It's been discussed, but we don't typically discuss a lot about security in public forums and some of it is restricted. It's known as safeguards, and so the Nuclear Regulatory Commission examines the licensee, in this case PG&E, about their security plans and that's done, again, through this process called safeguard. So it's not readily publicly available.

MR. PASION: The second question is specific to SONGS' spent fuel strategies. So specific question was what is their offloading strategy, the time, their combination of hot and cold rods, what kind of casks are they using and can those casks be transported?

MR. JONES: We don't speak for other operators. I do know they employ the whole tech system. I don't know their transportation strategy or their blending, but it's part of their license. We can take a look up and get that back to the panel, but it's inappropriate for me to speak on their behalf this evening.

MR. PASION: The third question is why is money
an issue since the cost of offloading is passed on to
the customer?

MR. JONES: It's still subject to ongoing
issues with the Public Utilities Commission. If, in
fact, it is funded, it still has to be a prudent
expenditure and then there is also the cost recovery on
behalf of customers through the Department of Energy
through the litigation process.

So it's not the top priority, but it's an
important priority, but the safety issues come first,
but funding always matters. You've got to be able to
execute your strategies.

MR. MECHAM: Thanks, Tom. I think it's just
important that questions are answered because if they're
not, then I don't want the public to feel like they're
being ignored. So I appreciate you doing that. Thank
you.

MR. ANDERS: Just a reminder that the process
that we have, we don't get into a dialogue with the
commenters, but if the panel would like to ask follow-up
questions, that's very appropriate.

Okay. Tom, you had an announcement.

MR. JONES: Yes. So since later this
afternoon, the Public Utilities Commission docket
officially reflects the vision panel -- the vision
document from the panel. So I just want to make sure you note that it was received and docketed by the commission.

MR. ANDERS: Mark, did you want to clarify a comment or follow up on a statement?

MR. MAYER: So I just needed to fess up here. Some of our staff pointed out to me that we really do have procedures for taking a cask from the ISFSI back into the pool and that we have dry run that. So we do have a procedure to allow us to do that. Thank you.

MR. ANDERS: Thank you. We have some time now for the panel to have a discussion amongst themselves and I just wanted to summarize -- and that discussion can address anything you've heard here or anything at the workshops or any other topic you want specific to spent fuel storage.

Just a quick summary of the workshops, they were held in February and we had 13 formal presentations each with a substantial presentation and question and answer. We heard from PG&E on their spent fuel storage strategy, we heard from the NRC, from the California Energy Commission, three vendors, one from Germany that I understand, according to Linda, is now proceeding with the NRC to get their cask licensed and Congressman Carbajal spoke to the panel and we also had six
community organizations and experts, one expert that was
brought in from Germany that offered his perspective.
So we had a lot of activity, a lot of conversation and
discussion.

Again, I just want to recognize the spent fuel
subcommittee and Linda's role in leading that, and
before we get into any discussion, Linda, do you have
any comments? You can first kick us off.

MS. SEELEY: Okay. Thank you. I want to thank
PG&E for -- for that week, those two day-long meetings,
and, Chuck, you for being an excellent facilitator. I
learned a lot at those meetings. I do -- I hope people
will watch online. I know it's kind of technical, a lot
of the things in there, but, you know, this is our
future that we're talking about and so I think it's
really -- if people can just, you know, even listen to
it, it's an important thing for the public to know.

I wanted to say that GNS, the vendor who
makes -- that makes the cask door -- cask, that they met
with the Nuclear Regulatory Commission on February 21st
and they're applying for -- I think it's called a
Certificate of Compliance to have their cask used in the
U.S. now. I personally was very impressed with that
storage system because it's, according to our expert
from Germany, Klaus Janberg, who came here, he said
they've been using that cask in Germany since 1983. It hasn't changed and the reason that it's good is because it's die cast, which means that they take this molten iron and pour it into a mold and there aren't any seams in it and so it is much less likely -- I mean, it rusts on the outside and stuff, but the oxidation and the rust on the outside actually provides a protective cover for it and it has a double-lidded system so that you can go in there and look around, it is pressure-monitored. It has a lot of attributes that I think the others don't have. I don't want to be too prejudice, but I was super-impressed because it's been used since 1983 and they've never had a problem with one of them and that's longer than we've been using them.

So, anyway, and that's all I want to say, but -- no. Thank you very much for making this happen for us. I think it's allowing our community to go into a process that is different from anything that's happened in the whole country where it's been, like, out in the air, out in the open, we're asking questions, people are getting -- we're getting answers, your -- PG&E, you've taken us to so many different places to see how they do it and it's extremely been really, really informative to us. So I am -- I thank you very much.

MR. JONES: Thank you.
MR. ANDERS: Thank you, Linda. Any other comments, questions? Kara.

MS. WOODRUFF: I think the questions that we're looking at are profound. It's -- it's hard to imagine that we're making decisions that could affect how something is stored for tens of thousands of years because it poses risks to many, many future generations, but I think the task is a little bit easier when I break down what it is that we are trying to provide or shed some light on and here's a short list and it summarizes what all of you have said.

When you consider when and how to move the spent fuel from the pools to the dry casks, we need to understand what type of cask is best in this situation and what kind of facility those casks may or may not be placed into. We need to think about inspection, should the NRC be inspecting this, for how long shall they remain on site well after decommissioning, what does the aging management plan look like, how do we monitor corrosion and other issues, how do we feel about interim consolidated storage proposals that are being made to possibly move casks locally from California to Texas or New Mexico, how do we feel about a permanent storage facility.

We recently learned that although Yucca
Mountain is off the table, it appears that there is new possible federal funding to put it back on the table with this administration. How do we feel about that? And, finally, how do we feel about the potential sale of Diablo Canyon from PG&E? We've been told it's not possible, there's no plans on the table, but maybe we also want to take a stand on that, as well.

So I don't -- it's very difficult for all of us to make these decisions. None of us are nuclear scientists. We'll rely on a lot of expertise, but I think if we break it down, we can perhaps provide some recommendations in areas where we're suited to do so and I look forward to that. Thank you.

MR. ANDERS: Thank you, Kara. Alex and then Lauren.

MR. KARLIN: Yeah. Thank you. My thoughts are similar to what I've mentioned at other panel meetings is to try to put this into some context, I think, to back off and put it into a broader context, the concept, the issue tonight, spent nuclear fuel, how to handle it in the pools, in the casks, in centralized interim storage, in temporary storage on site, and the context is that this -- these issues, environmental safety, have been debated for 40 years by, literally, a thousand experts have spent much of their career on these issues.
Billions of dollars have been spent. Yucca Mountain, the federal government, the Department of Energy and all sorts of people spent 15 billion dollars and Yucca Mountain is designed to handle spent nuclear fuel.

So we have scratched a very tiny scratch on the surface of this issue and Linda Seeley had heard about spent nuclear fuel many years, David Baldwin, he worked there, he knows spent nuclear fuel, I've had the opportunity to work, but this panel is grappling with an issue -- with issues that are been plaguing the industry and the country for years, and other countries, as well.

I think one thing I come away with is the universal advice Dr. Budnitz -- that get it out of the pool as soon as possible, up on that ISFSI -- let me see if I've got his words right. It's a whole lot more safe -- safer and stronger against terrorist attack if it's in that ISFSI and out of the pool, much more secure, much more safe. That's one basic proposition that I think everyone in the room would agree with and Dr. Budnitz, I think, expressed it that way. It's universal.

Now we're confronted with fancy diagrams that show a cask and a circle and a red cross and blue and purple and we are told by PG&E, well, we have to keep it in the pool longer, this provides more options and, oh,
it will get it all out of the pool sooner and this is a better risk analysis and we asked Dr. Budnitz a little bit about that and he said, well, you know, there's pros and cons, we'll look at it, and even Dr. Budnitz, who is an expert in nuclear safety, said the Diablo Canyon Independent Safety Committee, if it was going to deal with spent nuclear fuel and continue after 2025, would probably need different members who are spent nuclear fuel experts and I think that's probably right. We don't have any spent nuclear fuel experts on this panel. In fact, we don't even have any hired. The Diablo Canyon Independent Safety Committee hires separate experts that they need. We don't have that ability. We have utterly no -- this panel has utterly no basis, competence to evaluate whether what PG&E is telling us is right or wrong. All we can either trust them or we can distrust them, but we really don't have the competence to analyze that. So I just think there's a problem here.

I do know that in the Public Utilities Commission, this issue is being litigated. Alliance for Nuclear has raised the issue of the failure of the company to -- alleged failure to get an offloading campaign that's expedited and so that will be litigated and I think we should all watch that and maybe we can
learn something, but this panel, we can opine and feel as we want, but whether Yucca gets permitted, whether centralized interim storage gets permitted, whether hardened on-site storage is imposed, we can say whatever we want. It's going to make that much difference as to what NRC does in terms of regulating that or not and they are the ones that make that decision.

MR. ANDERS: Thank you, Alex. Lauren and then Kara.

MR. BROWN: I think you mentioned that you're anticipating sending out the request for proposal to three companies; is that right? And which are they?

MR. JONES: I'll have Mark come up and address that, but I think that's the shorthand for the three that have active licenses, but I know one would be Holtec, one would be ORANO, and, Mark, you want to come up here and close that out?

MR. MAYER: So the third supplier that we would be looking at would be the MAGNASTOR from NAC International, N-A-C.

MR. BROWN: And if GNS succeeds in getting qualification by the NRC, will you also include them in your --

MR. KARLIN: 50 years.

MR. MAYER: So like Alex just said, it would
take them a long time for them to get their C of C --
their Certificate of Compliance through the system. So
it's unlikely.

MR. KARLIN: You're putting that on RFP now, this year? There's no way you've got an RFP for people who can actually --

MR. JONES: Mr. Karlin, you're microphone.

MR. KARLIN: As you're saying, an RFP goes out to people who have licenses to provide you the product you require now and GNS doesn't have that and it will take several years at least for them to get it. They haven't even applied. They just had a preliminary meeting. So I think it is correct. Maybe the next time, maybe three years from now, maybe ten years from now, but until GNS gets a COC, Certificate of Compliance, you can't even ask an RFP for them. Right?

MR. MAYER: Okay. I think that's correct.

MR. ANDERS: Okay. Next comment from Scott.

MR. LATHROP: I'm just kind of sitting here listening to everybody and I would like to try to bring everybody back -- I want to say focus back as far as I think what the panel is all about. You know, we're supposed to be here getting the public input and we've heard a lot of technical information over the last three times that we have met and I believe probably we have
received enough information to be able to put something forward as far as what I think the local community would like to see. There's been a lot of comments come up as far as a shorter time in the pool, get it -- you know, get it into dry storage as fast as possible. I think we had a lot of discussion here that is really above us, meaning that once you lay out certain technical requirements for new casks for certain applications, I have a lot of confidence in what I've heard so far over a period of time that there's a strong expertise out there to be able to try to meet that goal. I think our position here is more to set what we would like to see as a community. There's people on the panel here that maybe doesn't have a problem with having stuff in the pool for 20 years, others may say, you know, get it out as fast as you can. We can argue all day long about, you know, who is saying what. I think our goal is to set that overall parameter to give feedback to PG&E this is what we'd like to see happen.

So, you know, I sit here and I listen to all this and it's not going to be solved here, it's going to be solved with the experts and we all -- I also would like to focus people in on the whole idea of risk assessment. I think we have a whole range in the panel right here. Some are not very risk-tolerant. They want
guarantees that it's never -- never going to be a
problem, there's others on the panel that maybe
understand a risk and may be willing to take more risk,
maybe tie it closer to the economics and all. We're not
going to be the ones solving those problems. We can
only kind of set out kind of like a vision of how we
would like to see something go forward, and whatever
that recommendation is, it's going to have a certain
requirement as far as what PG&E purchases in the way of
a cask, it's going to take a certain amount of time,
it's going to cost a certain amount of money and someone
else is going to make that decision if that's
appropriate or not, but I think our goal is primarily to
set that. We're not going to -- I'm sorry to say, you
know, we can make a recommendation to buy this cask,
that's not going to happen, but we would say that we
would like to have a cask that will be able to meet the
timeline. And what company is that going to be? I
don't know. It has to meet all the requirements and be
approved by everyone.

So I don't know. I would just like to focus
the panel back to, I think, what our mission or our goal
is and try to -- and don't get into the weeds so much.
I think a lot of experts -- even tonight, I learned a
lot tonight. I appreciate the presentations and, I
don't know, I think that's where we need to focus.

MR. ANDERS: Thank you, Nancy.

MS. O'MALLEY: Well, as I have been speaking with people in the public, I want to point out that I have spoken to a fair number of people that actually aren't even aware that the spent fuel will be stored out at Diablo Canyon. So I think it's really good that we're having these discussions now and that the public becomes aware that there will be what's called an ISFSI. That's hard to say, but that's where the older spent fuel will be stored, and, also, I want to just emphasize that from what I've learned is that there's a world of difference between fuel in the spent fuel pools versus being in the ISFSI and that once it gets out to the ISFSI, it's older fuel, it's at least minimum of two to three years old and my understanding is that there is no longer a risk for a zirconium fire, one of those uncontrollable fires, in which case the radioactive material would be aerosolized and there would be a plume and it would affect the whole county. That is no longer the case once it gets out to the ISFSI.

And I guess I would like maybe Dr. Budnitz and PG&E to just clarify that that's the case because during our workshop, we did have someone say on the record that a zirconium fire was possible at an ISFSI, and, also, I
want to make sure that, you know, as we talk about getting new casks that can tolerate higher burn-up fuels, you know, is that still the case that a zirconium fire won't be possible in the ISFSI.

MR. ANDERS: Thank you. I just want to take the opportunity to remind the panel of the mission statement for this group, for the panel, and that is to inform the public about the issues and decisions that are being made about the process, the timing, the opportunities and the challenges and, also, provide a mechanism for input for the public to PG&E and -- to and through PG&E to the CPUC.

So I just want to bring us back to our mission as we're having this discussion because as I'm looking up here, I'm seeing a video that's being broadcast and that's available for recording all of our workshops, all of our meetings, all of the presentations are available to the public for their information and education and we have multiple pathways for public input, evidenced by the fact that we have almost a thousand public comments to date. So Frank, Alex.

MR. MECHAM: Just a couple of comments, if I could. First of all, I want to thank Lauren. You sent us some papers that were pretty technical. I read through all of that and had to use my dictionary, but
the last one you sent explained an awful lot more in a
more simplistic basis.

My point is that the information that we've
received and all of the information that we have read, I
don't know that the public would -- one, would want to
do that and, two, would understand a lot of it either
because some of us don't. So I think Scott's right.
Our role is not to become a nuclear scientist; although,
I think maybe we've learned enough that we could apply,
but I think that our goal is to try to hear and, as you
mentioned, our goal is to talk to the public. Well,
that's very difficult to do, to try to talk about some
of this technical information that's out there. I've
learned a tremendous amount. Doctor that spoke tonight,
he did a lot more education tonight than I ever had on
the nuclear industry in itself.

So we've learned a lot, but I think, again, we
need to go back, like Scott says, back to what is our
purpose and our purpose is basically we don't make a
decision, we make a recommendation and that's all.

MR. ANDERS: Alex.

MR. KARLIN: I think that's the right approach,
what Scott has said, and Frank and Linda. Our mission
statement, the charter that we have, says we are to
serve as a conduit for public input and for PG&E's
output and exchange a conduit and so we're going to
leave this meeting and now we think what do we do with
everything we've heard. We want to write something up
and probably submit it to the PUC, hopefully.

There are two qualitatively different things we
can do. One is we can simply do our best to accurately
reflect the input that we have received from the public
on these issues. 23 percent of the people believe this
and 75 -- 2 percent believe that and 5 percent have said
such and such and that would be a good thing to do.
That's worthwhile right there to say we have gathered
public input and this is what the public seems to have
said to us and we'll convey that to the proper
authorities and I think that may be sufficient, quite
frankly.

The next step is we can say, and in addition to
what public input we've received, we have decided to
make some recommendations on these extraordinarily
difficult and highly technical issues that have been
litigated and contested for 40 years. We think Yucca
Mountain should not be built, we think consolidated
interim storage should not be pursued, we think a new
cask should -- I'm not sure -- I feel -- you know, we're
going to talk about that, but I think as we talk about
that in our -- I'm not sure -- I guess I'm conveying
that I feel very hesitant to think that we can productively and legitimately make -- we can make all the recommendations we want independently, public said this, but in addition to that, we want to recommend X, Y and Z. I have some concern that we have any -- that's something we should be doing at this point.

MR. ANDERS: Thank you. Any other comments?

Linda and then Nancy.

MS. SEELEY: Very quickly. I think we can -- I apologize for mentioning a cask vendor's name. I shouldn't have done that, but I think, Alex, that, and panel, I think we can make recommendations. I mean, we spent, you know, those two whole days listening to people and taking public input and all that stuff. I think we could make recommendations about the attributes that we would like to see in a dry cask, you know, that generally -- like we want to be safe and we want to be able to inspect it, we want to be able to monitor the radiation, we want it to be -- you know, I can't think of any right now, but I think that we have that capacity to do that, along with the other things, like what has the public said they want.

So I don't -- I think it would be a waste of time for us to have spent all this time and energy and thought in reading and pursuing all of this stuff that
we've done if we just go, well, we don't know, let's leave it up to the experts. We know what we want.

We're people.

MR. ANDERS: Thank you, Nancy.

MS. O'MALLEY: Tying in with what Linda's saying, I mean, I've been keeping my cask wish list here for PG&E to hear. So one of them would be safety, but safety trumps cost and I guess that would be number one, but then, also, there are newer more corrosion-resistant steel that can be used in the canisters. Also, they have new canisters that are able to withstand -- to handle increased heat load, they have improved welding in some of the newer canisters. I'm sure there are improvements in seismic safety. Also, there are new designs that are designed for inspectability and there are new technologies now, robots in some sort of a ring that they can use with certain casks. So those are all things -- and, also, you know, a cask vendor that, hopefully, you can get through the license procedure in a timely manner.

So those are all just some examples of general suggestions that we can make. I don't think we can really recommend a specific cask vendor. I think it sounds like cask or casks system that we heard about at our workshops, you know, you're not really able to get a
license and it can't really -- and there are also issues there with production. I mean, he sounds -- it sounds like there's a several-year lag in even producing those casks. So I don't think that's really going to be a viable option, unfortunately, but -- so aside from that, I think we can make a number of generalized recommendations.

MR. ANDERS: Any further comments before we proceed? Lauren.

MR. BROWN: Just following up on that theme, I think looking at our role in representing this community, we have to be aware that the bottom line is that our community wants to feel safe. That is the single biggest issue with nuclear energy. It's been that way ever since the idea of putting a nuclear power plant in this area started to be talked about.

So we have a responsibility to learn enough that we feel comfortable that the level of risk is reasonable and acceptable, and if we can get ourselves to that point, then we can legitimately represent to the community, you know, we think that everything that could be done to enhance the safety is being done, we're okay with it, and I think if we handle our process of collecting enough information to persuade ourselves of that feeling, armed with facts that we get from experts,
armed with information that PG&E shares with us, we can legiti-
mately go to the community and say, you know, here's -- here's the process, we feel confident.

Part of how we get there is for the community to communicate with us so that we know what their issues are because we got to take that into account. So I really encourage the public to constantly think about bringing their issues to us because we are here representing the community.

MR. ANDERS: Thank you, Lauren. That's a good segue to, again, encourage the community to provide their comments now because the panel is going to continue this dialogue and will develop some vision statement, recommendations and goals similar to what they've done for the other topics that you've discussed.

So thank you all very much for your time and attention. I want to talk about our next topic, which is going -- the next public meeting is going to take place on June 12th and the topic of that meeting is the panel's structure and the past -- the panel's performance. These are opportunities for the panel to serve the community in a more effective way, to create a dialogue about that topic, to assess how the panel's performance has been in their first year of existence and looking for opportunities to improve that
performance, things that might be done that will make it more effective for the community and for PG&E. So I'm looking forward to that dialogue over the next few months, culminating, again, in a public meeting on June 12th.

Consistent with continuous improvement, one of the things that this panel has done is to take a look at this meeting and identify the things that they like about this meeting and things that we might be able to improve in future meetings. Any comments? Any of the panel members have any thoughts or comments of opportunities for tweaking the meeting, the process?

Did you hear that? Dr. Budnitz said move the podium over here so the speaker can hear the --

MR. KARLIN: Move the podium over here so Dr. Budnitz can see. The Diable Canyon Independent Safety Committee has a podium situated in the same way, that the people in the audience can't see that question. So what's good for the goose is good for the gander, Doctor.

MR. ANDERS: I want to share with the audience. This is really an awkward situation because you're here. It's not like anybody's ignoring you and the speakers can't see you and the speakers want to communicate with you, I know I do, and the problem is, the reality is the

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cameras are there, and the folks doing the video, it doesn't work if we turn or we wander away from the podium. So we're complying -- we're trying to accomplish two things and that is to make sure we have a good record of the meeting so that the cameras are seeing the speakers all the time and it's in no way any intention to ignore the public. So appreciate your understanding. Okay. Before we adjourn, Lauren.

MR. BROWN: I'd just like to say that I think this meeting was greatly enhanced by having Dr. Budnitz here to give an overview of the spent fuel issue. We really appreciate it. I think you helped make this a much more successful meeting. Thank you.

MR. ANDERS: Thank you. Jim, you had a couple of closing comments?

MR. WELSCH: Well, being new to the panel, first of all, I don't know that we have any of our government center team here, but what an incredible opportunity to use this facility and our Board of Supervisors making this available. Although, it may have a few shortcomings, it is really such a nice facility and it makes it so easy to facilitate these conversations. So my compliments to our Board of Supervisors and our county government team.

I'll pass on to Jon this committee's -- I know,
Alex, you expressed earlier the gratitude to Jon Franke. I'll pass that on personally. I'll do that, and I also want to thank the panel. This is very informative. I understand some of the restrictions some of you may feel. The buck stops here. Okay? I signed the letter under oath and affirmation. You know, I'm the one that has to put my integrity on the line as we make decisions and move forward and communicate with the regulator. Our high responsibility, to put safety first.

You know, I was a -- I was a licensed operator on crew. I know what it's like to have the responsibility and this informed me tonight. I have a much better sense for what the issues are and where your questions are and what your concerns are and I look forward to getting to -- I look forward to hearing from this panel on collectively what your thoughts are and making recommendations and I'll just say it moves me and it will influence, but in the end, I've got to -- you know, the PG&E team, we need to make these decisions. We are very sincerely interested in understanding what our community thinks about these very important decisions and this panel is the conduit that we've set up to help make sure we get that input.

So thank you very much. The beauty of America, dialogue and diverse opinion, that's what makes the
process robust and I appreciate it. So thank you,

Chuck.

MR. ANDERS: Thank you, Jim. Thanks to all for

your participation and attention. Everyone travel

safely and we are adjourned.

(The proceedings adjourned at 9:49 p.m.)
REPORTER'S CERTIFICATE

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I, MELISSA PLOOY, Certified Shorthand Reporter, court reporter pro tem for the State of California, County of San Luis Obispo, holding Certified Shorthand Reporter License No. 13068, do hereby certify:

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