

1 UNITED STATES OF AMERICA
2 NUCLEAR REGULATORY COMMISSION

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5 REACTOR DECOMMISSIONING PUBLIC MEETING
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11 U.S. Nuclear Regulatory Commission
12 11545 Rockville Pike
13 Room T-2B3
14 White Flint Building 2
15 Rockville, Maryland
16 Monday, June 7, 1999
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18 The above-entitled meeting commenced, pursuant to notice, at
19 9:02 a.m.
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P R O C E E D I N G S

[9:02 a.m.]

MR. DUDLEY: Good morning. I am Richard Dudley, and I am a Senior Project Manager in the Reactor Decommissioning Section of the Office of Nuclear Reactor Regulation. On behalf of the NRC I would like to welcome everyone to this public meeting on reactor decommissioning.

On March 17, 1999 the NRC Commissioners met with the NRC Staff and with industry representatives from the Nuclear Energy Institute. We discussed a new approach to establishing rules for power reactors in the decommissioning process. At the meeting it was decided that the NRC would perform a special review of certain decommissioning issues to develop a risk-informed approach to issuing new regulations in these areas.

Since the March Commission meeting, the NRC Staff has had two additional public meetings to discuss this effort and to solicit input from stakeholders. The purpose of today's meeting is for the NRC to discuss the status and preliminary results of its decommissioning risk assessment.

This slide shows today's agenda. Extra copies of the agenda are available there at the table right in the middle there. In addition, copies of the slides that we will be using are also available at that table.

First, Stu Richards of NRC will give an overview of the status of the risk assessment. Next Vonna Ordaz, Diane Jackson and Glenn Kelly will summarize the preliminary results.

The NRC's presentation should be over by about 10:45, and then we will have a 30-minute period for questions and answers.

Next, Bill Huffman of the NRC will discuss ongoing efforts to improve and clarify the existing decommissioning regulations. A 15-minute period for questions will follow Bill's talk, then we will

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1 break for lunch until about 1:00 p.m.

2 After lunch, representatives from the Nuclear Energy
3 Institute will speak for about an hour followed by a 30-minute period
4 for questions, then stakeholders from the general public will be given
5 an opportunity to speak.

6 We have a sign-up list for public speakers on the clipboard
7 over on the table to my right, so all members of the public that wish to
8 speak, if you would, please, sign on that clipboard. That way we make
9 sure we allot time for everyone who wishes to speak, and when we know
10 how many people, we will divide the time we have into segments and make
11 sure everyone gets an ample opportunity to be heard. So if you want to
12 speak, again please be sure that you have signed up on the clipboard to
13 my right.

14 We are recording today's conversation so a transcript can be
15 made of the discussions. Because of the transcript I will ask all
16 speakers or people making comments or asking questions to first identify
17 themselves before they speak so that the transcript will be accurate.
18 If you forget, I will try to remind you.

19 Attendance sheets -- if you didn't sign an attendance sheet
20 when you came in, we are circulating some clipboards so I would like
21 everyone to make sure that they have signed the attendance sheet,
22 everyone who is here. Thank you.

23 This is primarily a technical meeting. Therefore, before we
24 get started with the technical part of the meeting, I would like to go
25 around the room and have everyone to please introduce themselves and
state their affiliation so we have a better understanding of who is
present.

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Again, I am Richard Dudley. I am a Project Manager in the
Decommissioning Section in the Office of Nuclear Reactor Regulation.

MR. RICHARDS: I am Stu Richards. I am a Project Director

1 in DLPM and NRR.

2 MR. BARRETT: I am Richard Barrett. I am Chief of the Risk
3 Branch in NRR.

4 MS. ORDAZ: I am Vonna Ordaz in the Plant Systems Branch in
5 NRR.

6 MS. JACKSON: I am Diane Jackson. I am a Reviewer in the
7 Plant Systems Branch and a member of the Technical Working Group.

8 MR. KELLY: I am Glenn Kelly. I am a Senior Reliability
9 Risk Analyst with the Risk Group in NRR.

10 MR. HUBBARD: George Hubbard, Section Chief, Plant Systems
11 Branch, NRR.

12 MR. SHADIS: My name is Ray Shadis, a public participant
13 from the state of Maine.

14 MR. MEISNER: Mike Meisner, Maine Yankee.

15 MS. HENDRICKS: Lynnette Hendricks, NEI.

16 MR. BRADLEY: Biff Bradley, NEI.

17 MR. RAY: Phillip Ray, Project Manager in Decommissioning
18 Section.

19 MR. DUDLEY: They doesn't need to be in the transcript.
20 There will be a written list.

21 MR. HUSTON: Roger Houston, Licensing Support Services.

22 MS. WYCHE: Altheia Wyche, SERCH Licensing/ Bechtel

23
24 MR. LOCHBAUM: David Lochbaum, Union of Concerned
25 Scientists.

MR. DUDLEY: Mort?

MR. FAIRTILE: Mort Fairtile, MRR/DLPM.

MR. ARILDSEN: Jesse Arildsen, Senior Operations Engineer,
& NRC/NRR/DIPM.

MR. KENNER: Paul Kenner, Decommissioning Section, NRR.

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1 MR. WHEELER: Duke Wheeler, Decommissioning Section, NRR.

2 MR. SATORIUS: Mark Sartorius, Office of EDO, NRC.

3 MR. STODENMEIER: Joe Stockmeyer, Reactor Systems Branch,
4 NRC.

5 MR. HANNON: John Hannon, Plant Systems Branch Chief, NRR.

6 MR. DAM: Scott Dam, DNFL.

7 MR. RUBIN: Mark Rubin, PRE Branch Head --

8 MR. HULLIHAN: Terry Hullihan, Director, Division of --
9 Safety --

10 MR. MARKLEY: Tony Markley, Rulemaking Branch, NRR.

11 MR. HUFFMAN: Bill Huffman, Decommissioning Section, NRR.

12 MR. BAGCHI: Goutam Bagchi, also just walked in.

13 MR. ROTHMAN: Bob Rothman also.

14 MR. DUDLEY: And Bob Rothman, thank you. They are of our
15 Geosciences Group.

16 Now I would like to introduce Stu Richards, Director of
17 Project Directorate 4 in the Decommissioning Project Directorate, who
18 will have the opening remarks.

19 MR. RICHARDS: All right. Thank you, everyone, for coming
20 today. I would like emphasize again that this is intended to be a
21 working meeting. We picked this room today because we didn't know how
22 many people would be here. It seems inevitably when you pick a smaller
23 room for a working meeting you end up with 50 people and then you have
24 to relocate, and so we decided to go bigger to be safer in anticipation
25 of maybe more people than some of the smaller rooms could handle, so
this is intended to be a working meeting with a discussion, and I know
the microphones and all that kind of lend some formality to it, but that
is not intended.

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If we can have the first slide -- a little background. In
the past as plants enter decommissioning, licensees typically come in

1 and look for exemptions from our regulations, recognizing that a plant
2 is no longer in operating mode. However, when they shut down their
3 license of course is still an operating license so licensees seek
4 exemptions from our requirements in order to reduce unnecessary costs at
5 decommissioned plants.

6 We have been treating those exemptions requests on a case by
7 case basis and we feel that is not the most efficient or effective way
8 to do business. I think the industry agrees and we are looking for a
9 better way to draw on the experience that the agency and the industry
10 has gained in the decommissioning area and see if we can improve the way
11 we do business, so hence we are engaged now in a process to try and
12 streamline decommissioning rulemaking and the decommissioning process
13 once a plant enters decommissioning.

14 In the past there have been some rulemakings underway and in
15 particular security, financial protection, and EP. We are trying to
16 look at those areas and see if we can bring it together into one
17 integrated effort to go forward in the future. Next slide, please.

18 We met with the Commission back in March -- March 17th --
19 and at that time the Staff proposed to basically take a hiatus on the
20 rulemakings that were in progress, to take a step back and try and look
21 down the road a ways, see where we want to go, and come back to the
22 Commission and make them a proposal for a new integrated risk-informed
23 approach.

24 We told the Commission at the time that we intended to make
25 it a public process where we would involve our stakeholders and members
of the industry. We are attempting to do that and we have had a number
of public meetings and this is a continuation of that series of
meetings.

We hope that the approach we are taking results in an
approach that is both safe but also is effective and efficient. We hope

1 not to have to deal with decommissioning issues on plant by plant basis,
2 but rather have it all codified in the end, so that everybody knows what
3 our requirements are, what is expected, and the utilities can move
4 promptly through the process and the public will know what our
5 requirements are and what the basis for it is. Next slide, please.

6 We formed two working groups as part of this effort. One is
7 a working group that is my responsibility and that working group's
8 effort is to take a look at the rules associated with decommissioning,
9 primarily looking at the process -- how do we deal with the
10 decommissioning plants and is there a better way to approach this. That
11 working group is led by Bill Huffman, over here to my left and he is on
12 the agenda to talk later in the morning.

13 The second working group is under the responsibility of Gary
14 Holahan. Gary is also here today.

15 The technical working groups' job was to take a look at the
16 risk associated with decommissioning, primarily with the storage of
17 spent fuel, and bring back to the Projects organization a technical
18 basis to go forward with our rulemaking actions, so they play a key role
19 in what we are doing here today and of course we have talked about their
20 efforts in the last couple of public meetings we have had.

21 I think at the last public meeting we had, Gary Holahan
22 discussed the scenarios that were being looked at the technical working
23 group and today we are going to talk a little bit about the preliminary,
24 the very early preliminary results of the technical working group's look
25 at those scenarios.

Now our intention is to provide a status to the Commission
by June the 18th of where we are at on both fronts, the process side
under Bill Huffman and additional the technical working group side under
Gary Holahan. I want to emphasize today that the results of the
technical working group are very preliminary at this point. We are not

1 ready to take any regulatory action on what the group has done. They
2 have only had 60 days I guess to be working on this. They have been
3 working extremely hard, but on the other hand, what we are talking about
4 today has not had the benefit of reviews internal to the agency, the
5 kind of peer reviews that we would expect their kind of work to have.

6 Additionally, we want to take this information and share it
7 with our stakeholders, with the public, and with the industry and
8 receive their feedback. I would be the first to acknowledge that I
9 think the Staff probably doesn't have a lot of experience with the
10 operation of a decommissioned plant, so we went into this with a lot of
11 knowledge about operating reactors but I think we are still learning in
12 the decommissioning area and hence the importance of getting some
13 feedback from the industry on some of the assumptions made in our study
14 and likewise going out to the public and other interested parties and
15 seeing what they have to say about it.

16 So again, this is very preliminary results. This is just
17 one more step in our public process of trying to share what we are doing
18 with our stakeholders as we move on down the road. Next slide, please.

19 At the risk of repeating myself, again the goal here is to
20 make some decisions on changing the regulatory process to make it more
21 efficient and effective, yet maintain the appropriate level of safety.
22 In order to do that, we need a technical basis to go down the road, so
23 whatever we are going to do, we want to make sure that we are well
24 informed basically on the science side before we move forward. Next
25 slide, please.

We will get into more detail as we get into the
presentation. As it stands right now, our intention is to get the
technical working groups to draft a preliminary report out for comment,
make it publicly available by August.

We are also going to go out to -- well, I should let them

1 speak to it. This is kind of a work in progress, but we will probably
2 be looking to a national lab for a peer group kind of a review, so we
3 are looking for that.

4 We hope to get all the comments back and get our review of
5 those comments by the end of the year and have the technical working
6 group complete their assessment by March of the year 2000.

7 Okay. With that I think it is Vonna Ordaz's turn.

8 MS. ORDAZ: Thank you, Stu. I would like to give you an
9 overview of what we have done. Up to this point the staff has reviewed
10 the licensee's emergency preparedness exemption request on a
11 plant-specific basis using criteria where air cooling of the fuel is
12 adequate, or sufficient time is available to protective measures using
13 local emergency response.

14 The technical working group has performed deterministic and
15 probabilistic and assessments. Our preliminary results are based on
16 site visits and current information on spent fuel pool configuration.
17 As Stu alluded to, it is important to note that our preliminary results
18 are provided for information and discussion purposes only and they can
19 not be applied to the regulatory process at this time.

20 Now, Diane Jackson will discuss the preliminary
21 deterministic results.

22 MS. JACKSON: Good morning. Our deterministic calculations
23 analyze the heatup of the fuel and the clad to determine the potential
24 for zirconium oxidation and ignition. The most extensive work to date
25 we have found has been in support of Generic Safety Issue 82 to severe
accidents for spent fuel pools, which was performed in the 1980s and was
based on operating reactors.

Our starting point then was to look at this information to
see if it was applicable to decommissioned plants. The studies we found
provided good insights on zirconium oxidation. The studies identified

1 the initiation of a zirconium fire in a spent fuel pool was highly
2 dependent on decayed power and fuel storage configuration.

3 In our assessment we found that the operating practices
4 since the '80s may affect the spent fuel heatup analysis results. In
5 particular, there has been an increase in fuel burnup which results in
6 higher decay power, and also denser fuel storage racking, which reduces
7 your heat removal for air cooling. Next slide, please.

8 Our preliminary results indicate that on a generic basis the
9 decay time required to allow air cooling only may be longer than the
10 generic studies performed for operating reactor reactors. However, we
11 find that previous plant-specific analyses which were done on the actual
12 configuration for the spent fuel pools for decommissioned plants are
13 unaffected by this.

14 The staff performed two types of analyses to identify
15 potential review criteria. The first, the potential criterion, was for
16 reviewing exemptions, is that a zirconium fire could not occur and that
17 air cooling would be adequate. Our preliminary estimates using generic
18 near-bounding thermal-hydraulic spent fuel heatup assumptions indicate
19 that three to five years of decay time may be needed to reach a point
20 where air cooling of the fuel is adequate. And, again, if the plant
21 wanted to perform site-specific calculations on their fuel with their
22 fuel configuration, this may yield shorter time estimates than the
23 generic analyses.

24 We also found that for plant-specific analyses, that a
25 maximum allowable temperature of 300 degrees C may be acceptable if
certain analyses conditions were met.

MR. RICHARDS: Is that three or 800?

MS. JACKSON: Oh, I am sorry, 800. Another potential
criterion for reviewing exemptions is the determination that sufficient
time would be available to take protective measures using local

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1 emergency response after the fuel is uncovered. We performed generic
2 bounding calculations correlating decay time of the fuel since final
3 shutdown to the heatup time of the fuel after it is uncovered. The
4 calculations were conservative, they were based on adiabatic conditions,
5 which assumes no heat loss, using one fuel rod heating up from 30
6 degrees C to 900 degrees C.

7 Our preliminary generic results indicate that two years of
8 decay time would be needed for a BWR and two-and-a-half years time would
9 be needed for a PWR to allow approximately 10 hours available to take
10 protective measures using local emergency responses. And, again, more
11 realistic plant-specific calculations could yield shorter decay time
12 estimates.

13 The 10 hours was chosen due to past emergency preparedness
14 exemptions that we have approved, but they were plant-specific
15 exemptions, so at this time it is not certain if 10 hours would be
16 appropriate for every plant in the United States. It is just a gauge
17 right now of how much time could be available to take protective
18 measures.

19 And this concludes our presentation on preliminary
20 deterministic assessment results.

21 Next is Glenn Kelly from the Probabilistic Safety Assessment
22 Branch.

23 MR. MEISNER: Do you want questions and comments as you go
24 along or hold them off?

25 MR. RICHARDS: Why don't we just wait until the end? I mean
why don't we just lay it out on the table and then there is plenty of
time for dialogue. We are not constrained by the clock. We laid out an
agenda here. We have an agenda, but we will have plenty of time to talk
through this.

MR. MEISNER: Okay.

1 MR. KELLY: Good morning, my name is Glenn Kelly, I am with
2 the PRA Branch. We performed a very intense two-month effort to
3 evaluate the frequency of fuel uncovering and the consequences of a
4 zirconium fire at a decommissioned nuclear power plant. The working
5 group performed their preliminary analysis and looked at a large number
6 of initiating events. We did not limit ourselves to just looking at
7 seismic events.

8 A very important part of our analysis that we performed was
9 that we had to consider what kind of equipment was available for
10 providing makeup to the pools, for providing cooling to the pools and
11 support systems to the pools. And, as a matter of fact, one of the
12 things that we are going to be discussing later on with the industry is
13 how and when they go about removing or abandoning equipment at
14 decommissioned plants so that we have a better understanding of how they
15 go about doing that and their basis for it. Next slide, please.

16 I visited four sites where they have decommissioned
17 reactors, and we did our PRA analysis based on that information, plus
18 information I received from the project managers of other decommissioned
19 plants. The configuration that we modeled with our PRA showed a
20 significantly reduced level of redundancy and diversity in the areas of
21 makeup, cooling and support systems. This was, for example, we found
22 that the plants didn't have emergency diesel generators, residual heat
23 removal systems, generally, didn't have large volumetric makeup
24 capability to the spent fuel pool, didn't have uninterruptable power
25 sources.

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An important thing to note, however, is that there are no
plants today that match the conditions we have assumed in our risk
assessment. They are all basically in a better condition today than
what we assumed. This is on the basis of looking at the assumed heat
load that we had, which was one year since the last fuel was transferred

1 from the reactor, and also the combination of equipment being removed
2 from service.

3 The conditions assumed here also do not apply to operating
4 reactors. Operating reactors have the full complement of support
5 systems, makeup systems and cooling systems, things like emergency
6 diesel generators, RHR system, multiple off-site power lines, the normal
7 spent fuel pool cooling systems, full fire protection, makeup sources
8 with large flow rates, frequent operator access and NRC on-site
9 oversight.

10 The frequency of fuel uncovering that we calculated is not
11 equivalent to the frequency of a zirconium fire in spent fuel pools at
12 decommissioned plants. There is some time after you uncover the fuel
13 before the zirconium fire begins. There is potential for recovery in
14 that area, but that period of time, we did not model that recovery. We
15 assumed that once you uncovered the fuel, that you were going to be
16 unable to stop the process at that point. Next slide, please.

17 Our working group's preliminary results indicate that a
18 seismic event is probably not the largest contributor to spent fuel pool
19 uncovering. There are, however, a number of credible initiators that we
20 found. One of the important things to note as we get into this is that
21 there are no one or two dominant scenarios that would be the --
22 potentially could be fixed by a single clever fix, or a couple of clever
23 fixes, that there are enough initiators there that we see that it is not
24 something that we can easily make go away, at least based on our
25 preliminary result.

Based on my site visits, the current plant configurations in
our PRA, we came up with a preliminary estimate of the frequency of
uncovering fuel of about 1 times 10 to the minus 5 per year. Now, the
important thing about this number is that on a generic basis, we found
that we could not preclude -- again, this is our preliminary look at

1 this -- we could not preclude concerns about spent fuel pool uncovering on
2 a generic basis. Similarly, our preliminary calculations on a zirc
3 alloy fire consequences indicated the off-site doses may be significant,
4 and also could not be generically dismissed. Next slide, please.

5 This slide illuminates for you the types of initiators that
6 we looked at, and we did look at broad range of initiators. Spent fuel
7 pool and the support systems are configured in a manner similar to what
8 I found in my site visits. All of these plants had been shut down for
9 more than two years, that is, it has been more than two years since the
10 last of their fuel was moved from the reactor to the spent fuel pool.
11 These plants had cooling systems that were skid-mounted and I found that
12 they had pretty good instrumentation, the operators were right on top of
13 what was going on.

14 If you look here, the top six events represent about 95
15 percent of the contribution to fuel uncovering. There is no one event
16 that really stands out above all the other events. The cask drop and
17 the seismic event we consider to be the only events that would give you
18 very rapid loss of inventory from the pools.

19 All of these evaluations are driven by assumptions. We have
20 about three pages of assumptions in our detailed report that we are
21 working on now, and that will probably be available for review and
22 comment in early August. Next slide, please.

23 This is another way of taking a look at the contribution of
24 the various contributors. And, again, it gives you an idea that there
25 is no one contributor that really dominates the event. And that
concludes my summary of the risk aspects of it.

MR. DUDLEY: I guess, next we would go into questions and
answers, but before we do that, I noticed a number of late-comers.
Everyone who has come in late, make sure you please sign either one of
the clipboards at the center post or some other attendance sheet,

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1 clipboard circulating. So please make sure you have signed the
2 attendance.

3 Now Stu Richards will do the summary. Thank you.

4 MR. RICHARDS: I'd like to remind everybody as we go through
5 the discussion again, this is preliminary results for discussion. Like
6 Glenn said, there's some three pages of assumptions you have got to
7 make. Assumptions play a big role in how the results come out, and that
8 is one of the things we are seeking some feedback in is how are these
9 plants really configured out there, now do people do business, so there
10 will be a lot of interesting discussion on that.

11 Again we are trying to look and bring this to a conclusion,
12 at least for the technical working group by March of 2000.

13 That seems like a long ways away and depending on how things
14 go, who knows, maybe we will do better than that, but in order to
15 provide an agenda or a schedule to the Commission that is what we are
16 presently proposing with what we know.

17 Of course our rulemakings that we have put on hiatus at this
18 point are dependent largely on the results of the technical working
19 groups so we are still looking at what we can do with the process under
20 Bill Huffman's working group but until we get the results of the
21 technical working group it somewhat puts a stall on going forward on our
22 rulemakings. Last slide.

23 Finally, once we do get the results from the technical
24 working group then we would go into the rulemaking process and of course
25 rulemaking takes a period of time

Once we have the basis for what we are going to do, we will
try to move smartly forward with that, but the agency's experience has
been that it usually takes a year to two years in order to go through
rulemaking, particularly if it is a rather large rulemaking that we will
be undertaking.

1 The last bullet is what do we do in the meantime. We will
2 be drawing on the experience we are gaining from the technical working
3 group. For instance, they noted that the Staff might be willing to
4 accept 800 degrees C. -- whereas in the past I think it has been 565 --
5 on a case by case basis, but we will be continuing to deal with plants
6 that come in for plant-specific exemptions on a case by case basis, and
7 somewhat continuing down the road as we have before.

8 That completes our presentation and we are certainly hoping
9 for a lot of discussion, so please --

10 MR. MEISNER: Well, I'll start off. Can we put this chart
11 back up on the overhead?

12 MR. DUDLEY: Yes, and Mike, identify yourself, please.

13 MR. MEISNER: Yes. Mike Meisner, Maine Yankee.

14 I guess, Glenn, I am a little surprised by this, because
15 many of these things can't happen in my plant the way you have got them
16 laid out here, and I would like to spend a little time discussing how
17 these events proceed and how you came to the conclusions you did.

18 You mentioned that cask drop and seismic were the only two
19 rapid sources of loss of inventory so I assume the rest progressed
20 fairly slowly. Can you describe the internal fire scenario?

21 MR. KELLY: I think the key with all of the slower events is
22 that we based our initiating event frequencies on information such as we
23 got from AEOD on actual events that had occurred at plants and we had
24 initiators that were on the frequency of 10 to the minus 1 to 10 to the
25 minus 2 per year for various types of problems.

 Now what happens is that most of the concerns that you run
into here with responding or recovering from an accident involve very
low probability events -- we're talking about a 10 to the minus 1 or 10
to the minus 2 initiator, then the rest of this is really human error
rates.

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1 We assumed it's long-term human error rates. This is
2 exactly how we go about performing our PRAs for internal events and
3 external events for operating reactors.

4 We have continued on that same process here in evaluating
5 for decommissioned plants so what we see is although there is a long
6 time available generally for recovery actions that there is a low
7 probability that the recovery actions would not be successful or the
8 operators would make mistakes or would miss things.

9 MR. MEISNER: You say there is a low probability that that
10 would happen?

11 MR. KELLY: That's right. We consider something like one in
12 a thousand or one in 10,000 times to be a low probability recovery
13 event, and that is the reason in part why you get these type of numbers.

14 The other important thing that really drives your numbers
15 here in our analysis and which I do believe is applicable at your site
16 is that the systems are simple but they -- what they lack in their
17 simplicity is levels of redundancy and diversity, which you have at
18 operating plants. There are -- we have various levels that provide us
19 protection there where we have a different series of barriers and that.
20 You don't have the same kind of protection available at a decommissioned
21 plant when you have gone to sled cooling and you have got, for example,
22 most of your power coming off of one bus, which would be very untypical
23 of anything you would find at an operating reactor.

24 So because of that and because there are a lot of single
25 failure points in this typical type of system, one of the things that we
would ordinarily see gives you better recovery results for an operating
reactor is not something that you have available at decommissioned
plants.

 MR. MEISNER: Okay, so would you walk us through the
internal fire.

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1 MR. KELLY: Okay, you want to go through the details of
2 that?

3 MR. MEISNER: Yes.

4 MR. KELLY: I would like to call on Mike Cheok, who can give
5 me the details on exactly those calculations that we have.

6 MR. CHEOK: This is Mike Cheok from the NRR Staff.

7 For the internal fires, what we did was to take the EPRI
8 initiating event frequencies for operating reactors for pumps and
9 electrical cabinets and got an initiating event frequency of 8×10^{-5} . We also included in some cases for the cutting and welding that
10 might be going on in a decommissioned plant if they were going to
11 disassemble equipment from the plants. We took into account manual
12 suppression of the fire, and in this case the manual suppression we
13 chose was at a .05 percent probability. This takes into account the
14 fact that the fire will not be manually suppressed and it also takes
15 into account the fact that since we do not have runs to determine the
16 effect of the fire on equipment in the room, since we do not have
17 geometries of the room, since this is a generic study, we did take into
18 account that in 10 percent of the time a fire will be large enough to
19 break out either offsite power supply or the cooling pumps themselves.

20
21 Given the fact that you have a fire and no suppression, you
22 need to now recover inventory using makeup sources because we assume no
23 recovery of the cooling sources.

24 A recovery in these cases could come from your
25 diesel-powered fire pumps or from any -- what we call the cool reaction,
since you do have a lot of time for the pool to boil down.

MR. MEISNER: Why are we making up the --

MR. CHEOK: I'm sorry?

MR. MEISNER: You are talking about the boil-down time? --

MR. CHEOK: That's correct.

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1 MR. MEISNER: Okay.

2 MR. CHEOK: And like Ken said earlier, this may not be
3 applicable to your plant. What we had done in this case was to assume
4 that the fuel was one year old and at that point we do not have any
5 makeup systems that an operating plant would have already, so when the
6 fuel is one year old we still have the potential for boildown because
7 the fuel is fresh enough.

8 MR. MEISNER: What kind of times did you assume for time to
9 boil?

10 MR. CHEOK: We do have in excess of 120 hours.

11 MR. MEISNER: 120?

12 MR. CHEOK: Correct -- for pool boiling. Given the lack
13 of --

14 MR. RICHARDS: Is that time to boil or time to boil down?

15 MR. CHEOK: That's time to go to boiling and then time to
16 boil down. That includes both times.

17 MR. MEISNER: Thank you.

18 MR. CHEOK: Given the lack of procedures as to what -- we
19 are not quite sure what the operators would do in this instance and I
20 guess that is one reason why we have the public meetings is to find out
21 more information from the operating plants. We are not quite sure what
22 the plant operator would do in this one week, 120 hours, what he would
23 be instructed to do, whether he would try to use the fire pumps -- if
24 they were not available what is the next step, would he go out to the
25 local hardware store and do a makeup pump and from a local reservoir
would he call the local fire department? You are not quite sure what
happens in this case.

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What we had assumed in this analysis is a 5 percent
probability of failure in the next 120 hours of not recovering this
makeup.

1 We have done sensitivity studies. If we had changed this 5
2 percent to 1 percent, this one E minus 5 number that Glenn had mentioned
3 would go down to approximately seven E minus 6 and those numbers will
4 again change depending on what the plant-specific procedures are. If
5 there are specific procedures as to if this does not happen, if you do
6 not recover cooling by the first 24 hours, do this, if this does not
7 happen in the next 10 hours, do this. I mean I think if we have
8 procedures like that, we can quantify our human actions a lot better
9 given a lot of procedures, and we do not know what timeframes the
10 operators would deal with before finally giving up and calling, let's
11 say, the fire department. It is very hard to quantify a human error in
12 this case.

13 MR. MEISNER: Tell me, if you are going to do a PRA for a
14 power facility, operating facility, what kind of assumptions do you make
15 when you have 120 hours of recovery time?

16 MR. CHEOK: The typical HRA methodology that is present
17 today will not work for 120 hour recovery times.

18 MR. MEISNER: What do you assume in those cases?

19 MR. CHEOK: I would not assume anything less than 10 to the
20 minus 4 because I do not think that we can quantify a 10 to the minus 5
21 or 10 to the minus 6 HEP.

22 MR. MEISNER: But in fact, don't you assume that when there
23 is greater than 24 hours, or at least I know in the industry PRAs that
24 is what we do --

25 MR. CHEOK: Right.

 MR. MEISNER: -- if you've got greater than 24 hours to
recover, then you don't take that sequence any further.

 MR. CHEOK: I think in operating plants you have very set
procedures. We can go down EOPs and say if you don't get this at a
certain point, you do this. I do not see those kind of procedures. I

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1 mean there might be procedures like this out there right now. I just do
2 not see them and given the lack of my knowledge of these procedures, I
3 am not sure at what breakpoint an operator would some actions. The
4 operator could wait through the weekend, for example, and say, hey,
5 look, I have a week before this happens, okay? -- and I'll recover
6 cooling, you know, in 24 hours or -- I am not sure.

7 This is why we have this meeting I think. Part of the
8 reason as to why we have this meeting is to find out from the people who
9 know better. They can tell us what their procedures are.

10 MR. MEISNER: Okay. Well, I guess I would make the
11 observation that if you have got 120 hours to recover, you are applying
12 criteria to the shutdown case that you wouldn't apply in an operating
13 situation. I don't know why you are doing that --

14 MR. KELLY: It's not a matter that we wouldn't apply it. We
15 are applying something different here. It's that in an operating case
16 we have other scenarios which contribute and if in an operating case
17 these numbers would not show up as your dominant contributors.

18 When we are performing our operating reactor PRAs, it is not
19 uncommon for people to take 24 hours as their mission time when they are
20 performing the PRA, but that doesn't mean that you shouldn't be looking
21 at events that are longer than that. It's just a way of making it
22 easier for people to perform their calculation.

23 MR. MEISNER: Of course. I guess I would have expected,
24 though, maybe I said it incorrectly, that what you do in that case is
25 identify the need to have some procedural controls and go on.

MR. KELLY: Right, and in this case we didn't have that and
one of our things that we are trying to do here is to provide a
technical basis and a risk-informed basis as to what do we see as the
potential consequences and frequency of uncovering for decommissioned
plants, and if we said, well, we are not going to look at anything that

1 takes longer than the 24 hours then we wouldn't have anything for you
2 because these events all take longer than 24 hours.

3 MR. MEISNER: I think that is the point.

4 MR. KELLY: Right, that's the point.

5 MR. CHEOK: And the other point you have to keep in mind,
6 Mike, here is that we are talking about relatively low numbers. In an
7 operating reactor, you are talking about 10 to the minus 5 numbers. I
8 mean internal fires it jumps up because it is 28 percent, but it is 28
9 percent of 10 to the minus 5.

10 You are talking about something times 10 to the minus 6 as a
11 frequency of uncover, and when you talk about an HEP so close to 10 to
12 the minus 4 we will be saying, hey, look, we are giving the operator
13 9,999 chances of actually mitigating this accident given in 10,000
14 chances, so we are not talking about something that is humongously
15 large.

16 MR. MEISNER: It is still a criterion wouldn't apply to an
17 operating facility.

18 MR. CHEOK: I am not sure, I mean like I said, I wouldn't go
19 below 10 to the minus 4 in an operating facility anyway. I am not
20 comfortable giving a 10 to the minus 5, 10 to the minus 6 HEP to any --

21 MR. MEISNER: I am just saying, applying that factor at all
22 to a scenario, it takes a week to develop.

23 MR. CHEOK: I mean if I am not apply the factor, I am using
24 zero which is smaller than 10 to the minus 4.

25 MR. MEISNER: Which you do for an operating facility?

MR. CHEOK: I am not sure we do it.

MR. MEISNER: How about the loss of coolant inventory?

MR. CHEOK: The loss of coolant inventory is based on some
AEOD data, NUREG-1275, that shows loss of coolant inventory, initiating
event frequency of 10 to the minus 3. Again, in this case we do have

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1 makeup, using the makeup pumps, or we can makeup using the fire pumps.
2 We have alarms, indicator for alarms in the control room. Given failure
3 of the alarms we take credit for operating walk-ins. Given failure of
4 makeup using either the makeup pumps or the fire pumps, we do have
5 enough time again, in excess of 120 hours for makeup through off-site
6 sources, whether you go out and buy a pump from the hardware store or
7 you use the fire brigade. Again, this is a 10 to the minus 6 type
8 frequency.

9 MR. BARRETT: Mike, could you just describe what is the
10 nature of a loss of inventory event? Is this a siphoning type of event
11 or what is it?

12 MR. CHEOK: In the AEOD report in NUREG-1275, they give a
13 lot of different types of initiators. It could be a siphoning type
14 event. It could be a valve type failure or a gate type failure. Most
15 of these errors are operator errors and in the AEOD report most of them
16 are recoverable -- all of them are recoverable.

17 In the AEOD report we have I think about 50 events, I am not
18 going to start quoting them just out of memory. Actually, I didn't
19 bring the report with me.

20 MR. BARRETT: Mike, I didn't need that.

21 MR. CHEOK: In the report basically they have several
22 events, the inventory loss was between one and five feet. There were
23 two incidents where the inventory loss was between five and 10 feet. In
24 a foreign reactor we had an inventory loss of 16 feet.

25 MR. MEISNER: How many of those were decommissioning plants?

MR. CHEOK: I don't -- I am not sure, but I don't believe
any of them were.

MR. MEISNER: Have you looked at their facilities enough to
recognize that things like siphoning can occur, there are opportunities
for operator error?

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1 MS. JACKSON: Siphoning has occurred at a decommissioned
2 plant, it happened at Big Rock. They lost a few inches due to a siphon.
3 So it is something that could happen at a decommissioned plant. We did
4 try and look for information. There is not a whole lot there since
5 plants haven't been decommissioned for very long. So the best data we
6 had available right now was for an operating reactor.

7 MR. MEISNER: Yes. I think -- well, you know, just like
8 someone who made the point earlier that certain things didn't apply to
9 decommissioning plants, previous studies, because they were operating
10 reactors, the reverse applies as well. When you blind flange-off
11 communication pathways, when you put in anti-siphon devices and the
12 like, you preclude these events from occurring. And I will grant you
13 that design will be different from plant-to-plant, but a lot of actions
14 are taken in decommissioning facilities for just that reason, to
15 preclude, not just minimize, but preclude these types of events.

16 MR. KELLY: We found in looking at these things that they
17 are not always precluded. We found that there were times when people
18 put on anti-siphoning devices that weren't adequate, where the break
19 would occur in a line, for someone opening a valve and allowing you to
20 drain it out. We have considered the fact that there is -- we are not
21 looking at siphoning all the way down to the bottom of the pools. We
22 are generally talking about siphoning a certain fraction of the way
23 down, boiling down from there.

24 There have been plants who were configured in the past where
25 you could have siphoned all the way down. We did a study a number of
years ago where we went out and looked at plants, and I think we found
that most everybody would be unable to siphon all the way down today.
We are probably going to want to confirm that, that that is not a
possibility.

There are lines that do communicate, some of them as low and

1 below the fuel level. Some of these have been blind flanged and welded
2 and other ones just have valves in place. So what we did here is, you
3 know, we took a look at the numbers there and we attempted the best we
4 could on a generic basis to see -- this whole idea when we performed
5 this analysis was to see what is a PRA, and that is really just a
6 systematic way of looking at the design, the potential problems you can
7 have with it.

8 What is a PRA going to tell us about the potential problems
9 that we can run into here? And it tells us that when we look at loss of
10 inventory, it is not something that we can automatically dismiss, that
11 maybe we want to look a little bit more closely at the anti-siphoning
12 devices. We want to make sure that we don't have lines that are
13 communicating all the way down, or near to the bottom of the pools.

14 We want to look at maybe some of the things that you might
15 have done where there was a blind flange or something else that was done
16 there, whether that is a problem. Is it something that sticks out and
17 if someone was running there, -- let's say a forklift, if they ran into
18 it, would that cause you problems associated with it? Most cases we
19 expect it probably wouldn't, but it is the type of thing that we would
20 say, let's take a look at it and make sure it is not problem.

21 MR. MEISNER: Yeah, and I understand that, and I think that
22 has to be done, that is a good approach. What I am trying to get to is
23 the idea that you can come up with a different set of numbers here if
24 you make assumptions that certain things like procedures are in place.

25 MR. KELLY: Right. It is exactly right. And that is why we
--

MR. MEISNER: These numbers, as you have laid them out here,
are fairly startling, or could be startling to people.

MR. KELLY: Right. And we were -- the numbers came out
larger than we thought they probably would come out before we started,

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1 and that was one of the insights that we came out with, that it was
2 larger than we had thought about beforehand. But that is, you know, we
3 didn't start out to come out with a load number, we just started out to
4 do the analysis and see what the results were.

5 MR. MEISNER: Well, if you always assume the worst case,
6 though, you are going to come out with a high number.

7 MR. KELLY: Oh, we didn't. Actually, we could make other
8 assumptions that make a factor of 20 or more higher than this, looking
9 at, if you were assuming -- see, right now the plants -- as I say, we
10 modeled this based on what I found out at the plants when I visited
11 them.

12 Now, I also recognize that there were a lot of things that
13 the decommissioned plants were doing that made a lot of sense, but were
14 not necessarily required by regulations. And so we also looked at it to
15 see what would happen if people kind of took a minimalist approach, and
16 then went and stripped away things that aren't required by regulation at
17 this time. And, you know, not being ridiculous, but just looking, you
18 know, what could I do if I just really wanted to kind of go real bare
19 bones, and we saw that that could make a significant difference also.

20 So we are not taking worst cases by far. We were
21 conservative in our deterministic analysis to help determine whether or
22 not there was a problem in the first place. If the fire -- it turned
23 out you can't have a zirc fire anywhere after the first three months,
24 then this whole thing would have gone away, because the only problems
25 that you are really going to have is if you have a zirc alloy, a
zirconium fire. Given that we found that you couldn't dismiss the
possibility of a zirconium fire in the first three to five years, when
we did the risk assessment, well, are the numbers so low that we
shouldn't be concerned? And that did turn out. And we said, well,
about the off-site consequences? And that didn't turn out either. So

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1 that told us that we had to do more, and we had to look at it, and that
2 is partly why we are coming forward today with our preliminary results.

3 As I had mentioned earlier, I have about three pages of
4 assumptions on PRA that we have outlined that will be in the full report
5 that should be out in August. And I wanted to come back to one thing
6 that you said, Mike, that I think is a very important thing to think
7 about. Doing a PRA for a decommissioned plant is not at all the same as
8 doing a PRA for an operating plant. Just as doing a PRA for a plant
9 that is in shutdown is not the same as doing a PRA for an operating
10 plant. We would tend to look at things in a slightly different manner
11 because the PRA itself provides us with a structure on which to perform
12 a systematic assessment.

13 Now, just because when I am in an operating plant, I am
14 performing a systematic assessment in one way, I will still have that
15 same structure when I am doing a PRA at a shutdown plant or at a
16 decommissioned plant, but I am going to be working under different types
17 of assumptions. I am going to have different types of things that are
18 of particular concern to me. And as I said here, you know, you would
19 get no PRA results in a decommissioned plant if you only worried about
20 things that happen in the first 24 hours.

21 So what we have had to do is we have had to really build
22 something that is right at the state of the art. We have gotten expert
23 opinions on some of these human factor error rates. We are not saying
24 that these are the end-all and the perfect numbers. We are certainly
25 interested in exploring that and having other technical experts take a
look at what we have done and give us their comments and suggestions.
But we do think that it is important to recognize that we are talking
about very low human error rates. People have the ability both to do
things very foolishly and also to make very smart and very quick
thinking actions. Does this happen many times in the world today?

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1 So I think what we have done here is we have created a
2 process whereby you can go and you can take a look the decommissioned
3 plant, not the same as you would for an operating reactor, but with the
4 same kind of structure that you use, the same where we have these same
5 event tree, fault tree type process. We do look at operator errors, we
6 look at the amount of time that is available, but we are in a situation
7 where we are out beyond what you ordinary look at in an operating
8 reactor, because this is a whole other arena that we are concerned with
9 here. But that puts it in a little bit different perspective for you.

10 MR. MEISNER: Well, yeah, you know, but to be a little
11 cynical about it, what you do is you make sure that you have something
12 come up by extending the timeframes, for instance, in recovery so far
13 that they make a difference when you add in human error. I doubt that
14 there is anybody in this room that seriously thinks you are not going to
15 be able to put water back into the spent fuel pool sometime in a week.
16 You know, it is really like you indicated, a matter of procedure and you
17 have thought it out ahead of time. It is going to happen. Yet, you
18 know, you don't see any of that kind of thinking in an operating reactor
19 PRA.

20 MR. KELLY: Well, we did have a case where there was a
21 foreign reactor that allowed its spent fuel pool level to drop
22 significantly, about 16-18 feet before they did anything about it. And
23 that is -- the operators had chosen to let that happen. They didn't
24 think apparently it was probably a concern and then they went ahead and
25 did makeup.

 And so we realized that that is a possibility. I mean it is
not something that happens very frequently, but it is something that did
happen at an actual plant. So, because of that, we considered that it
is something that is a credible type event. People make unusual
decisions.

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1 MS. ORDAZ: As Glenn mentioned, the assumptions in more
2 detail of our preliminary results will be in this report that we plan on
3 issuing in August. And at that time we would like to obtain more
4 information that you might have, more data, in order to refine our
5 results.

6 MR. MEISNER: I understood this was a working meeting where
7 we were going to give feedback and have an interchange. I don't want to
8 wait till August to give you feedback.

9 MR. KELLY: That is why I am happy for your feedback now.

10 MR. MEISNER: We are all hoping that you will take this and
11 do something with it before the report is issued.

12 MR. BRADLEY: Just as a general process question, there is a
13 lot of expertise available in the industry to review the assumptions,
14 sequences, data that went into this report and, given that you have been
15 able to present preliminary conclusions today, why can't the report be
16 made available now so that we can really have a real substantive
17 interchange? I mean you are comfortable enough with it to present some
18 conclusions, so, you know, it seems to fair to get the details out for
19 review.

20 MS. ORDAZ: We are still in the process of completing our
21 preliminary results, but we wanted to provide you with as much
22 information as we could up to this point. And we are going through and
23 finalizing our inputs and our conclusions, and that is our best schedule
24 that we can meet, because we have had such a short, short period of time
25 to do this work.

MR. BRADLEY: Oh, yeah, we understand it would be
preliminary draft, but I guess I don't see what the harm is in providing
the details out now so we get a two month, three month increase in our
ability to do this.

MS. HENDRICKS: Or, in other words, why spend time

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1 finalizing something prior to getting input on your assumptions. They
2 are going to underline the --

3 MR. RICHARDS: They are not talking about finalizing, you
4 know, this is still a work in progress. They are just talking about
5 trying to pull together their words so they have a product in draft that
6 we can put out in public.

7 MS. ORDAZ: And it will be a draft product.

8 MR. RICHARDS: We are not going to pull together a bunch of
9 notes and attach it to a document and put it out in the public right
10 now.

11 MR. RONE: If I may, Art Rone, there is areas where the
12 industry could provide some basic input. Although these probabilities
13 seem low, and they are dominated by human error, you have made some very
14 conservative assumptions about what those human errors are, like in the
15 case of absence of having a procedure for recovering inventory in the
16 pool out at 120 hours. I guess you have given 5 percent probability of
17 that not happening?

18 MR. CHEOK: That is just a 5 percent probability of that not
19 happening, that is recovery from off-site sources.

20 MR. RONE: Okay.

21 MR. CHEOK: I mean that is not counting the recovery from
22 on-site sources using your fire pumps.

23 MR. RONE: Okay. But I think we can provide specific input
24 on what the options are available to us to give you more credible
25 information around which to base the assumptions, and maybe to wring
some of the conservatism out of the human error rates that you have
considered as part of your preliminary results.

MR. RICHARDS: We are headed there. We are looking not only
for the industry's input but also the public. I think the only thing
you are talking about is how fast can we package this thing so that we

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1 are comfortable making it available to everybody. And we are going to
2 try and do that as quickly as we can. You know, I think they are
3 targeting early August. If we can do better than that, fine. Believe
4 me, they are working very hard and as soon as we can get something on to
5 the street for everybody to look at, we will.

6 MS. ORDAZ: And it will be draft.

7 MR. RICHARDS: In coming up to this meeting today, we felt
8 like, hey, we need to keep the dialogue going, so, hence, we are
9 talking. And now I sense a little frustration because now you have had
10 your appetite whetted, you know, why can't we give you everything?
11 Well, we are just not there. The alternative would have been to cancel
12 this meeting and wait until August, until we had a big fat packet to put
13 on the table. We elected to continue the public process.

14 So for everybody who wants to see it, the industry and the
15 public, you know, we will get it to you as quick as we can. But we do
16 appreciate the dialogue. We are interested in hearing what you are
17 saying.

18 MR. RONE: I guess in areas where uncertainty, where you
19 don't know what the response would be, dominates your assumptions with
20 respect to human error rates. The industry can provide that data and we
21 would be willing to provide that data. We need to know what your
22 assumptions are and what you are considering, like, for example, if you
23 need specific information about outside of internal plant sources, how
24 would you makeup to the pool?

25 We can provide a number of scenarios how we would bring in
outside sources of water to makeup to the pool, what is available for
our company resources as well as from local municipal resources. But we
don't know that you need that information, we don't know that you are
considering that. The sooner we know that, the better we can
proactively help provide that input to you.

1 MR. MEISNER: That three pages of assumptions you mentioned,
2 that might be a good starting point, something we can work on and get
3 you information back that may work to change some of those assumptions.

4 MR. RICHARDS: Well, we can't commit to do that, but let's
5 take that suggestion internally and we will talk about it.

6 One thing I would like to point out, I'm sure you have
7 already figured this out but they have done a PRA here on a plant that
8 doesn't exist. We tried to, I think, and I hate to talk for the
9 technical working group, but I think what we have done is we tried to
10 make some fairly conservative assumptions. You know, we're not looking
11 at Maine Yankee or Zion or any particular plant. We are looking at what
12 can happen one year down the road. I think you guys assumed the spent
13 fuel pool that is completely full, is that what I have heard before?
14 And I don't think anybody has got one of those, so we are trying to do a
15 bounding analysis here to see if we could dismiss these things
16 relatively rapidly without a lot of dialogue, and what you have heard
17 today is based on the very preliminary results. The answer is no, we
18 need to talk about it, so that is where we are headed, and I want to
19 keep reminding people we don't have results yet, and what we have is a
20 work in progress, and when you start talking about the results or x, y,
21 or z, the results are still being worked on.

22 MR. MEISNER: That's probably the best time to exchange
23 information.

24 MR. RICHARDS: Right, it is, and hence our discussion today.

25 MR. MEISNER: To see if the assumptions are right.

MS. HENDRICKS: Even setting aside some of the specifics, if
I could make a general comment on the approach, it seems like you are
missing an important opportunity by not -- and we will argue if we say
worst case -- but I did see a lot of bounding analyses.

It's seems like first of all you missed an opportunity for

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1 real insight by doing too much worst case bounding analyses. I mean
2 that is not really how PRAs work best, and then --

3 MR. KELLY: Let me just explain that and I think that is
4 important and I am glad you brought that up.

5 In the deterministic analysis that provided us with things
6 such as how much time do we have available before we boil down the
7 water, how long will it take before -- given that I have uncovered the
8 fuel -- how long would it take for the fuel to heat up to the point that
9 I get a zirconium fire? Those numbers, we did those on a more
10 conservative basis. They weren't the most conservative but they were
11 done in a more conservative manner to make sure that we were not being
12 overly optimistic, and we wanted to see also, you know, from a
13 deterministic standpoint whether this would -- the problem would go
14 away, and when we looked at that we found that, no, it wasn't, it didn't
15 go away.

16 So from the PRA standpoint what was conservative was our
17 times, our recovery times perhaps could be a little better than what was
18 assumed here but the PRA analysis that we performed was by and large a
19 realistic analysis to the extent that we could.

20 When we talk about not wanting to drop the procedural -- the
21 numbers for human error rates below 10 to the minus 4, that is the type
22 of thing that we wouldn't want to do for a operating reactor either,
23 because we don't think that that is the appropriate way to do it. That
24 is not where we have conservatisms.

25 For example, the ideas about there not being procedures for
some of these things, that is based on my going out to the plants and
asking them what procedures they had and that was the answer that I had
gotten, that the procedures were for very slow drain-down events types
of things. It was not for the type of problems that we were considering
here, and because of that I think most of the assumptions that we have

1 made in the PRA aspect would not be considered bounding, which isn't to
2 say we don't have something but I am just saying that primarily this is
3 a -- to the extent that we can -- a realistic analysis.

4 MS. HENDRICKS: Well, the follow-on then to the second point
5 is again I think in terms of coming up a pragmatic regulatory approach,
6 I think you have missed the boat. I think you had an opportunity if you
7 had concerns about procedures to go forward assuming some procedures and
8 in the shorter term come up with a more practical regulatory basis that
9 you could implement in the shorter time, versus, you know, you are
10 studying something with precision and with numbers and quantitating it,
11 where the qualitative -- the ability to disposition some of these things
12 qualitatively seems to have been -- I mean seven days to put water back
13 into a pool and assuming that that won't happen, I mean if there was a
14 foreign reactor or something where there was absolutely no oversight,
15 but why model with that assumption?

16 I mean you have the opportunity as the regulator to put in
17 place an appropriate program. That is what this is all about, not --

18 MR. CHEOK: I think that's fair. We're trying to hear that.
19 As Stu keeps saying, this is a work in progress. By putting this model
20 in place, I don't think we have missed the opportunity. We have set
21 ourselves up with a model that will point up to the right directions as
22 to what is important.

23 As a matter of fact, I have a slew of sensitivity studies
24 with me that tells me if I decrease certain things by a certain percent,
25 what would the result be and I mentioned one of the studies to you.

If I had decreased that 5 percent to 1 percent, a one E
minus 5 becomes a seven E minus 6. I have 30 or so cases like that.

These kinds of studies would basically point us to what becomes
important. I don't think we are missing the opportunity. We created a
model that would point us in the right direction as to whether we should

1 be headed, what we should be looking at, and, you know, this is a work
2 in progress. We have just started and we now have a model in front of
3 us where we can now look at the model and say what is important. In
4 this case it could be procedures.

5 MR. RICHARDS: Without prejudicing the outcome on that, I
6 mean we might end up down the road with a rule that says the licensee
7 must demonstrate that they have some of these procedures we are talking
8 about, maybe administrative controls on fuel movement for cask drops,
9 something to address fire, maybe we'll have a rule that says, hey, if
10 you address these things then that provides us with confidence that some
11 of these events are in the realm low enough in probability that they are
12 not a concern, so we are looking for a technical basis to put something
13 down that is codified that everybody, the public and the industry, can
14 say, yeah, that's what is expected and if you got this, then we can move
15 on to the next step.

16 MS. HENDRICKS: I agree with you, but remember part of the
17 problem that we are trying to remedy here is going on and on with no
18 criteria. I mean there has been a lot of frustration. There's been a
19 lot of what I think NRC would agree is unacceptable regulatory practice
20 in this area, and that is what is trying to be remedied, and the
21 Commission's expectation I think was that it could be done in a
22 relatively reasonable timeframe, and I agree that a lot of study is
23 great and it is interesting and I like it as much as the next person,
24 but your method is going to I think put you off on a course where a
25 study could overtake a more practical objective of coming up with some
criteria in the short term that are in fact very risk-informed and very
supportable.

MR. RICHARDS: Frankly, I am optimistic that we are going to
get exactly what we hoped to get when we started out, and I think we are
just talking about how long it is going to take to get there, and again

1 we will do what we can to move the process along, but quite frankly, the
2 technical results are the technical results. You have got to do the
3 science before you can do the process.

4 We have got to do the science right, and we promised this
5 to be a public process and we are going to follow through on that. That
6 includes your input and the public's input.

7 If we can get the thing out on the street and deal with the
8 details in a short time, we will move that timeframe up.

9 MS. ORDAZ: And that is why we lengthened the timeframe, so
10 we can make sure we included public stakeholders' comments and anything
11 they may be able to provide us, instead of issuing the entire report in
12 June.

13 MR. BRADLEY: I think this is more than just dealing with
14 details. I think there are fundamental issues here. A bounding PRA is
15 an unusual animal in my experience, and it is more than a detail issue
16 how some of these numbers have evolved and the fact that you have got a
17 frequency here that is about the same or greater than a release for an
18 operating plant.

19 I mean that on its face seems to merit a lot more study.

20 MR. KELLY: We agree, but again I want to reiterate that
21 this is not a bounding PRA.

22 MR. BRADLEY: Well, I mean I heard enough in just the brief
23 snippet we heard on fire to question judgment. You know, 10 percent of
24 the fires large enough to lose offsite power are pump -- you know, some
25 of these initiating event frequencies, I would like to see how those
were scaled from an operating plant to a decommissioned plant based on
the number of sources you have.

MR. KELLY: You know, you have to realize there's a lot
of -- for example, loss of offsite power is a very important point, but
this is not necessarily a site that has three independent offsite power

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1 lines going into it anymore. This may be a site that has only one
2 offsite power line going in.

3 All of the power going in to handle the spent fuel pool
4 cooling systems comes off of the same bus, so now you are talking about
5 a fire that would take out one bus -- it would take out everything. You
6 don't have that in an operating plant.

7 MR. BRADLEY: I recognize there are differences. I guess
8 the only point I am making, I think you can't have a real dialogue on
9 this until we have the details, the sequences, the HRA assumptions, the
10 database you use to derive your frequencies. All those things are key.

11 I mean otherwise we are just going to have a hollow
12 discussion here until we have substance before us.

13 MR. KELLY: Right. I mean the key is that we have performed
14 a lot of work in a very short period, and we have got event trees and
15 fault trees and we have got the data and all these other things --

16 MR. BRADLEY: Right.

17 MR. KELLY: -- and the process of putting that all together
18 and putting it in a package that is going to be understandable to people
19 and along with the deterministic analyses and the things that were done
20 there and the assumptions and how we laid that all out and what was done
21 there, so that it makes a coherent story about what we looked at and
22 what we came up with as a preliminary set of insights about what was
23 going on.

24 As I say, we are going to make that available to you as
25 quickly as we can.

MR. MEISNER: And I guess what you are hearing is why not
share it right away? Why not get the feedback, and I think it will be
pretty constructive feedback, that would make the --

MR. KELLY: I understand, but we are right now --

MR. MEISNER: -- initial draft better than what it is now.

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1 MR. KELLY: -- the reports, it's early. I mean we have
2 just -- you know, we have only had this report together -- you know, we
3 had 16 different technical experts providing input into this report.
4 You get 16 different people writing things. It is a challenge now to
5 put that all together and to make sense out of it, and to make it all
6 work in a coherent manner.

7 MR. MEISNER: You have got some critical assumptions in
8 there that really drive the results, and in our minds are probably
9 inappropriate.

10 Why not get into that dialogue now and share that
11 information?

12 MR. BARRETT: I think that a key point here, Mike, is that
13 if we can document this thing well, so that it can be easily understood
14 by yourself and by other stakeholders and it can form the basis for a
15 productive dialogue that can, as Stu said earlier, that could converge
16 on some sensible regulatory positions, if we put it out prematurely the
17 problem might be that it would become a discredited piece of work, and
18 it would not form the basis for that dialogue and might in fact cause a
19 delay or force us to go back and run through the whole thing again.

20 I think that the month or so that we -- or two -- that we
21 want to invest in making this into a credible and understandable first
22 shot at the technical situation will be well worth it, but if we were
23 able to do it sooner we'll certainly put it out sooner.

24 MR. MEISNER: We are talking about not putting out a full
25 product for our review, but give us the set of assumptions, you know,
the things that we have been discussing most of this morning. Why not
get some consensus on that going in?

MR. BARRETT: Because we don't want to have a document that
is discredited before it has an opportunity to lay out the entire story
of what was analyzed. We recognize that there are places, particularly

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1 in the deterministic analysis, not in the PRA analysis but in the
2 deterministic analysis where there are conservatisms. We want to have
3 the opportunity to lay out the entire picture so that people can
4 understand what the NRC was trying to accomplish by making these
5 assumptions.

6 If we just put out fragments of information, it becomes
7 vulnerable to being discredited as a piece of technical work which was
8 not taken seriously, would not be taken seriously ever.

9 That is our biggest concern.

10 MS. ORDAZ: I would like to add that the technical working
11 group is working at full capacity if not more in most cases and it does
12 take a process that we have to go through as well, a concurrence
13 process, through management and everybody, in order to get it out even
14 in a draft form, so we are working to that and we are working very hard,
15 and that will be in a forum for both NEI and the public as well.

16 MR. RICHARDS: We are going to take your comments, anybody
17 else who makes a comment today and go back and mull it over and decide
18 how we are going to do it. We are telling you what our intentions are
19 today. But we are here for some dialogue and we are trying to keep an
20 open mind.

21 MR. MEISNER: Okay. I assume the rest of these slow-acting
22 events all get down to the same thing, whether you get 120 hours to
23 recover.

24 MR. CHEOK: Most of these cases, that is true.

25 MR. MEISNER: Though with maybe the exception of the
aircraft impact.

MR. CHEOK: We have the seismic, the cask drop, the tornado
missile, and the aircraft, which are fast moving. The loss of coolant
inventory, we actually have a small class of that initiator where we
have a larger than small loss where we could have a loss of level to

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1 about four to five feet above the fuel level, in which case you have 30
2 hours for recovery, as opposed to your 120 hours. That is a small
3 fraction of the --

4 MR. MEISNER: What is your thinking now on the seismic
5 event?

6 MR. CHEOK: On the seismic event, basically, what -- the
7 assumptions that was made for the seismic event is that we are assuming
8 that the pool is built to resist -- the ruggedness of the pool is three
9 times SSC, and looking at the Livermore curves and the EPRI curves, for
10 a .4 to .5 g earthquake, we come up with an initiating event frequency
11 of roughly 2 times 10 to the minus 5. Then assuming a typical fragility
12 curve, we come up with 1 times 10 to the minus 6. Frequency of uncover
13 from the seismic event itself for failing the pool, we have another 1
14 times 10 to the minus 6 for failing cooling equipment, not the pool
15 itself. Given the fact the pool is intact, we can fail the pumps or any
16 makeup equipment, in which case then we have makeup from off-site
17 sources.

18 MR. MEISNER: I guess I am not a PRA expert, but I guess --
19 what you are saying is you have really not changed your view on the
20 frequency of a zirc fire associated with seismic.

21 MR. CHEOK: We basically, I mean -- the zirc fire, I mean
22 the zirc part of it is --

23 MR. KELLY: Independent of whether it is seismic or not.
24 What was -- I am not sure I understand you.

25 MR. CHEOK: All we are calculating is the frequency of --

MR. RICHARDS: I think what he is asking you is they brought
some information to the table --

MR. MEISNER: My recollection is 2 times 10 to the minus 6
-- 1353.

MR. CHEOK: You brought some information to the table that

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1 the seismic frequencies would be a lot lower if we had used the
2 Livermore curves. We used the Livermore curves to determine the
3 frequencies of seismic events that could be three times SSC, which is
4 what we assumed to be the ruggedness of your pool.

5 MR. RICHARDS: So the information that was referenced by NEI
6 in previous meetings --

7 MR. CHEOK: Is used by us, correct. Actually, we looked at
8 --

9 MR. MEISNER: Here is my simplistic view of this, 1353 said
10 a seismic hazard, what 2 times 10 to the minus 6th, if I remember
11 correctly. You are saying now, after applying the Livermore curves, it
12 has now cut that in half, to 1 times 10 to the minus 6. Am I
13 interpreting that correctly?

14 MR. CHEOK: I am saying that for your typical plant, I am
15 looking at the whole range of plants where a .4 to .5 g earthquake, a
16 frequency for a .4 to .5 g earthquake would and it is occurring at about
17 2 times 10 to the minus 5 pu, that is my initiating event frequency for
18 a seismic event that would be three times SSC, for your typical plant.

19 Given that, if you take, let's say, you take your definition
20 for -- your 5 percent probability of failure, you multiply it by 05, for
21 example, but you have 2 times 10 to the minus 5, you get your 10 to the
22 minus 6. That is a very simple bounding type calculation. But your
23 frequencies themselves come from your Livermore report, or your EPRI
24 report.

25 MR. KELLY: Right. Now, to help you understand this, we
don't have actual analyses of the spent fuel pools themselves. So what
we did is we said that we assumed that the spent fuel pools would be
capable of withstanding, without any significant damage, up to three
times the SSC. We just assumed that once you got in excess of three
times the SSC, you are going to cause significant damage to the pool, to

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1 the point that you get rapid loss of inventory in the pool.

2 Now, it may be that on a plant-specific basis, people,
3 knowing the details of the structural -- the structural details of the
4 pool and that, that they can say, oh, no, we are good for five times
5 whatever their SSC. But the thing that -- where you run into this is
6 that, you know, we have these numbers, and then when you look at the
7 hazard curves, the hazard curves are pretty vertical at this point,
8 which means that the return frequency for -- there is not much
9 difference, you know, to go from one g level to a next g level. When
10 you are out at the fairly high g levels, you are -- the change in
11 frequency is not that great. Okay. And that is due in part to the
12 uncertainty associated with these large earthquakes, and just how the
13 seismic experts around the world go about determining what is the
14 frequency for these return periods.

15 MR. MEISNER: I guess, like I said, I am not intimate with
16 those calculations, but just my simplistic look at it says that with new
17 information, you came out with the same result as 1353 had. You,
18 however, did not take the same approach.

19 MR. KELLY: Well, we didn't start out to do that. Right.
20 And what we did end up with was different, I think is that we also
21 included the contribution from the failure of the cooling equipment.
22 And I think that the 1353 only looked at failure of the spent fuel pool
23 itself. And we also considered the possibility of failing the cooling
24 equipment and then having off-site recovery not work for them.

25 MS. HENDRICKS: So that is an area that also includes an
assumption that you would have a week and not be able to get water back.

MR. KELLY: Right. That is what brings it to the 10 to the
minus 6, because we are assuming that you are going to lose the spent
fuel pool cooling system at a lot lower frequency than -- you are not
going to go to three times SSC to lose something that is sitting on a

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1 skid, it is going to fail at a lot lower level than that. So we were
2 looking at a very low probability that you don't recover from off-site,
3 but still it contributed half of that, 1 times 10 to the minus 6 came
4 from losing the spent fuel pool cooling system and 1 times to the minus
5 6 comes from losing the pool itself.

6 MR. BRADLEY: Do you expect this result for this portion of
7 the hazard to be any different for an operating plant? Does this
8 comport with what you see for catastrophic earthquakes for operating
9 plants, since the assumptions would be basically the same?

10 MR. KELLY: Well, at operating plants, at those levels you
11 are going to be damaging the core, the internal structure of the core,
12 and you are going to be having probably a core damage event if you are
13 three times SSC.

14 MR. BRADLEY: Did you review some of the operating PRAs to
15 see if this was -- I mean I don't know, but I am just curious if you did
16 a check on that to see if this is --

17 MR. KELLY: Well, I know the fragility of cores and so that
18 would be my expectation. You, Tom or Bob might want to talk about that.

19 MR. ROTH: I think -- this is Bob Roth. In past PRA,
20 seismic PRAs, you start seeing core damage at about two times the SSC,
21 and here they are talking about three.

22 Well, one thing I wanted to ask you, Glenn, I haven't
23 reviewed this, but when you were doing your seismic, did you also
24 consider the effects of the earthquakes? When you are doing the seismic
25 analysis, the seismic portion of this, did you also consider the effect
of the earthquakes on off-site power or just on the spent fuel pool
itself?

MR. CHEOK: When you look at the loss of off-site power from
events initiated by a severe accident, or severe weather, we assume that
the loss of off-site power from seismic events is enveloped in that

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1 event, events initiated by severe weather where recovery of off-site is
2 a lot less probable.

3 MR. ROTH: I think because you lose off-site power ground
4 motions a lot lower than the SSC ground motion --

5 MR. KELLY: We have included that in the other area.

6 MR. ROTH: Okay. That is what I was wondering, had you
7 considered that.

8 MR. KELLY: Yes.

9 MR. ROTH: Okay.

10 MR. RONE: In the area of cask drop, what is dominating that
11 probability, is that the human error also?

12 MR. KELLY: Yes.

13 MR. RONE: Are you equally balanced with equipment failure?

14 MR. KELLY: The human error dominates that and that is based
15 on Department of Energy studies at their fuel facilities and determining
16 that that is human error. It tends not to be the equipment itself but
17 the rigging or the operator just doing the wrong thing, having a bad day
18 and doing something he is not supposed to do.

19 MR. RICHARDS: One of the things on the cask drop we talked
20 about internally, and we haven't had a chance I think to develop it with
21 the timeframe that they were doing, but, for instance, we just issued an
22 amendment to Trojan to allow them to move fuel and to move casks. And I
23 know in reading that amendment there were a lot of administrative
24 controls and there were measures taken to preclude a cask drop from
25 causing a problem. So, you know, it is that kind of information we need
to factor into, you know, into the risk analysis to put it in
perspective. So, you know, it is that kind of information we are
seeking from you and from ourselves internally with what we know.

MR. RONE: That is exactly right. I know in the case of our
own plant, when we are moving heavy loads, we would have a dedicated

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1 crew. That crew would receive special training. There would be
2 additional engineering oversight of the rigging and lifting. And we do
3 all of those things to squeeze out whatever the human error component is
4 of failure. And it is not clear to me whether or not those kinds of
5 special precautions and activities were considered when you looked at
6 the human error rate's contribution to cask drop.

7 MR. KELLY: The numbers that we had were based on the
8 experience from the Department of Energy and I don't know to what extent
9 that reflects similar practices here to what you were just speaking
10 about. It may be that, you know, as we get a better understanding of
11 what the actual practices are -- I am not sure whether this is a
12 voluntary thing that you are doing at your site or whether there is
13 something that constrains you to do that on a regulatory basis to do
14 that. But assuming that even on a voluntary basis that you are doing
15 it, that would be important information for us to have and I know that
16 some sites also have these -- in certain parts of their pool, they will
17 have kind of like a cask catcher.

18 MR. RONE: A cask drop protection system.

19 MR. KELLY: Right. That acts to absorb the impact of any
20 cask it might have on the pool and that is it. Another thing, if that
21 is in place -- you know, we looked at it, we looked at the potential
22 problems associated with dropping a cask on the edge on the pool or
23 dropping it a gate or a weir or something like that, and what type of
24 damage that could do. And these are things that we will want to explore
25 further.

Again, we have -- you know, this has provided for us an
indication that it is a potential problem. There may well be things
that are happening out there that make this to be a lower number than
what we see here. We have seen actual experience where people lift
things too high, take it where it is not supposed to go, go through

1 stops and things like that, don't necessarily follow the administrative
2 procedures. So having administrative procedures is certainly important.
3 It doesn't in and of itself though preclude you from doing something
4 that you shouldn't be doing, because we see that happen in reality.

5 MR. RONE: It wouldn't preclude it but it would reduce the
6 human error component.

7 MR. KELLY: That is correct. Although one of the
8 conclusions that came out of the Department of Energy report was that
9 procedures in and of themselves tend not to be enough because they were
10 saying that it is -- the human error rates are things that, you know,
11 people always seem to find a way to get around the procedure if it is
12 possible and so, therefore, you can't just say that I have a procedure
13 and I am going to check real carefully and not do that. Because you can
14 reduce it, I mean you can do as much as you can, but are never going to
15 make it go away.

16 MR. RONE: And I would agree that one thing by itself, just
17 having a procedure may not be enough. And when you backed it up with
18 other requirements such as dedicated crews, specialized training,
19 engineering oversight, QA oversight, when you looked at what is the
20 probability of all of that collectively failing and resulting in a human
21 error that causes the cask drop, I think that is a very different
22 picture than just simply saying, well, I have procedure and I follow the
23 procedure.

24 MR. KELLY: Right. And as I said, as we get feedback about
25 things like that, that are out there that are happening in real life,
this will be important to help us adjust our values and to get a better
perspective about the risk. You know, we have done the best we could in
a short period to provide a very broad picture about where the potential
risks are. You know, as you can help us to better understand what is
really going on out there, we will improve the picture.

1 MS. HENDRICKS: It kind of goes again to this issue not so
2 much of specifics, but to your basis approach, the pragmatism, I would
3 say, of your basis approach, because I recall when Gary Holahan laid his
4 issues out, he clearly indicated at that point that credit would be
5 given for good practice, it didn't have to be a regulatory requirement.
6 So, in terms of your basic approach, I think, again, I don't want to be
7 too negative, because I do appreciate that it is preliminary, but I
8 think you are missing an opportunity to get more insight and more done
9 sooner through a more pragmatic approach versus waiting. I mean --

10 MR. KELLY: Well, see, there is a difference. When we
11 perform a PRA, we generally don't perform a PRA the way we think we
12 would like the plant to be. We generally do it the way we think the
13 plant is. And then we will modify it and look to see how it would
14 improve or get worse if they did things differently, or the plant was
15 built differently.

16 What we did here is, you know, again, this was a very quick
17 turnaround risk assessment based on going to four sites and the
18 information that I saw there and what I was able to able to gather in
19 that week of going to plants. It is not a complete picture and I
20 understand that there may be areas that could be improved by more
21 information. And we are certainly willing to that, we are interested in
22 doing that. But we based on our models on what we saw and not what we
23 hoped to find. And, therefore, you know, it wasn't how we -- we
24 thought, gee, if you went ahead and you did the following things, well,
25 we can give you more credit. This is, you know, what we saw when we out
there.

MS. HENDRICKS: That seems a little bit contradictory
because hearing from Art and Mike and all the plants I know, they seem
to have a lot of procedures on heavy loads, for example. And I know you
have access to the dockets for the SRPs and the different things they

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1 have submitted to you in the context of tech specs and DSARs and all
2 this other stuff. So I am little perplexed that on the one hand you are
3 saying you are using what you saw and it doesn't seem to agree with, you
4 know, procedures.

5 MR. MEISNER: A real simple example, we are not allowed to
6 move casks. We don't have a tech spec for it.

7 MR. KELLY: Okay. And as I say, this does not represent any
8 one plant. It represents a potential plant at a particular time with a
9 particular configuration.

10 MR. MEISNER: But the point is, it is a tech spec controlled
11 activity that has all the associated procedures, training and whatever
12 goes along with it.

13 MR. KELLY: Right. And we would certainly -- and we would
14 say that your risk would be very low if you don't move anything. And we
15 would agree with that. And if everybody had that tech spec, then we
16 wouldn't be concerned with cask drop, we don't see that.

17 MS. HENDRICKS: But it seems to represent a plant
18 independent of any regulatory program. I mean when you gave your
19 example of what had happened in, I guess, a foreign plant where somebody
20 walked away for a week and didn't notice that the -- didn't take any
21 action. I mean how does that comport with the statement that you are
22 going to, you know, represent what is likely?

23 MR. RICHARDS: Well, that is all good feedback and we
24 appreciate the comments and the criticism, but it is a preliminary
25 product. We are bringing you something that is 60 days down the road.
It is not in final. I think Gary's comment to you is probably correct,
because we will get feedback from you and other interested parties and
we will incorporate that into the product. We can't have it both ways.
We can't sit here 60 days into it and give you, you know, a final
product that has considered all the procedures. It couldn't have been

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1 done in 60 days. So I guess our options were, you know, to wait six
2 months and give you something that had gone through a lot more
3 consideration before we ever talked to anybody, or to sit here and tell
4 you where we are at today and seek yours and others' feedback. You
5 can't have it both ways.

6 MS. HENDRICKS: It does go to your basic approach, I mean,
7 and what I hear is that the basic approach is going to be carried out to
8 the, you know, with sensitivity studies. And I'd like to see, I guess,
9 some correction in the direction of the basic approach. That's the
10 point I'm making.

11 MS. ORDAZ: It may change. It just depends on what we get
12 through this independent review process. And that will be a work in
13 process as it goes along as well, and at that time we'll be able to get
14 some feedback from everybody on plant-specific initiatives or whether
15 they're generic like Art was mentioning. But, you know, we have to
16 gather our information that we do have, get it to you, and then go
17 through that process so we can get all the data available that's out
18 there.

19 MR. KELLY: Right. See, one of the things -- and I'm glad
20 you brought up the question about things like what's going on with the
21 casks and the movement of heavy loads and that, because I believe all
22 the plants have committed to meeting the requirements, and I've
23 forgotten the particular NUREG -- right, 612. But when a plant goes and
24 becomes decommissioned, and this is -- there are things that a utility
25 was formerly committed to doing something, but then in going into the
DSAR and that they kind of decommit doing these things because they say
they're no longer required and no longer necessary.

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You know, we in the PRA gave you credit for all types of
equipment, not just equipment that was safety-grade or just whatever. I
mean, we looked at the instrumentation and whether it was good, bad, or

1 indifferent instrumentation. We treated it as instrumentation. It was
2 something that would provide the operator with information. It didn't
3 have to be any type of particular quality or whatever for us to give you
4 credit for it.

5 It wasn't clear to us whether or not in going into
6 decommissioning whether a utility would retain its commitments to things
7 like 612 or whether or not they've backed off from that and a lot of
8 other things, and we're no longer going to have to follow those type of
9 things, because we know that, for example, one of the things that
10 utilities will do is they'll come in and ask to have their tech specs
11 significantly modified to more adequately reflect what they want to do
12 with the plan, and, you know, take out their RHR systems and the diesel
13 generators and things like that. So because of that, and again because
14 we had to do this so quickly, we went in not sure exactly what the
15 status was at plants, and we didn't have time to do that research and we
16 could only do so many things in parallel.

17 So we understand that we may have missed some things here,
18 and we hope that you'll point out to us where there's something that
19 maybe we have not understood what this industry practices or what the
20 industry's committed to. But clearly, you know, we want to do our best
21 to -- when we laid this PRA out -- to do the best to our understanding
22 about how things might be working at the plant. And we know it's not
23 perfect, but it was the best that we could do in a short period.

24 MR. RICHARDS: I don't think we should apologize for it. I
25 mean --

MR. KELLY: No, I think it's a good piece of work.

MR. RICHARDS: What you've done is what you've done. It's a
work in progress, and we're sharing it publicly for your feedback. So,
& you know, we're working through it.

MR. BARRETT: The other thing to consider too is that we

1 know, as Glenn said, that a lot of what we saw at the plants is based on
2 the historical experience with decommissioning. It's possible that in
3 the future decommissioning will be a different kind of business than it
4 has been in the past. Many of the plants that have decommissioned in
5 the past have done so under circumstances which did not allow a great
6 deal of free planning. It could very well be that in the future the
7 amount of thinking that a utility does going into decommissioning could
8 start years in advance of the process, and so that going into
9 decommissioning on the very day that you start decommissioning, you
10 could be in a very different regulatory configuration, you could be in a
11 very different -- moving rapidly to a different plant configuration.

12 These are all possibilities that we kept in the back of our
13 minds as we were doing this analysis. And so by laying out the what
14 I'll call the technical landscape here and allowing us to have a
15 dialogue on the full range of issues that are important, we can come to
16 a conclusion that reflects the way the plants are today and the way the
17 plants might be in the future.

18 MR. HUBBARD: One question that kind of follows in line with
19 what Rich was saying is, you know, something we've been wrestling with,
20 and I think it came out in the assumptions, is we looked at the plants
21 the way Glenn found them, you know, at that -- you know, when he
22 visited, and we realize, I think, every one of those plants is greater
23 than two years old, is how quick do you get to the simplistic plant from
24 the standpoint of I think most of the plants that are decommissioned
25 now, it wasn't a planned thing.

And, you know, we're looking at, you know, Mike's plant from
the standpoint that you're very simplistic in your cooling, and that
took you some time to get there. They have one of the inputs that you
can be thinking about, and maybe you've got some thoughts today is, you
know, if you do preplanning or -- when do you start getting into that

1 position of getting the very simplistic is it early on or are we talking
2 later, you know, because, you know, in our PRA we looked at, you know,
3 one year you had a simplistic plant. Now is that realistic? I don't
4 know. And --

5 MR. MEISNER: I think the general answer is it's a function
6 of your deterministic analyses and heat-up and boil-down times in large
7 measure.

8 MR. HUBBARD: Okay.

9 MR. MEISNER: And being able to put in a cooling system that
10 can accommodate those heat capacities.

11 MR. RONE: In the case --

12 MR. MEISNER: And of course it's done under 50.59.

13 MR. RONE: In the case of Oyster Creek, and Oyster Creek is
14 at least one of the early plants that does have a couple of years to do
15 preplanning, we've speced out our alternate fuel pool cooling system to
16 go into service one year after shutdown. So your assumption in that
17 regard was fairly right.

18 MR. HUBBARD: Okay. So that was pretty accurate. Okay.
19 And by that you would -- would that be a whole new cooling system, or --

20 MR. RONE: Yes, that would be a whole new cooling system.
21 But just some of the things that are important to us is we're doing a
22 failure modes and effects analysis on the system. It's already
23 preliminarily designed. We're doing a full PRA on it to determine what
24 is the probability of failure of that system. If there's a different
25 safety goal that we have to have, for example, operator errors, make it
more robust for operator errors, us knowing that earlier rather than
later would help in our design of that system. So, you know, what
you've done here is very much relevant to the planning that we're
currently doing.

MR. HUBBARD: Okay. I guess the other question, since Mike

1 brought it up, I know we've had several questions, and maybe you're
2 going to talk to it this afternoon or whatever, you brought up the 50.59
3 question. And we've had several questions that have come to us
4 regarding, okay, you're using 50.59, we understand that process, is not
5 just say 50.59, what are some of your thoughts, you know, that you go
6 through when you're eliminating these systems.

7 Now I guess Mike alluded to where you're looking at heat
8 loads and this and that, but -- or if you're going to talk about it this
9 afternoon more, the actual process for 50.59 rather than just saying we
10 do 50.59 because we've had some questions as to well, what are you
11 eliminating, you know, the, you know, there was surprise when Glenn came
12 back that the systems were now so simplistic, and it was well, how do
13 they do that? And our answer was of course 50.59, and it was well, how
14 can they eliminate the spent-fuel-pool cooling, you know, and I was
15 wondering if you had any comments in a little more detail than --

16 MR. MEISNER: I'll give you some general comments, just in
17 general.

18 MR. RICHARDS: Could I just caveat his comment for the
19 record here? When he says there was some surprise, obviously we have
20 inspectors who are onsite, you know, we're dealing with these plants, so
21 let's -- when you say we're surprised, we're talking about the technical
22 working group, not --

23 MR. HUBBARD: Right.

24 MR. RICHARDS: The NRC as a whole here, oh, geez, what
25 happened to that diesel.

[Laughter.]

MR. MEISNER: We had an onsite inspector through that whole
process who went over the 50.59s in detail and sat in on all of our
discussions. The general design approach was to have a self-contained
cooling system, so we added the cooling system for the spent-fuel pool

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1 so that we could turn the rest of the plant what we call cold and dark.
2 Wanted the decommissioning to proceed in such a way, the actual D&D work
3 to proceed in such a way that it couldn't have any adverse impact on
4 fuel management, which is something else I think you need to take into
5 account when you do these PRAs.

6 So we wanted to go to such a system, particularly since
7 we've been shut down for a couple years, as soon as we could, so that we
8 would minimize the impact of the decommissioning on our major safety
9 function left, fuel management. You know, we did this under 50.59, and
10 it's a straightforward process, because the systems that you're
11 eliminating all serve no function anymore. They're replaced by a
12 cooling system, and you're cutting all the ties, whether they're
13 mechanical, electrical, water ties with the rest of the facility.

14 That's just big picture. I don't know if I answered your
15 question.

16 MR. KELLY: I think probably more in detail we'd like to
17 discuss a little bit about some of the understanding of like where
18 before you had seismic makeup capability and that was part of your
19 design basis where you had RHR as a backup, both as a cooling system and
20 as a makeup source, and then you go from that to a 20 gpm makeup source
21 that's not seismic category 1. To get an understanding of what was the
22 basis for that, you know, in your minds as you laid that out.

23 And I understand part of that, because a lot of this has to
24 do in 50.59 when -- talk about an unreviewed safety question with design
25 basis accidents, and we're really not talking about design basis
accidents here, we're talking about beyond design basis accidents, which
is what EP is concerned with in your insurance. So if you could help us
out, and maybe the answer will be that well, you weren't required to
consider that and therefore, you know --

MR. MEISNER: In fact, most of the spent-fuel pool and

1 associated systems, if you check our FSAR, are nonsafety-related but
2 seismic. We put back into place voluntarily, not by requirement, a
3 level of quality assurance, augmented QA I think, most plants use it to
4 some degree or another, where you're kind of selective in the standards
5 that you apply. And as far as seismic qualification, if you check our
6 SAR I think you'll find that most of it is seismically qualified. And
7 I'm fuzzy on the original design basis of Maine Yankee, but I believe
8 some of the qualification was tied to RHR and its operating
9 characteristics as opposed to simply spent-fuel management.

10 You mentioned RHR as a backup.

11 MR. KELLY: Right.

12 MR. MEISNER: The pedigree is different.

13 MR. KELLY: It depends on the plant.

14 MR. MEISNER: The pedigree is different depending on what
15 its operating function was --

16 MR. KELLY: Right.

17 MR. MEISNER: Its decommissioning function.

18 MR. KELLY: Right.

19 MR. MEISNER: But like I said, we've had inspectors in there
20 going over that up, down, and sideways. I'm a little surprised today
21 that you would be surprised, and be happy to send you all our documents
22 on it.

23 MR. KELLY: I appreciate that. It's just, you know, the PRA
24 folks don't have that much time to read those inspection reports, and so
25 we tend to -- it came as a surprise that so much equipment was gone from
the plant --

MR. MEISNER: That's what we do in decommissioning.

MR. KELLY: Right.

MR. MEISNER: We tear it down.

MS. ORDAZ: And I think we're more interested in the time

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1 frame, you know, is it within the first three years, is it beyond -- or
2 however many years is it beyond that.

3 MR. MEISNER: If you are trying to tie that to a beyond
4 design basis event like zirc fire, that's inappropriate; 50.59 is for
5 the license and design basis of the plant.

6 MR. KELLY: I understand. But the reason why we're
7 performing our risk assessment here is because there was interest in
8 potentially providing a more level playing field for granting exemptions
9 or perhaps forming a rule dealing with beyond design basis events,
10 because that's what EP deals with. And it's true that 50.59 only deals
11 with design basis events, but what we're saying now is that we're
12 looking to see how the industry's use of 50.59, which deals with design
13 basis events, potentially affects the plant's ability to deal with
14 beyond design basis events, because if it, you know, it's something that
15 we have to look at and see the potential consequences.

16 MR. MEISNER: Sure. But I would suggest that 50.59 isn't
17 the issue. A good understanding of how the plants are designed for
18 decommissioning is the answer, and looking at the various makeup
19 sources, procedures, and whatever that we have.

20 MR. KELLY: All right. But in part for us it's to help us
21 understand historically what's been going on and to have us have an
22 appreciation, because the time period is very important for us, because
23 we realize that there are only windows of vulnerability for a plant for
24 a zirconium fire. Past a certain date for every plant it doesn't matter
25 what you do, you can't create a fire there with zirconium. There's just
not enough decay heat in there to heat it up to that point.

So once you've passed by that, EP I would expect, and this
is not the Commission's -- I'm not speaking for the Commission, just for
myself from a PRA standpoint, you're not getting -- it doesn't provide
you that benefit because there's not going to be any offsite releases

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1 without the zirconium fire.

2 MR. MEISNER: And as we talked about before the Commission,
3 what that amounts to is a zero-risk mind set, and as long as we continue
4 to think and talk in that way, we're never going to risk-inform
5 decommissioning. If the bottom line backstop is always a "can't
6 happen," then you all haven't done I don't think what the Commission has
7 chartered you to do.

8 MR. KELLY: I agree. But it's also important for us to
9 understand what that period is. If that period is a month, or three
10 years or five years or ten years, it's a big difference. And what we --

11 MR. MEISNER: And from a risk-informed point of view, it's
12 not.

13 MR. KELLY: Well, because the length of that period has an
14 impact on how much risk there's going to be. If the period is very
15 short, then -- and given that I have a -- assuming that it was a
16 constant risk per unit time, then the total risk would be short. If it
17 was a long period, at the same risk per unit time, I'd have a higher,
18 potentially a much higher risk, depending on how long the period was.
19 So we're interested in that from a deterministic standpoint as a matter
20 of just telling us, you know, from a prudence to understand over what
21 period do we have that vulnerability.

22 MR. MEISNER: This issue would be a whole lot easier if zirc
23 fire never went away, from the point of view of resolving the problems
24 that we have in risk-informing the area. It's the seductiveness of the
25 possibility of that thing going away at some point that's been driving
all the problems we've had for years in this area. I think we need to
throw that notion away and get down to determining once and for all what
is the real risk -- risk, not can a zirc fire happen, but probability
times consequences.

MR. KELLY: Right. In looking at this, though, I think

1 there's an important distinction between being risk-based and
2 risk-informed. When we're risk-informed we also understand if you go to
3 our new regs that we've written about licensing basis and how we want to
4 go about if someone wants to look at making changes to the plant that
5 affects risk.

6 We're saying that not only do we expect the increase in risk
7 to be small, but we also want to make sure that we're maintaining a
8 margin of safety, maintaining various levels of defense in depth, and so
9 what we're trying to understand here also in looking at our risk
10 assessment is how much margin of safety we have, what kind of
11 defense-in-depth do we have that's still maintained there. And we're
12 not basing our decision strictly on the bottom-line risk number. That's
13 an adjunct to our deterministic evaluations, because risk-informed does
14 not mean that we just look at the risk number, it means that we use that
15 to help us make prudent use of everybody's resources -- ours and yours
16 and the public's.

17 MR. BRADLEY: I don't disagree that you have a risk-informed
18 approach here rather than risk-based, but there is I think a distinction
19 between the documents you're referred to which are looking at changes to
20 the current licensing basis and viewing them in the context of an
21 existing safety goal for an operating plant.

22 Here you are trying, it seems in my mind, to establish -- I
23 guess I am not clear. Are we looking at the same large early release
24 frequency safety goal, and is it the absolute context that we are
25 working with here, or is there an idea that there is a different
ultimate measure of risk that you invoke once a plant is decommissioned?

MR. RICHARDS: Going back to where we started, a number of
years ago a question came up should we consider a zirc fire for
decommissioning plants and clearly we have been because we have been
dealing with these exemptions on that basis, so the question came up, I

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1 think, whether that was the right event to be considering. Does it
2 happen enough? Is the risk high enough to consider? So it drove us to
3 have this group go off and rethink is zirc fire the right thing, and
4 that is what we are trying to put in perspective. That is what you want
5 us to do, right? Is that really a problem or not, and that is what we
6 are trying to do.

7 MR. BARRETT: I think you are talking about a level of
8 thinking that is beyond where we are right now.

9 As we pointed out earlier, as Mike said, risk is basically
10 frequency times consequences. We looked at the three components that
11 would be important to frequency times consequences here, and that is
12 frequency of fuel uncover, which we used as a surrogate for frequency
13 of zirconium fire, the deterministic evaluation of whether or not a
14 zirconium fire can happen or whether it can happen in a timeframe that
15 would affect EP, and then the consequences in terms of doses from a zirc
16 fire.

17 We looked at all three of those and none of those three in
18 our preliminary analysis was sufficient to make the problem look like it
19 could be dismissed.

20 The next level of thinking would be to say, okay, well, if
21 you put all of this information together and you started asking yourself
22 about criteria and how it related to safety goals, that is a ways away.
23 We have started thinking about it, but we are not at a point where we
24 can say, well here is where we are headed. We are just not at that
25 level of sophistication right now.

MR. BRADLEY: Right. Maybe it's a large release frequency,
since you are talking about EP and the difference in LERF and LRF -- is
the overall context -- I guess you are just saying that that hasn't been
established --

MR. MEISNER: Rich, why would it be any different than you

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1 have always used? Why do we keep inventing new things for
2 decommissioning?

3 MR. BARRETT: I don't think it's necessarily inventing new
4 things. I think that it could very well be that we could use very
5 similar criteria.

6 One of the things we think we might want to do as a starting
7 point is to take the Regulatory Guide 1.174 and rather than using the
8 criteria, step back one notch and say let's look at the safety
9 principles, and the safety principles relate, as Glenn said, to
10 defense-in-depth, margin of safety, probabilities or changes in
11 probabilities and frequencies and risk, and putting systems in place to
12 monitor performance and start there to develop criteria, because when
13 you take a quick look at it, it's not exactly analogous. The cases are
14 not exactly analogous, so we are just not far enough along in the
15 thinking.

16 It could very well be -- we certainly don't want to reinvent
17 the wheel. You are right, Mike.

18 MS. HENDRICKS: To kind of take it instead of from the
19 bottom up, I guess from the top down it seems to me that if you would
20 just say that something could happen in seven days then your ability to
21 influence the risk by any of these added requirements is not there.

22 I mean do you realize that? It all hinges on that. If you
23 can in seven days put water back into the pool, you have no ability no
24 matter how broad the requirements, no matter how onerous they are, to
25 have any effect whatsoever on the ultimate risk.

MR. BARRETT: Well, for some of the scenarios that is true.
If you could establish --

MR. RICHARDS: For the great majority of them.

MS. HENDRICKS: Virtually all.

MR. RICHARDS: Outside of seismic and cask drop and I guess

1 you can talk some of the siphoning events but --

2 MS. HENDRICKS: The seismic and the cask drop both have that
3 as a factor it would appear.

4 MR. RICHARDS: No, I think seismic and cask drop say you
5 basically -- the assumption is you drain the pool instantaneously and
6 you don't put water back in --

7 MS. HENDRICKS: But the risk of that is tiny.

8 MR. RICHARDS: We don't have seven days. You --

9 MR. BRADLEY: But we also heard that part or at least over
10 half of the seismic risk was coming from the equipment and not the pool,
11 so I mean there is a factor there too of long-term uncover.

12 MR. RICHARDS: Yes, that's right. You are right. There is
13 a portion of the seismic that falls into that category.

14 MS. HENDRICKS: And I presume the cask drop -- we didn't get
15 all the way through the sequence but I presume not every aspect is
16 catastrophic, if you will, for the cask drop, that you have other damage
17 levels too, just like you would for seismic.

18 MR. BARRETT: I think it is very possible that when we get
19 right down to it a lot of these scenarios will drop off the screen, when
20 we get information back from you and from other stakeholders that give
21 us a sense of where the plants are, how they actually operate and how
22 they will operate in the future.

23 We weren't able to get there in two months. That is a level
24 of detail that, as Stu said, we just -- we had to make a trade-off
25 between level of detail and specificity versus getting something out in
a reasonable amount of time that can begin a dialogue with you and with
others, and we have made those choices, and as you know in the past the
NRC would have taken a lot longer. We would have come to something that
was much closer to a final result, and we probably would have been a
little bit more set in the sand as to how much flexibility we had to

1 move from there.

2 We are trying to do business differently now, and this is
3 part of it, that you are going to see information that hasn't had the
4 full kind of study that the NRC used to try to do, so we are very
5 interested in seeing that feedback, but always in the background keep in
6 mind these are very, very low numbers that we are calculating here --
7 1.19 percent of 10 to the minus 5 is twice in a million years. That is
8 pretty low.

9 MR. RICHARDS: Other comments or questions?

10 MR. DUDLEY: Ray, do you have any comments or questions?

11 MR. SHADIS: I was just in a stir here now. Would it be of
12 help to the process if the working group had up-to-date design
13 information on all the plants which are undergoing decommissioning?
14 That's sort of rhetorical.

15 It is one of the criticisms that GAO levelled about the
16 whole risk-informed process at NRC is that many plants do not have
17 up-to-date design information available. Their FSARs are incomplete,
18 whatever it may be, and it seems that the seven-day thing has almost a
19 biblical tone to it -- recovery in seven days.

20 If you have an earthquake that is large enough to damage the
21 spent fuel pool, I think we have to understand that the infrastructure
22 in the host community is also likely to be severely damaged, that
23 emergency equipment simply may not be available. If it is large enough
24 in the case of Maine Yankee, for example, if it is large enough to
25 damage the spent fuel pool, it will be large enough to collapse the
spent fuel pool building, the end walls of which are not seismically
qualified. They are masonry walls.

Then you may well have a curtain of masonry lying on top of
the fuel. There's so many factors that play into this that relate
directly to the siting of the plant and to its design, and I want to

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1 point out that the industry folks really should be contributing I think
2 at this stage, but one of the things that you really to have in hand is
3 that plant-specific design information so that there won't be surprises.

4 Mr. Kelly observed that you have a single bus handling this
5 spent fuel system. That should have been on an application, on a piece
6 of paper in front of you.

7 One of the problems that has brought us to this procedure is
8 that plants undergoing decommissioning have to approach all of these
9 issues piecemeal with applications for amendments and exemptions and so
10 on. It seems like the right thing would be a single application, but it
11 really should have all of this information to meet a standard set of
12 criteria for a decommissioning plant.

13 You know, that is my observation to date. I would like to
14 make a speech later on.

15 MR. RICHARDS: All right. Well, I think we agree with you
16 that we hope to go to a process where plants can perhaps make a single
17 application to go through decommissioning because we'll lay out rules
18 that will say what is required instead of dealing with these changes on
19 an exemption basis. It would be nice to have it all laid out ahead of
20 time in 10 CFR and then licensees would know what they had to do exactly
21 and simply implement those changes and be done.

22 That is part of why we are going through this process, Ray,
23 is to try and get there.

24 As far as design basis goes I can't speak for the technical
25 working group but I would think that for decommissioning plants that
certainly design basis, the construction of the spent fuel pool and then
the recent changes they have made are probably readily available. I
mean you are talking about obtaining the design basis for a very small
& fraction of that total plant that was built, so on a plant by plant
basis I don't imagine that is going to be a problem where we are dealing

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1 with plants individually.

2 What we are trying to do is craft a set of regulations that
3 envelopes all the possible scenarios without having to go out and
4 analyze each one, one at a time.

5 MR. SHADIS: Well, I know, but we heard some specifics here
6 being tossed back and forth, issues about siphoning, for example. If
7 you look in the ISAT, 1997 ISAT report on Maine Yankee, you will see
8 that there was a temporary rig where there was not a lock to prevent
9 siphoning on that pool, so you want to look back to that.

10 If you have issues of the configuration of the fuel being
11 directly related to the number of days you have available for a zirc
12 fire window, and I forget which NUREG number it was, but it mainly had
13 to do with the size of the orifice of the cooling channel up to the
14 center of the fuel, stretched it by a factor of two, I think, as you
15 reduced the size of that orifice -- then you, to my mind you bring in
16 foreign materials exclusion issues.

17 If you have a tarpaulin or plastic heating of something go
18 into the spent fuel pool, maybe even by the same event whereby you have
19 challenged the integrity of the pool, be it the transfer tunnel or
20 whatever, and you have blockage on the bottom of one of those racks,
21 then you have a column of steam and water bubbles, whatever it may be,
22 coming off that rack. You have radiological problems. If I were a
23 fireman, I wouldn't want to go near it with a fire hose, so, you know, I
24 think a lot of those issues really need to be brought in, and a lot of
25 them would surface I think if that design information were accurate and
it were up-to-date, if those administrative procedures were all in one
place.

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I think in the future this really ought to be the shape of
the PSDAR. It really should be more than the trivial outline that it is
at this point.

1 MS. ORDAZ: Thank you for the comment. We appreciate the
2 comment and we will take that into consideration during independent
3 review process.

4 MR. SHADIS: Thank you.

5 MR. DUDLEY: Are there any more public questions or
6 comments? Yes, Mr. Atherton?

7 MR. ATHERTON: I have quite a list.

8 MR. DUDLEY: If the questions are regarding the
9 presentations you have heard, we would love to have them now. If they
10 are not regarding the presentations now, if you could reserve that to
11 the public comments session at the end of the meeting.

12 MR. ATHERTON: My name is Peter James Atherton. I have a
13 number of comments which include what has been discussed, but also
14 covers what I haven't heard yet and I suspect that you might cover that.

15 MR. DUDLEY: Why don't you go ahead with the comments
16 regarding what you have heard.

17 MR. ATHERTON: Well, I am here, I guess, I am one of the few
18 people who has been involved with nuclear power plant sites, and I have
19 represented the interests of the people in and around the nuclear power
20 plants at a number of different locations.

21 It has come to my attention that, especially with some of
22 the earlier plants which were built in the '50s and '60s and are now
23 decommissioned or going through the process, that there was specific
24 seismic requirement that I was able to locate in the safety analysis
25 reports in the public document rooms locally which identified the basis
for a seismic design of a spent fuel pool. And I, therefore, have a
general basic question as to what is the design criteria that is being
applied, generally speaking, across the board, not just seismic, to
spent fuel pools.

The first operating reactor was proposed roughly in 1955 for

1 commercial generation of electricity, which is 44 years ago, and here we
2 are 44 years later identifying problems which haven't been addressed or
3 considered during this interim. I have some difficulty with that. Are
4 we now just realizing that these have been problems that are, for all
5 practical purposes, realized for the first time? Or is it only because
6 more and more plants are being decommissioned that we have an
7 inclination to look more rigidly at the way things exist today?

8 MR. RICHARDS: Peter, before you go on, if I could get a
9 little clarification on those comments. Of course, has time has gone by
10 -- you asked what is the criteria applied to the construction of spent
11 fuel pools. That has evolved over time. You know, obviously, the
12 standards that were applied to the construction of a plant in, you know,
13 1965 is not the same as that that was applied to a plant in 1985. As
14 issues have come up, I think they have been addressed by and large. I
15 can't speak exactly to what you are talking without more specifics.
16 But, for instance, I know the agency undertook the SEP program, oh,
17 probably a decade or more ago, the purpose of which was to go back and
18 look at plants that had been built early on and to address the seismic
19 issue.

20 For instance, San Onofre, Unit 1, was a fairly early plant,
21 was looked at from the seismic perspective. I think the agency was
22 expecting them to make some fairly significant seismic upgrades and, as
23 a result, they elected to shut the plant down rather than make the
24 investment.

25 So I will grant you that the criteria has changed. I don't
know of any plants that have a problem today based on your comments. So
unless you can give us specifics on the name of a plant you are
concerned about, I don't think I can answer your question.

MR. ATHERTON: Let me rephrase it. Without getting into the
naming of specific plants that perhaps I would have a concern with, what

1 are the standards? It appears to me that you are -- if I could make a
2 comment based upon what you said. It appears to me that you are in the
3 process of developing standards at this time which to apply
4 retroactively to spent fuel pools. Is that what you are attempting to
5 do from an overall perspective?

6 MR. RICHARDS: No, I don't think so. If you are saying we
7 have been making errors all along and now we are trying to correct them,
8 that is not my perspective. What we have been doing is dealing with
9 plants on a case by case basis. When they have gone into the
10 decommissioning mode, we have asked plants to look at the potential for
11 a zirc fire, to develop -- you know, most plants are seeking to truncate
12 their emergency planning based on being able to say a zirc fire can
13 occur regardless of how small the probability is. We are trying to get
14 into a position where we don't have to deal with that on an individual
15 plant by plant basis because it takes so much resources.

16 So the intent was to see if we could step back, identify in
17 an integrated fashion the risks associated with decommissioning and put
18 together a set of regulations that capture all plants who would enter
19 decommissioning and streamline the process. I think it has been said a
20 number of times today that they made a number of assumptions on a
21 plant-specific basis may -- you know, utilize or would -- on a
22 plant-specific basis you may come out with a more conservative answer.
23 But for the purposes of us trying to envelope the entire industry, we
24 had to assume something else.

25 So, do you understand where we are trying to head here, what
the purpose of our effort is?

MR. ATHERTON: I have been trying. Let me -- perhaps I
should continue with --

MR. RICHARDS: Well, I want to nail you down a little bit
because I want to be responsive to your comments, but I can't do that if

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1 they are very -- very, very broad.

2 MR. KELLY: This is Glenn Kelly from the staff. I know of
3 the four plants that I went out to, one of them did not have a seismic
4 Category 1 spent fuel pool, but that fuel had also been in that pool for
5 many, many, many, many years, to the point where they don't even need a
6 heat exchanger to remove heat. It just -- losses to ambient are more
7 than enough to keep the pool cool.

8 At that plant if you were to drain all the water out, the
9 pool -- the fuel would almost care less. It is not going to heat up to
10 the point that you are going to get a fire. And if you don't get any
11 fire, you are not going to have any off-site consequences.

12 So whether or not a seismic event ever affected that pool,
13 at that is point it would have no impact on public health and safety. I
14 am not aware of --

15 MR. ATHERTON: Could I ask you a question?

16 MR. KELLY: Sure.

17 MR. ATHERTON: Are you considering only the possibility of a
18 fire -- what is it, a zirc fire?

19 MR. KELLY: That's correct.

20 MR. ATHERTON: That would release sufficient radioactivity
21 to adversely affect the public?

22 MR. KELLY: That's correct. And from my standpoint as a
23 risk analyst, I am worried about something that would be -- I am not
24 worried about a design basis, you know, 1 rem at the boundary, that is a
25 "no, never mind" in risk space.

MR. ATHERTON: Well, what about the criticality problem?

MR. KELLY: Criticality, again, at this plant would not be a
problem and, in general, when we have looked at the criticality, and we
are not done looking at it, but it doesn't appear to be --

MR. ATHERTON: You haven't spoken to that. That is a new

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1 issue, I didn't want to bring it up at this time.

2 MR. KELLY: Well, it is something that we have -- it is in
3 our report and we are looking at that. It does appear to be a real
4 problem for us, but it is something that we are continuing to look at,
5 to confirm that that is not a problem.

6 MR. ATHERTON: Then I assume you are going to talk about
7 that later this afternoon?

8 MR. KELLY: From a risk standpoint, we don't consider it to
9 be a problem. And the reason is -- and I will speak from my thinking
10 about that, if you have -- if you were able to create a small critical
11 mass within the pool, as long as it was coolable geometry, all you have
12 to do is keep some water on it, and it is going to, at worst, just heat
13 that water up and bubble it away.

14 MR. ATHERTON: Now, you are assuming the pool is covered,
15 though, when this happens? You have water in the pool.

16 MR. RICHARDS: If there is water, there is no zirc fire,
17 there is no change in the configuration.

18 MR. KELLY: Right. Well, I could get a change in
19 configuration from a large seismic event that might -- potentially might
20 affect the configuration and could cause me some criticality problems.
21 I might be able to get -- there may be a range where I could get a point
22 where I could shake the assemblies enough that I could knock out the
23 burl and other things and knock the pellets loose and put them on the
24 floor of the pool and maybe get something, go critical then.

25 MR. ATHERTON: What about a collapse of the racks that hold
the spent fuel together, are you considering that possibility?

MR. KELLY: Right. I am saying it is possible that I might
have a large enough earthquake, beyond design basis earthquake, that
could create something like that.

MR. ATHERTON: But if there are a number of plants which do

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1 not have seismic criteria for the spent fuel pools, how do you --

2 MR. KELLY: The racks are still seismic.

3 MR. BARRETT: If I could add a word about this, --

4 MR. KELLY: And the pool -- and you are not going to get a
5 fire.

6 MR. ATHERTON: Say that again, please.

7 MR. KELLY: The racks are still seismic.

8 MR. ATHERTON: The racks are seismically attached or
9 fastened to a non-seismic spent fuel pool, is that what you are telling
10 me?

11 MR. KELLY: That is what Diane was just telling me, that the
12 racks themselves were that way. But maybe George has some more details
13 about that.

14 MR. HUBBARD: I will refer you to a couple of studies that
15 -- I say recently done, actually, as I think about them, they are about
16 three years ago. The staff undertook a --

17 MR. ATHERTON: Who am I speaking to?

18 MR. HUBBARD: George Hubbard with the Plant Systems Branch.
19 In July 26 of 1996, I believe it was, the staff submitted to the
20 Commission a report, it was the results of a task action plan that we
21 did looking at spent fuel pools, looking at them from the cooling
22 aspect. I believe we also looked at seismic. And as we identified some
23 plants that had some concerns, we went back and looked at those plants
24 and determined that we could not justify any additional -- any backfits
25 on them.

As part of this, I am not aware of any plant that you are
talking about being a non-seismic pool. I am not aware of any plants,
the operating plants that have a non-seismic pool. Some of the cooling
systems may be non-seismic, but the pools themselves, and I believe the
racks also, have been considered for seismic design.

1 MR. ATHERTON: Well, when you consider -- I go back to 1978,
2 if I may go back that far, for one purpose. In 1978, at Maine Yankee,
3 the staff, NRC staff, and this was after I left, the staff determined
4 that a hydrogen explosion in the turbine building would collapse the
5 turbine building. And the staff left that in the middle of the report
6 and never elaborated upon it thereafter from what I have been able to
7 find out.

8 Likewise, when you say the pool is seismically designed, Mr.
9 Shadis raised the concern that what about the components surrounding the
10 pool, the walls, the roof, and other equipment that might be in the
11 general area, what effect is that going to have in the event of a
12 seismic -- a significant seismic event?

13 MR. MEISNER: Well, since that has been raised twice, I am
14 going to have to answer it. That has long since been analyzed,
15 particularly what Ray discussed about the cinder block wall falling down
16 on top of the pool, layering on top of the pool, that was analyzed from
17 a cooling point of view, I think ten years ago as part of our license
18 basis.

19 MS. JACKSON: From a generic standpoint, we are hoping to
20 cover that in our deterministic analyses as well, try to make those
21 bounding or near-bounding. And although it is unrealistic and we have
22 been criticized for it, one of the calculations we did was based on
23 adiabatic heatup. Now, even if you have the roof of your spent fuel
24 building on top of your spent fuel pool, you will still have more
25 cooling than an adiabatic heatup, so that is an overly conservative
calculation we did to try and bound things and to give us a measure of
how much time would you have to take protective measures if you didn't
have off-site emergency preparedness. It is things like that we tried
to capture, not in every case, because in a probabilistic arena it
wouldn't be appropriate, but perhaps in the deterministic arena, we

1 would try and capture that.

2 As far as the criticality is concerned, if you have to lose
3 your water -- if you have water in your spent fuel pool, especially the
4 PWRs, there is soluble boron in them, so you have to loose all your
5 water and refill it with raw water and have damage to your fuel or your
6 rack to have a criticality problem. If you have some water left in,
7 perhaps it is boil-off, you are getting a larger concentration of boron
8 left, so if you add more clean water, you still have boron, you won't
9 have a criticality problem. If you lose all your water and they are
10 just exposed, you don't have a moderator to be able to go critical, so
11 you wouldn't have a criticality problem.

12 MR. ATHERTON: You are assuming the fuel rods remain intact?

13 MS. JACKSON: Right. We are going to that. But, yes, so
14 far, yes, remained intact. If we reflood with pure water after losing
15 all of our water, but all pure water back in the fuel -- the fuel is
16 intact, it still wouldn't because it is a criteria, the rack itself, to
17 maintain K effective below 1. You would have to get some damage to your
18 racks, to your fuel, and be in a configuration that you can say the
19 boron that is existing in the plates themselves aren't there to help you
20 with criticality dampening. We are still looking at that type of stuff.

21 MS. ORDAZ: Yes, we still have further work to do on the
22 criticality portion before our report comes out in August.

23 MR. ATHERTON: Since we are in that subject, what techniques
24 are you using? Are you using -- what computer codes are you using to
25 determine your criticality problem?

MR. KOPP: I am Larry Kopp, NRR. We are not doing any
calculations, we are looking at it just from a physics standpoint. You
don't have criticality concerns if you don't have water in the pool,
because your fuel is limited to 5 -- 8 percent enrichment and you
cannot, even for an infinite mass, go critical without water at that

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1 enrichment or less.

2 If you destroy the fuel or somehow deform it and reflood
3 with pure water, you may have some criticality concerns then.

4 MR. ATHERTON: Well, in operating reactors, we used to be
5 concerned with fuel meltdown when it was exposed and there wasn't a
6 cooling medium there.

7 MR. KOPP: That is a radiation problem, not --

8 MR. ATHERTON: How does this affect -- well, I am getting
9 there. How does this affect the scenario that you described in the
10 spent fuel pool?

11 MR. KOPP: Where you can get to the TMI type scenario, is
12 that what you are talking about, where you can lose the pellets from the
13 cladding somehow, and if you assume they form some type of critical
14 configuration at the bottom of the pool, yes, there you can have a
15 criticality concern then. The scenario is pretty far-fetched, though.
16 For all the pellets to get out, first of all, to get out of the cladding
17 and form on the bottom of the pool into a critical configuration, have
18 enough moderation, it is --

19 MR. ATHERTON: Well, we are talking about worst case
20 scenario, the collapse of a seismic event, the collapse of some --

21 MR. KOPP: Well, that is one of the scenarios that we are
22 mentioning in the -- as far as being able to calculate it, we will have
23 to --

24 MR. ATHERTON: Well, I just -- I am raising the concern as a
25 member of the public because radiation release in a building that is not
contained, that is, it does not have the equivalent of a reactor
building or a reactor vessel's containment, has the potential for
releasing this to the public should this worst case situation evolve
somehow. And because you don't have the equivalent of the
defense-in-depth that you had with reactor systems inside a containment

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1 within the spent fuel pool area, it would seem to me you would want to
2 look into these in some greater detail because of the potential severity
3 of the release to the environment.

4 MR. KOPP: Damaging the fuel and releasing the pellets
5 outside the cladding would cause you a radiation concern right then and
6 there without even considering a criticality event.

7 MR. ATHERTON: You are looking into this?

8 MS. ORDAZ: Yes, Mr. Atherton. We still have some work to
9 do in criticality and we are looking at this -- or we will take your
10 comment --

11 MR. ATHERTON: I didn't mean to divert to that before he had
12 a chance to talk about it.

13 MS. JACKSON: Larry is doing the criticality part. What you
14 are now talking of is dose consequences to radiation protection.

15 MR. ATHERTON: That is ultimately what I am concerned about
16 for my constituents.

17 MS. JACKSON: And that would be the next step beyond the
18 criticality question.

19 MR. ATHERTON: Okay -- and that is something you are going
20 to look into though?

21 MS. ORDAZ: Yes.

22 MR. ATHERTON: I raised this issue at the last meeting, last
23 month, concerning the aging and the equipment qualification. What
24 effect has the fact that some of these spent fuel pools are quite
25 ancient, and I know for a fact that at least one of them is leaking,
what effect does this have upon the determination that the equipment was
designed seismically, if such was the case, back in the design phase of
the building, and then 20, 30, 40 years later we find out that it is
failing in a manner in which we did not consider it would fail in,
probably because we didn't anticipate the use of the spent fuel pool as

1 a quasi-permanent storage center because of the lack of anyplace else to
2 put it. That is phase one.

3 The second phase is there are a number --

4 MR. ZWOLINSKI: Well, Mr. Atherton, you have just said we
5 have got a spent fuel pool out there that is leaking. Could you
6 identify that to us so that we might be able to look into that matter?
7 We take that issue very seriously. I am certainly not aware of pools
8 leaking in this country.

9 MR. ATHERTON: The spent fuel pool that I know of has
10 segments. It is divided into various segments in which it keeps its
11 damaged fuel, its defective fuel, its spent fuel, et cetera, et cetera.

12 It has lowered the water level in order to minimize the
13 leaks and then put some sort of a steel covering over it in order to
14 minimize the radiation hazard to the people who have to go into the
15 area.

16 I was surprised to hear about this, and I am even more
17 surprised that you don't know about it. I am not intending to put any
18 one plant on the spot here. I am trying to address problems generically
19 and I am reluctant to --

20 MR. RICHARDS: Well, Mr. Atherton, we are aware that there
21 are a couple of plants out there that have what we would consider to be
22 relatively minor leaks, and there are various ways to get that beyond
23 the spent fuel pool itself failing. I think that is the way you
24 characterized it.

25 MR. ATHERTON: It went to the fact that the spent fuel pool
had degraded to the point where at least in this one instance they
weren't able to identify the leak as to where it was actually leaking
from, and they were experimenting with the fuel pool level, water level,
in order to try to minimize it.

However, in just about every design basis that I considered,

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1 the spent fuel pool was not intended to be designed so that it would
2 leak.

3 MR. RICHARDS: Well, let me respond to your question if I
4 could --

5 MR. ATHERTON: Let me finish. The pool was not designed to
6 be a leaker, and some of them it appears have turned out to be leakers
7 and therefore my concern would be what effect does aging have upon the
8 qualification of the barriers in the spent fuel pool? That would be
9 something that would affect I think deterministically if not
10 probabilistically, how you would look at long-term fuel storage at this
11 particular or any particular site.

12 MR. RICHARDS: All right. The leakers that I am familiar
13 with appear to be that you get a leak in a weld along the liner. These
14 pools are typically concrete and rebar for the most part, but you put a
15 liner on the inside and then I know most plants have a leak detection
16 system that goes along the welds of the liner so that if you do develop
17 a pinhole leak in a weld that may not have been the quality you hoped
18 for on the front-end, it shows up in the leak detection system, maybe
19 not, but my understanding is that the leaks that have occurred have been
20 very small, probably due to the liner. It does not affect the basic
21 integrity of the steel or the concrete involved in maintaining the
22 overall integrity of the pool, so in the bigger scheme of things as far
23 as I know we don't have a problem out there.

24 If you are talking about having a pool that should not have
25 leaked at some very, very small rate -- yes, that might be the case but
I don't think that presents really a radiological hazard of any
magnitude at all.

MR. ATHERTON: In the event of a large earthquake, what
effect would the fact that you have a leak at this point and possible
degradation of the liner and/or the concrete barriers, what effect would

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1 that have upon your assumption that from a probabilistic perspective
2 that it is rugged enough to withstand three times the safe shutdown
3 earthquake criterion?

4 MR. RICHARDS: I don't think it would have any at all if it
5 is just a weld defect -- as far as I know. I haven't heard of or I am
6 not aware of any significant degradation in any spent fuel pool as far
7 as the rebar, the concrete, and the basic liner goes.

8 MR. ATHERTON: Especially for operating plants.

9 MR. BAGCHI: Can I address that?

10 MR. RICHARDS: Sure.

11 MR. BAGCHI: My name is Goutam Bagchi. I am with the
12 Division of Engineering.

13 The pool liner is anchored to the concrete itself. Leakages
14 due to some defect in the weld or eventual expansion-contraction causing
15 some cracking in the weld may cause some minor leak, but it does not
16 affect the structural integrity and even in an earthquake, a very large
17 earthquake, the structure is much more rugged than just the simple
18 design would call for.

19 These structures have very large walls, very thick slabs as
20 well, and there is no aging effect, determinable aging effect that could
21 affect the fragility of the spent fuel pool structure itself to question
22 the integrity.

23 MR. ATHERTON: Is this generally speaking or for particular
24 instances that you have performed evaluations of or are you speaking
25 from general knowledge and experience? On what basis are you --

MR. BAGCHI: This is generally-speaking based on the
configuration and sizes of walls and slabs that we have reviewed.

I would like to emphasize that most of the operating plants
have gone through several cycles of review of the structure itself with
respect to upgrading their fuel pool racks, and these things have been

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1 reviewed every time this comes up.

2 You addressed the question of aging and I would like to
3 point out that as time goes on, concrete itself increases in progressive
4 strength and aging up to 60 or 70 years is not a concern.

5 MR. ATHERTON: On what are you basing this? Is this as a
6 result of mathematical calculation coupled with experience? An educated
7 guess or what?

8 MR. BAGCHI: I have done many evaluations myself, having
9 been a designer and also having been a reviewer based on actual
10 evaluation. I think I have looked at the Maine Yankee evaluation
11 myself.

12 MR. ATHERTON: The reason I am asking this, I used to work
13 for the Nuclear Regulatory Commission in the 1970s --

14 MR. BAGCHI: I know you did.

15 MR. ATHERTON: One of the criteria that the design
16 requirements considered was the fact that a reactor vessel for instance
17 and its permanently installed internals were designed to last 40 years.

18 Now we have seen in both some PWRs at least around the
19 control rod drives and in some BWRs around the core shroud area and the
20 spray spargers and the rings, et cetera, we have seen some degradation
21 to the point where they were concerned about failure and at least in
22 some instances there were attempting to patch if not overseas replace
23 some of these parts altogether --

24 MR. BAGCHI: Can I address the aging question? Those are
25 active components. They are subject to flow-induced degradation and
these are passive components. We are doing license renewal reviews.
Industry has prepared a significant amount of information with respect
to aging of passive structures. These were called industry reports and
research information has been gathered on the behavior of passive
components.

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1 We also have the maintenance rule and we have not found
2 significant degradation of any sort in passive structures.

3 MR. ATHERTON: What about the racks in the spent fuel pool?

4 MR. BAGCHI: You were talking about the integrity of the
5 spent fuel pool itself. Now you are talking about the racks. The racks
6 have been evaluated for the seismic basis that they have to operate
7 under and beyond design basis events there could be some failures, minor
8 failures.

9 MR. ATHERTON: I am talking about the degradation --

10 MR. RICHARDS: Mr. Atherton?

11 MR. ATHERTON: Sir? Am I taking up too much time?

12 MR. RICHARDS: Well, we value your comments and we have a
13 period this afternoon for public comment at 2:30 to 3:30. We are
14 closing in on lunch.

15 If you have a specific question that we can cover quickly
16 for the group, that would be fine, but I think we are getting into kind
17 of a very general area here of the maintenance rule and degradation of
18 plants.

19 In order to keep us on schedule here, I think we need to
20 move on.

21 MR. BAGCHI: I just want to add one final point. The racks
22 are made out of stainless steel and far less subject to degradation than
23 anything else. These are passible.

24 MR. ATHERTON: The core shroud on a BWR is made of stainless
25 steel also. I just wanted to raise the fact that I am concerned because
I have encountered problems with both stainless steel and other
components in operating plants and I am carrying it over to the spent
fuel pool to see what you are doing in that arena.

 MR. RICHARDS: Mr. Atherton, could I ask that you -- we'll
cover your additional comments at 2:30 this afternoon, if that is all

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1 right, because I think it is time for us to take a lunch break.

2 MR. DUDLEY: Do you want to get Bill because Bill has a
3 short talk?

4 MR. RICHARDS: Well, what is the consensus here? Do you
5 guys want to do Bill Huffman's talk --

6 MR. MEISNER: Stu, we don't have a presentation.

7 MR. RICHARDS: Oh, you don't? All right.

8 MR. MEISNER: If you want to use that time. I think we will
9 have some remarks but --

10 MR. ZWOLINSKI: Let Bill give it.

11 MR. RICHARDS: Yes, all right. Why don't we go ahead and do
12 Bill Huffman's presentation and then we will see where we are at.

13 Mr. Atherton, we appreciate your comments, but we can
14 continue the dialogue at 2:30. We appreciate that.

15 MR. ATHERTON: Thank you, sir.

16 MR. HUFFMAN: Almost good afternoon, everyone. My name is
17 Bill Huffman, and I am in Decommissioning Projects. And we are
18 concerned with implementation, the process side of this whole equation
19 and our charter was -- What can we do to improve the decommissioning
20 regulatory process?

21 As probably the industry is well aware of, there have been
22 several rulemakings that have been struggling for a number of years,
23 emergency planning, financial protection. And based on what we have
24 seen so far in the staff's technical assessments, they will probably
25 need to be changed again. And so we are saying to ourselves, there is a
need to step back and do this whole thing in a holistic, integrated way,
so we are not wasting manpower coming up with rulemakings that go
through the process, go out for public comment, and then have to be
changed again. So we want a finalized understanding of what the risks
are and what we need to do to make this thing a streamlined process.

1 So as was hinted at -- or, actually, more than hinted at,
2 this was described in an earlier presentation, we are going to take
3 emergency planning, financial protection, safeguards and operator
4 staffing and training and hold off on those rulemakings until we have a
5 good understanding of risks from a spent fuel pool, and integrate that
6 understanding criteria that is developed into a single rulemaking
7 package, and push that through with a fairly high priority once we have
8 that understanding and we are pretty confident that it is not going to
9 change.

10 But until that understanding is reached, I think it would be
11 a mistake to go forward and try to second guess what the technical staff
12 is going to arrive at. Just like we have been discussing today, it is
13 still very early, very preliminary and we haven't reached the point
14 where we are thinking about ultimate criteria.

15 Well, be that as it may, what else can we do to keep the
16 process moving along? And we recognize there are some regulations that
17 of great interest to the industry that we are probably going to be
18 putting a hold on. But is there something else we can do that is big
19 picture? And what our group has determined, and I pretty much went over
20 this the last time we met, was that we would prefer to consolidate all
21 the decommissioning regulations into its own dedicated part within CFR.

22 And several reasons why we think this is a worthwhile
23 effort. Number 1, it will only contain regulations applicable to
24 decommissioning, and so it will clearly segregate and be separate from
25 any of the operating plant regulations that tend to get confused in this
Part 50 license arena that remains even after the plant has ceased
operation. It will eliminate uncertainties as to what rules no longer
apply to decommissioning.

 More importantly, I think the process of doing this will
help identify decommissioning regulatory problems and policy issues, one

1 that are there are in the background that maybe we haven't fully come to
2 grips with yet, and it will also help us identify other regulations that
3 are amenable to risk-informing. We have singled out four, but certainly
4 there may be others as well.

5 And, lastly, but probably least, is that continuing the way
6 we have been doing business, of amending rules in 10 CFR Part 50, is
7 always a concern to operating plants, too, because of the way that we
8 make those amendments and we tend to make exception to operating plant
9 amendments, and this would be a much cleaner way of dealing with any
10 future licensing amendments.

11 So what we have done is we have devised a plan, a phased
12 approach, and the first phase would be performing a detailed review of
13 10 CFR, not just 10 CFR 50, but other parts, other 10 CFR regs as well,
14 and bin them into the appropriate categories.

15 And this is going to be the meat and potatoes of this whole
16 thing is to make sure we come to grips early on with what the basis for
17 these regulations are, what is the intent, and where we lack definition
18 in decommissioning space. Particularly Bins 3 and 4, regulations that
19 have indeterminate applicability to decommissioning of nuclear power
20 plants.

21 I can site where there seems to be some confusion and that
22 would be 10 CFR 26 on fitness for duty. I know that we have staff
23 position that has gone out, lower level staff position that said it
24 doesn't apply. We have other Statements of Consideration in the 1996
25 rulemaking for decommissioning that says we will assume it does apply
until further decisions are made. So we have to look at these and
others and determine ultimately, are they or are they not applicable?

Bin 4 recognizes the state of regulations as they are now,
that there are a lot of partially applicable rules, or rules that change
with time, with decay heat loads, and these are some areas that are

1 going to present a challenge when we write our decommissioning rules.

2 After we get through doing that first phase, then we will
3 work on constructing a model, looking at something similar to what we
4 did with license renewal. And then Phase 3 is where we get into the
5 standard rulemaking process. We will put together what we have learned,
6 the model we have got and submit a rulemaking plan to the Commission for
7 approval. And we expect that this rulemaking plan will identify
8 additional policy and regulatory problems and hopefully contain
9 regulatory solutions.

10 And when we get to this point, we will have to have a pretty
11 clear understanding of what the detailed resources and schedules are for
12 completing this kind of thing. We don't anticipate it is going to be a
13 minor effort if there is a lot of regulatory decisions that have to be
14 made.

15 The final phase of this would be, in an effort to include
16 the public and industry stakeholders early on, is we would, with the
17 Commission's approval, put this out as an ANPR to make sure we do have
18 buy-in from the public that this is the way to go. And even before the
19 ANPR phase, as we are meeting today, we would continue to solicit and
20 work with the industry and the public in terms of letting them know
21 where we are and how we are progressing, what kind of problems we are
22 encountering along the way.

23 But once we get into the normal rulemaking phase of this
24 process, then it would proceed according to all of the rules NRC has for
25 rulemaking.

So just to repeat some of the motherhood things, is that we
think that this is important. There has been a lot of problems in
decommissioning. We are thinking that this is the way to go, to start
with a clean sheet and to reinvent decommissioning to enhance clarity,
efficiency and effectiveness, while maintaining safety, and to improve

1 public confidence.

2 Two things that we are looking at in particular is the
3 integration of those four rulemaking areas, which will we will hold off
4 on until we get a better picture on the technical side, and the
5 consolidation effort, we look to move forward with, assuming we get
6 management approval. That is about it.

7 MR. DUDLEY: Are there any questions for Mr. Huffman?

8 MR. RICHARDS: I would like to note that this is all
9 preliminary thinking. We haven't got the NRR management chain of
10 command's okay on this, much less the Commission, but this is our early
11 thinking on it.

12 MR. DUDLEY: Oh, yes.

13 MR. LAGGART: My name is Mike Laggart from Oyster Creek and
14 regulatory stability is what I am looking for in decommissioning in the
15 next couple of years. And from what I am seeing in the areas of
16 safeguard and training, and previous exemptions issued, I have no
17 guidebook at all. No previous exemption requests are valid any longer,
18 or any positions by the staff. You mentioned the fitness for duty rule,
19 that is up in the air as well.

20 I can't wait three -- possibly three years when all the
21 rules come out, all the regulations come out. I am in a quandary as to
22 what the guidance is going to be, or how closely I can work with the
23 staff in the next couple of years. And I am assuming other plants are
24 going to be in that position, too. We have enough time for planning,
25 but I am left in a position where I can't plan anything. I guess I am
searching for the guidance in the short-term, the next couple of years,
two to three years.

MR. RICHARDS: I think what we are going to do is we are
going to continue to build on the experience we have got before. You
should be looking at what has been approved in the past on a case by

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1 case basis, and unless there is something significantly new that has
2 come along, we will probably be looking for the same kind of submittals
3 from you.

4 MR. MEISNER: Just to follow up on that, Stu, I think one of
5 the problems is there has never been any consistency in the past, that
6 every new licensee that comes up has something new added. You know, we
7 talk as if zirc fire has been applied to all decommissioning facilities.
8 You know, the history of this, it has only been applied to the last few.
9 And the ones before that, there were other criteria or inconsistent
10 criteria.

11 I was as surprised to hear about Part 26, gee whiz, you had
12 already put out a position on that. Are you going to take that now?

13 MR. RICHARDS: I don't think so, I think we will just group
14 them together.

15 MR. MEISNER: Why would that be indeterminate?

16 MR. HUFFMAN: Well, my study has shown that when you say we
17 put out a position, the staff, very -- fairly low level, issued a
18 position on it, I agree. However, --

19 MR. MEISNER: Are you saying we can't count on that?

20 MR. HUFFMAN: Well, I have found contradictory information
21 in the Statement of Considerations for the 1996 decommissioning rule.

22 MS. HENDRICKS: It was my understanding in the discussions
23 we had with the Commission that they were looking as an objective to
24 come up with an interim basis for some certainty and predictability.

25 MR. MEISNER: Right.

MS. HENDRICKS: Short of complete rulemaking. And I guess I
hear that objective sort of being taken off the table. That was the
question I had asked Mike before it was brought up by Mike.

MR. MEISNER: That is the fundamental problem with all this,
the staff can't take and hold a position. I guess we can talk about it

1 more after lunch time, but, you know, every time a decision seems to be
2 made in decommissioning, somebody pops up later and says we are going to
3 change it.

4 MR. HUFFMAN: No, I am not sure that says we are going to
5 change it, but if we find contradictory positions out there, I can't
6 ignore them.

7 MR. MEISNER: Of course you can. Someone makes a decision
8 because there is more than one possibility. Having made that decision,
9 established that staff position, of course there was contradictory
10 material before that, but you have established the position. Let's get
11 on with life. You can't change it, that is why we have things like the
12 backfit rule.

13 MR. RICHARDS: You know, we can have a discussion. I guess
14 we are going to have to go to lunch if you want to start talking about
15 the backfit rule.

16 MR. MEISNER: Yeah, it is probably the right time.

17 [Laughter.]

18 MR. RICHARDS: That is not on the agenda, we can put that
19 on. But one way to take care of business, Mike, to try and nail it
20 down, is to put it into a rule. Would you agree to that?

21 MR. MEISNER: Absolutely.

22 MR. RICHARDS: All right. So that is what we are trying to
23 do. But in order to have a rule, we have to have a basis. We turn to
24 the technical group for that basis. And that is the next step in the
25 process, we would like to do that as expeditiously as we can. We will
work with you to do that. And then when we have that basis, hopefully,
we will codify and then you and everybody else will be able to point to
it and say it is in the book, that's it. Right now we are not there.

Do you want to take a lunch break or do you want to plow on
here?

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1 MR. MEISNER: I am ready for lunch.

2 MR. RICHARDS: All right.

3 MR. DUDLEY: Let's all reconvene at 1:00 p.m. And for those
4 of you not knowledgeable with this building, there is a cafeteria on the
5 first floor. Thank you. See you at 1:00.

6 [Whereupon, at 12:00 p.m., the meeting was recessed, to
7 reconvene at 1:10 p.m., this same day.]

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

[1:10 p.m.]

MR. DUDLEY: Okay. If we could reconvene.

Next on the agenda is discussion by the Nuclear Energy Institute. Annette, will you lead that off, or Mike?

Mike Meisner.

MR. MEISNER: Okay. We didn't come prepared with a presentation. What we did come prepared to do was listen and then provide you with our feedback, and it's what we intend to do.

I'm going to talk fairly frankly, because it's really going to be difficult for me and the others to get across how disappointed we are in this process. I think there's been a real missed opportunity to do things right here.

When we look back at the Commission meeting that kicked all this off, in my mind the notion was the staff has done a lot of work already, and what we needed to do to risk-inform Part 50 is to bring some probabilistic insight to a lot of deterministic work that had already been done and package that together and send it to the Commission in June. I haven't asked yet, and we'll need to find out later, but I guess my impression is what goes to the Commission in June is largely a plan to work a plan, as opposed to any technical information.

I don't think that that's what the Commission is looking for. I think they were looking for a simple, straightforward way to risk-inform what we're doing here today. And instead I think you've developed a very elaborate process that is going to be years in the making. I don't really see any need for it, and I don't think the Commission will see any need for it, either.

I believe that it reflects a lack of discipline on the part of the staff in being able to go from A to B, to build on past

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1 information rather than do it all from scratch, and I think it has to do
2 with something we've seen consistently in decommissioning. Every step
3 of the way is an inability to hold a position. I mentioned earlier that
4 every single decommissioning plant that's come up for exemptions in
5 emergency planning or the like has faced a different staff position on
6 what's necessary to get those exemptions approved -- every single one,
7 save the last two, Maine Yankee and CY, who were kind of dealt with as a
8 pair. But those of you who know the history of this, and some of you
9 know it pretty intimately, know that there has never been a consistent
10 staff position, and that it changes all the time.

11 We thought NUREG-1353 was a pretty good document. It seemed
12 to address the range of issues and concerns associated with spent fuel
13 pools. In fact, what we provided you in a previous meeting was an
14 updated analysis, a la 1353, precisely because at the time that clearly
15 seemed to be the central issue.

16 Now if I've understood it correctly today, that information
17 has been put aside or that methodology has been put aside, and somehow
18 using the Laurence Livermore data, you all have come up with a risk
19 number that's about the same number as 1353. In other words, the
20 Laurence Livermore data made absolutely no improvement. At best it cut
21 it by half from 2 times 10 to the minus 6 to 1 times 10 to the minus 6.

22 The point is you again changed the process, you changed the
23 methodology, if I understood it, because I know darn well, based on the
24 work we did and provided to you, that seismic risk goes down nearly an
25 order of magnitude with Laurence Livermore data, and even more if you
use the EPRI hazard curves.

What we've heard this morning about how PRAs are done
conflicts with our understanding of how PRAs have been done in the past.
This 120 hours versus 24 hours thing is really mind-boggling. It seems
like to us the intent for doing it the way you did is to have something

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1 to deal with, because otherwise there wouldn't be anything there. We
2 see the same thing on the back end of this with NMSS and license
3 termination plans. They want to do a PRA with an end state of 31
4 millirem. I mean, my goodness, why even bother.

5 The industry needs some stability. That's why we're very
6 concerned with making it up as you go constantly, constantly changing
7 staff positions. You heard earlier from Oyster Creek, that you can't --
8 they don't know how to plan. You know, the things they heard here today
9 are different than they heard yesterday. We're even changing on the fly
10 staff positions on Part 26. The industry needs to be able to rely on
11 that in order to do decommissioning.

12 I guess to some degree we were disappointed about the site
13 visits that were conducted. I was listening real carefully as to what
14 input from the site visits went into the PRA model and which didn't, and
15 if I did my tally correctly, every single negative thing went into the
16 model, and not one positive thing did -- you know, credit for procedures
17 or design changes -- none of that went into the model, ensuring that
18 you've got a very, very conservative non-PRA model. That isn't how a
19 PRA is supposed to be done.

20 At the same time it seems like the staff has ignored
21 industry information -- like I mentioned, the seismic analyses that we
22 did with the 1353 methodology. We've got a pile of docketed
23 information, our FSARs, procedures from inspections, any number of
24 reports that we've docketed unique to decommissioning that don't seem to
25 have been touched. And when we talk about not having design information
for decommissioning facilities, it sure seems to me that a lot of that
information is there right on your desk. You want to know how the Maine
Yankee pool is designed and operated, it's in the FSAR.

I think we mentioned last meeting, if I remember right, that
Seabrook has done a PRA right on this issue. I haven't heard the staff

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1 mention that once. There they did it to the same end state I understand
2 you're doing it in this fuel uncovering. I also understand that when
3 you're going to take out the operating plant type of sequences that the
4 number comes in at 5 times 10^{-7} . It would seem to be at
5 least a worthwhile data point to use, but I haven't heard anything about
6 that being used.

7 And the way the discussions have been going this morning,
8 and we're practically begging you to get information, take information
9 from us, and use it to inform the process, and it feels like you're
10 resisting that, and I don't understand why. And overall I think the
11 staff did a singularly poor job in ferreting out information from us in
12 these plant visits associated with human error. Human error, if I
13 understood what was said this morning, is the sole driver of these
14 ungodly numbers that you're coming up with. And it's there because
15 you're not cutting off a sequence.

16 I think it's important that we get realistic. What would
17 happen if one of these facilities started draining down in the pool, it
18 went on for a day, two days, three days? Do you think that would
19 attract any attention? You know, we could look at TMI maybe as an
20 example, and the incredible resources that were thrown into that plant
21 right after the event.

22 Is the NRC going to sit here in Washington three days into a
23 draindown and not show any interest? Do you really think that a plant
24 would do the same? This is a simple operation out there. We can get
25 water into that pool any number of ways, and to even consider that we
have to worry about an event that's a week long, there's something
wrong. We've lost touch with reality.

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You've come up with numbers that show a risk comparable to
an operating reactor, 10^{-5} , that really doesn't meet the
straight-face test. These are very, very simple systems. Those of you

1 who have been out there know how simple they are. And to come up with
2 human error rates and failure rates enough to drive that number so high
3 as to be the same as an operating facility, there's got to be something
4 wrong, especially when you throw in the long recovery times available.

5 And one thing that is just a bit mind-boggling, if you look
6 at 1353 and the numbers, the risk numbers that they came up with for
7 seismic versus some of the other events like slow draindowns or airplane
8 crashes or the like, what it appears you've done is you've lowered the
9 seismic probability a little bit, and you've raised everything else an
10 order to two orders of magnitude in risk. I don't see how you can be
11 that far off from a study that was used to resolve safety issues in the
12 past and on which the NRC relied.

13 One thing, I know that in our last meeting that Gary Holahan
14 emphasized several times is that we can disposition issues
15 qualitatively, but I've not seen any tendency to do that. This 120
16 hours should surely be one that can be resolved qualitatively with a
17 realistic mind set. And there are others as well. Instead, it seems
18 like you've retained every adverse item you can in the model and avoided
19 making a decision on it.

20 There are several things we want to request of the staff.
21 First of all, that you set a ground rule for these issues going forward
22 to be consistent with the past. If a position's been taken in the past
23 and adapted, if a methodology's been used in the past, then follow it.
24 We don't need to reinvent the wheel from scratch here on every single
25 thing. You've got assumptions that are of concern to us. We see no
reason why you can't give us those assumptions tomorrow and start
working constructively with the industry and take our input and use that
in informing what you're doing. The assumptions seem to be critical to
the results, and we need to get it right.

I think you also need to, in addition to the very

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1 conservative calculations you're doing, also run another set of numbers
2 doing them like they should be done in PRA, best estimate. Make some
3 assumptions like the licensee will recover within a week and put some
4 water into the pool. Put those into your numbers. There's a broad
5 range of those things that if you considered I think you at least need
6 to calculate to show a comparison to the other numbers you're coming up
7 with. And I think that's only fair, and it's the appropriate thing to
8 do in PRA space. I know you're doing sensitivity studies, but why not
9 take a best-estimate approach as well and do the whole calculation and
10 see what it shows?

11 But most all we wish you would kind of get over this
12 seven-day hangup you have, because if we end up with that as a technical
13 basis for what you're doing, then it's not worth doing. It simply skews
14 the results unrealistically, and makes no sense.

15 So in summary, we need stability. We think the staff is
16 missing an opportunity here. We believe that the approach that's been
17 taken is not consistent with what the Commission had in mind. I've
18 recognized the need to be thorough and to cover all the bases, but there
19 are any number of different ways to do that to show that you've taken
20 certain things into account, and there are very many ways to
21 qualitatively resolve issues that don't need a year's worth of
22 calculation behind them.

23 So overall we don't agree with the staff's approach or
24 position on the work that's been done to date, but we really want to
25 provide whatever information you need to resolve the outstanding issues.
And I think you'll find us very responsive quickly and with good-quality
information, but what we have to know is what do you need. We'd like
you to give us your assumptions.

MR. RONE: At the risk of repeating some of the points that
Mike made, I would like to stress the theme of using extremely

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1 conservative assumptions on human error rate, and that is overall
2 contribution to risk.

3 I don't think it is reasonable and appropriate in the
4 absence of information about what operators would do or what the
5 utility's resources might be under certain accidents to assume the
6 worst. I think this underscores Mike's point about not assuming that in
7 seven days we wouldn't be able to recover some makeup source for the
8 pool.

9 Think about what was said. There is a five percent chance
10 that in a week with the nation notified that we wouldn't be able to find
11 some way of putting water into a fuel pool that is boiling. To me, that
12 is beyond what is credible. Even one percent, at least to me, is beyond
13 what is credible.

14 I think there is an absolute certainty that given a week
15 that with national resources committed, as they were in the aftermath of
16 the TMI accident you would find some way of adding water to the pool,
17 and so I would ask you please to go back and look at those conservative
18 assumptions. Let us help provide you input on what we would do under
19 certain of the scenarios for which there is a high human error rate that
20 is dominating the overall risk profile.

21 Having said all that, let me now talk about Oyster Creek
22 specifically. As you know, we have been trying to do the first plant to
23 do a good job prior to actually shutting down of preplanning for
24 decommissioning. Part of what we have been dealing with is the
25 regulatory uncertainty and we had looked to this initiative as a
near-term solution to provide us some guidance that we could use for the
basis of exemption requests and other submittals that we need to make.

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As I sit here, it looks to me like everything is back on the
table and I am not sure where we stand, what the interim Staff guidance
is going to be to us, as we march through this rulemaking process.

1 Our original schedule for our first round of exemption
2 requests was June, and then we moved that to the late summer and now to
3 the early fall. We are very quickly running out of margin in which to
4 slip our submittal schedule while this process works its way through,
5 and as we sit here, I don't know what we say, to be quite honest with
6 you.

7 I think that if you extract out the human error component
8 and use realistic assumptions, you would have the basis for concluding
9 that zirc fire is not credible and doing that on the near-term basis
10 rather than on a two-year basis.

11 MS. HENDRICKS: Just to summarize, I guess, remember what we
12 are trying to remedy here is lack of criteria, and going to what Art was
13 saying, over the years even without the latest upheaval, this has been
14 an incredibly resource-intensive process for licensees to go through --
15 the uncertainty, the lack of stability. Review requests are not easy to
16 process because the Staff has no criteria to use to process them.
17 Things that could be in a rather routine approval process end up sitting
18 around for quite a long time.

19 I do think there is an opportunity to come up with some
20 interim criteria that could be very pragmatic, using assumptions that
21 are reasonable, if necessary codifying the requirements or expectations
22 to see certain things in procedures and controls.

23 I really honestly think that is doable and I think that is
24 kind of what is really needed here, so I just hope that will be taken on
25 as the challenge, and just one point. Mike had mentioned that we are
seeing the same thing on the NMSS side. What he meant to say was dry
cask -- he said license termination -- dry cask is where we are seeing a
comparable what we view as an inability to do things like allow burnup
credit for fear of fission accident and transport, and when you look at
the numbers the risk of that accident really is just off the back of the

1 envelope calculation, 10 to the minus 13 to 10 to the minus 17, which
2 again gets you to the same theme we are thinking of here where your
3 ability to affect these risks with the additional requirements that you
4 may envision may not be there.

5 I mean you could have the requirements. For example, they
6 don't permit burnup credit. They have a fresh fuel assumption but in
7 reality permitting the burnup credit if you look at what the real risk
8 is of a criticality in an accident where you have to have a very severe
9 accident, you have to flood the cask and you have to have misloadings,
10 at least one or two and on and on.

11 You don't accomplish in the regulatory space what you
12 believe you are. In fact, you are misdirecting resources away from
13 areas where you could in fact have a real effect on safety, so that is
14 what Mike was referring to. I didn't want that to get confused,
15 especially since it is in the transcript.

16 We do very much appreciate the opportunity and we also
17 appreciate that you were somewhat under duress in coming forward with
18 what you did in the timeframe that you did it, and we hope you will take
19 our comments as constructive and as Mike and Art have said, reach out
20 and work with us and make the process hopefully a little more pragmatic.

21 MR. RICHARDS: We appreciate your constructive comments.
22 Responding to Mr. Meisner, I guess in looking through the notes, and I
23 tried to capture all your thoughts, one thing that has confused me -- I
24 think we are all in agreement for what we are looking for for an end
25 goal. You are looking for predictability. I think we agree that is
what we are trying to get to.

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We are looking to try and risk-inform a deterministic
process. I think we have said that a number of times today. That is
our goal. But repeatedly during our discussions this morning and
certainly clearly right now, the one thing that comes out to me is that

1 you are disappointed that we can't get there faster. That is what is
2 confusing to me. I mean the end result of --

3 MR. MEISNER: Well, it's semantics --

4 MR. RICHARDS: Well, let me finish, Mike. The end result of
5 where we go I can't prejudice, but certainly the goals you have laid out
6 as far as risk-informing a deterministic process and clarifying the
7 requirements, streamlining -- that is where we are attempting to get to.

8 You said you were disappointed with the approach and the
9 position to date. Perhaps you felt that we should have arrived at final
10 conclusions within the 60 days, and admittedly when we started out, I
11 was hopeful. It didn't turn out that way but my hope was on the front
12 end.

13 On the other hand, we have to have a technical basis for
14 whatever we do and that is what we are trying to do here, and ultimately
15 I think we are going to get there, so I am trying to understand your
16 comments in that perspective.

17 Are you frustrated with where we are trying to go or are you
18 frustrated that we can't get there faster?

19 MR. MEISNER: I am frustrated that you can't get there
20 faster because you have adopted an approach that ensures a several-year
21 process. You are not building on the past. You are doing everything
22 from scratch, the best I can tell. Previous Staff positions are not
23 being applied.

24 We are adding on extremely conservative assumptions in the
25 technical work that you are doing that in my mind completely invalidates
the technical work and makes it useless for regulatory decision-making.

MS. HENDRICKS: To state it differently, you made some
choices where you did in a certain timeframe. You could have made a
different choice, to use best estimate, which I personally think you
would have gotten better insights that modelling for things like lack of

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1 reasonable procedures. We could have been further along, no final
2 answer necessarily, and certainly rulemaking will be needed to codify
3 the specifics, but I think you could have come much closer to some
4 interim, practical, pragmatic positions that would have been acceptable
5 and met everybody's expectations.

6 MR. RICHARDS: Well, I'll tell you my frustration. I mean
7 we come to the table here with 60 days worth of work to share it with
8 you. That is the intent was to share what we are doing as we go through
9 it and also to share it with any other stakeholders we have, so we are
10 doing that and now we are getting a lot of frustration back from you
11 that we have come to the table with a product that you think, you know,
12 is half-baked, I guess, or the wrong assumptions in your mind, the wrong
13 approach.

14 Okay, we appreciate your opinion but I got to tell you, that
15 doesn't sound like -- you know, those comments don't help. The comments
16 that do help is we have these kind of systems. This is the way we do
17 business. This is -- you know, let's talk about these kind of events.

18 I don't know. Some of these other things --

19 MR. MEISNER: I think the real problem here, Stu, is we
20 should have been working together all along. We shouldn't go out and
21 visit four plants in four days and then go back and erect a whole
22 methodology. Why not include us in the process? Why does it have to be
23 that way?

24 MR. RICHARDS: We are trying to include you in the process.
25 We are sitting here today talking to you about what we are doing,
soliciting your feedback repeatedly.

MR. MEISNER: What I am saying though is if we had a
technical team working with your technical team all the way along, these
issues would have been brought up, addressed, and resolved somehow by
our meeting today.

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1 You know, if you had a need for procedures, we would have
2 provided the procedures. If you had a need for design information, we
3 would have provided it. But what we heard today was a lot of gee, I
4 don't know, so therefore I assume the worst case.

5 MR. RICHARDS: Well, you know, we are getting to that point
6 again -- it's a matter of timing. You think we could have done that in
7 the first week or two, I guess. We think we are doing pretty good to be
8 60 days down the road and gone this far, so if you are frustrated with
9 the timing of what we are doing, so be it. I can just tell you that the
10 group is working very hard.

11 I think our ultimate goal is common. We intend to get your
12 comments and factor that in. We intend to get the comments of the
13 public.

14 The other thing I would like to ask, Lynnette, you mentioned
15 that you think or at least NEI thinks that we ought to establish some
16 interim criteria while we work through this process. In what regulatory
17 framework would we do that?

18 MS. HENDRICKS: I would think that since you have been
19 making these decisions on an ad hoc basis it's not a big stretch to
20 codify them in guidance that would have the assurance to say that maybe
21 the approach used in the two previous guides would likely be used on the
22 next guide, but again, I think you have the opportunity to use risk
23 insights at that phase even.

24 MR. RICHARDS: Well, no, that is not the question. You said
25 we should establish interim guidance that we would apply to everybody.
That implies in my mind rulemaking.

 MS. HENDRICKS: A Standard Review Plan, a Regulatory
Guide --

 MR. MEISNER: NMSS uses what they call ISGs, Interim Staff
Guidance.

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1 MR. RICHARDS: All right, but certainly none of that is for
2 discrete issues. I mean we can crank out a Reg Guide, I guess, that
3 would additionally have to go through the public review process, through
4 your review process. One thing I would like to make clear is that your
5 comment on establishing interim guidance is not something that we could
6 put out on the table overnight and say, well here it is, and in the
7 meantime we will go through the rulemaking process. It is simply not
8 that easy.

9 MS. HENDRICKS: Well, this was actually a concept that came
10 from I guess your direct predecessor, Stu, who suggested a Standard
11 Review Plan. In fact, he suggested our assistance in helping to draft
12 it. I mean that was put forward to us by the NRC, and so maybe we are
13 still sort of in that mode, but as Mike says, it is often used in other
14 areas.

15 MR. BARRETT: Are you talking about this within the context
16 of the exemption process? Is that what you are saying?

17 MS. HENDRICKS: I am saying you make these decisions every
18 day and if you think that you don't, those case by case decisions aren't
19 viewed as adding requirements anyway. They certainly are. Some of them
20 have been challenged and --

21 MR. BARRETT: I recall a case that may be relevant here, and
22 that was when we were in the final stages of putting in place the
23 alternate Appendix J rule. There was interim guidance on how to do
24 exemptions, how to interpret 50.12 -- the exemption rule for the
25 specific case of exemptions to Appendix J, in the interim while we were
waiting for the rule to go through the process, so there may be some
experience there that would allow some form of interim guidance to be
developed. You know, we would have to go look at it and see if it is
applicable here.

You have to meet 50.12 to get an exemption. And of course

1 the 50.12 has a set of criteria in it, but what I think maybe you're
2 asking for is more specific guidance on how to meet those criteria in
3 this specific case. Perhaps that's --

4 MR. RICHARDS: I'd like to make one more comment in
5 responding to Oyster Creek. You know, it's not in a procedure or
6 something like that, but one thing we have done internally is we have
7 made a commitment to ourselves, I've made a commitment to my boss, to
8 work fairly hard with plants entering decommissioning to try and make
9 the process as smooth as possible. I believe we came out and supported
10 you in a meeting. We're certainly ready and willing to talk with you.
11 We've been talking with the Zion people. We recognize that in the past
12 maybe there were some issues we could have dealt with on a more timely
13 basis on an individual plant basis.

14 I think within the Agency the decommissioning area has
15 gotten a higher priority so that the decommissioning section is in a
16 better position to respond more promptly. We've tried to work through
17 the Maine Yankee backfit issues to put those to rest. And on a
18 plant-by-plant basis, while we're working through this, we intend to
19 continue to put a lot of energy into resolving these issues case by
20 case. We don't like doing that either. We'd like to have it all
21 packaged, put together and taken care of in a rule. But it's going to
22 take time to get there.

23 You know, I'd like to get there just as fast as you would,
24 but we have to follow the process, we have to have a sound technical
25 basis, and we have to have the public input. And we appreciate, you
know, your contribution in the future to help us get there.

MR. ZWOLINSKI: Correct me if I haven't understood the
staff, but it sounds as if we've got an issue boxed, that is, we could
essentially stop our efforts today and say after three or four or five
years or some period of time, there's no more issues with these spent

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1 fuel pools. And we could put that as our basis for all of our
2 rulemaking and switch gears.

3 But my understanding is the work that these folks have under
4 way is to take that three years and keep working it backwards to
5 whatever the right number may or may not be, 2 years, 1 year, 45 days,
6 and I don't know what we're going to get to over the next few months,
7 and with your input get to a defensible figure. In other words, I think
8 that number can become a smaller or tighter figure that might fall more
9 in the realm of what you find as acceptable vice maybe three years which
10 you don't find acceptable. But I think the staff is more on the outside
11 working its way towards a figure that might be smaller. And with
12 inputs, working with you folks, many of the examples.

13 We've worked our way through some of these ourselves, and we
14 -- do we have to, in going forward with a rulemaking, speak with one
15 voice that there would be certain things available for one year and
16 whether it's monitors for a pool level or it's operators' four-hour walk
17 or control of a crane or some of these administrative issues, we need to
18 put all that stuff in a box and put that as part of our statement of
19 considerations, and thus we can essentially move forward with a rule
20 with the underlying basis being after one year we can -- you can
21 essentially have relief for EP or any of the other rules, for example.
22 So it's to me we're never -- I don't see us going to zero, but what's
23 the happy medium?

24 These folks are, you know, we're not on solid ground yet.
25 They're telling us it's going to take us a little bit more time to get
to a point where they feel they can engage and say here's many, many
different scenarios that were evaluated, anybody can look at those
scenarios.

With real-life contribution coming back, many of those
scenarios may essentially wash. They may not become a tall tree. And

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1 we may indeed find ourselves with a technical foundation now which says
2 in so many words we can go with a period of time and thus become totally
3 predictable. And I think that still is our mantle as to be on the
4 course to develop a rule, set a rule in which it's just totally
5 predictable, and get us out of the rule -- or get us out of the day in
6 and day out let's review amendments, exemptions, what have you. Let's
7 just get the rules written right once.

8 So I can understand it's a little disappointing, but yet our
9 end state hasn't changed from what we said in so many words back on
10 March 17 to the Commission. I think you have to have one set of rules
11 and do it right. It's a little tough that maybe the basis didn't work
12 out as obviously as maybe some of us projected, but I also didn't have a
13 lot of this information in front of us, and I need to let these folks
14 work forward.

15 Now, there may have been a missed opportunity, as you said,
16 with working with you closer, but I will say we need to allow the team
17 to come up to speed and take a lot of ownership to their work. Maybe we
18 can reevaluate does it make some sense to engage now rather than wait a
19 couple of months until the product is essentially a draft product ready
20 for anybody to take a look at. But you work yourself through a couple
21 pages of discussion and you'll have the staff coming up with okay, this
22 event as it currently stands has some probability.

23 Next paragraph may be from a generic plant perspective, not
24 an individual plant, and I heard the Seabrook comment, I don't know how
25 well it fits generically, that next paragraph to me is going to be your
generic plant comment. And with these kinds of administrative controls
or changes or whatever, all of a sudden you're going to drop this by two
orders of magnitude. All of a sudden that issue's no longer on the
plate. I mean, that's where I think a lot of this is going to go. I
think Stu alluded to that earlier in the discussion today. Rich,

1 correct me if I'm overstating where it looks like this has the potential
2 to go.

3 I mean, that's kind of the direction that we're headed. We
4 don't know if it's going to be one year, six months, or a year and a
5 half today, but with your help, that will help forge whatever's the
6 right number that would be technically justified. And I think that's
7 the collegiality of the entire process, including stakeholders and the
8 entire staff yourselves. So --

9 MR. MEISNER: Yes. I agree, I think.

10 MR. ZWOLINSKI: We got into a lot of depth in a lot of areas
11 that I think we're all over a little bit. Bob, do you really need to do
12 that? But if you took a -- when I personally took a step backward and I
13 said it sure looks like we're trying to cross all the t's, dot all the
14 i's, and do it one time. And this is that one time, at least from my
15 perspective, that our senior management's looking for that one shot at
16 it.

17 Now, will it meet the Commission's expectations, or did we
18 miss a little bit? I think our goal is to deliver a product that says
19 there's the technical basis for whatever rulemaking we want to make in
20 going forward, especially the EP safeguards, indemnification, things of
21 that sort.

22 What I'm hearing, this may take another couple or three
23 months, but peer reviews and ensuring, you know, will withstand scrutiny
24 from anybody and it's a totally open process is the goal.

25 MR. MEISNER: I think, you know, we've always agreed on the
end state.

MR. ZWOLINSKI: Okay.

MR. MEISNER: I think we're simply talking about how do you
get there.

MR. ZWOLINSKI: Okay. And I hear your comment about

1 willingness to continue to interact and maybe interact in a different
2 way than we have in the past. At least you've got a sense of some of
3 the different areas that we've been looking into. You all may want to
4 think about would there be a way for it to be appropriate, interact.
5 We'll do some checking ourselves as to does it make sense to release
6 some material to everybody so they see what we're talking about.

7 I'm not sure just assumptions all by themselves are
8 credible. In other words, there's no context to them, but we can
9 certainly look at that and we can look at maybe there's another way,
10 maybe we don't issue the entire report, maybe we do it in chapters or
11 whatever or by area of review. We can at least attempt to see if we
12 can't be creative about getting something out on the street. If it
13 falls into ten chapters or do you wait until you've got one chapter at
14 the very end, that's something I'll ask the technical staff to look into
15 or consider. And if we can meet to discuss on those and, you know, some
16 things I'm sure are much further along than others.

17 The issue about the 120 days, how we're going to dismiss
18 that. Do you all have a view already? There might be a generic view
19 that you can share that essentially allows that to be much better
20 defined and roll it back to 24 hours or even something less than that.

21 MS. HENDRICKS: I think specifically in regards to that,
22 just sort of a caution is I don't think that even if you can take three
23 years back to let's say ten months, I don't think that you're going to
24 -- it's realistic to expect either the industry or even the Commission
25 for that matter to look at the approach outside the context of the
approach in general agency policy for risk-informing things. I mean, if
anything, when this was first presented to us at our last meeting, it
was viewed as an opportunity. I think Holahan said maybe it would be
the first time we'd be able to do a completely risk-based regulation.

So to a certain extent I think you're going to run into some

1 expectations of seeing things in the proper context, that the type of
2 approaches to risk-informing that are used in operating plants will not
3 be inexplicably very different in the decommissioning. I mean, that's
4 something that we'll be looking for.

5 MR. RICHARDS: We still see this as an opportunity. You've
6 said many times that we've missed it. We see this as a process that we
7 just haven't finished yet. We're not done. So, you know, maybe we
8 won't get there as fast as you think is appropriate, but you ought to
9 wait until we have an outcome before you judge whether we've got a
10 product you think is appropriate or not.

11 MR. BARRETT: We arrived at these numbers, these risk
12 numbers, using the best assumptions and the best information we had
13 available. We're not interested in showing high risk numbers. We would
14 much rather see low risk numbers and have an explicit justification for
15 those low risk numbers.

16 And I think that by having this last defined and saying here
17 are the types of initiators that could get you there and here are the
18 types of sequence analyses that you would have to go through to figure
19 out how likely those things are, we can then come back and -- you can
20 come back and say here are the safeguards, here are the barriers, here
21 are the things that lead us to believe that these are very, very low in
22 probability, lower than what you've calculated, NRC, or perhaps even
23 incredible for some of the scenarios.

24 Then we would have the basis for concluding that we can
25 approve whatever it is that, you know, falls out of that analysis. And
any stakeholder, whether it's a public interest group or a member of the
public or someone living near one of these plants, can pick up this
report and say here are the concerns the NRC raised based on their
preliminary analysis, and here's how they were dispositioned by real
things at the plants, that apply to all the plants, for instance, or

1 real things that apply to this plant, other real things that apply to
2 this plant. So we can understand where we are and how we got there and
3 what we can expect of each other.

4 So I think I can understand your frustration with this, and
5 I know that going back a few months you felt that there was a technical
6 basis for being farther along today than where we are. But frankly we
7 didn't set out to do a conservative analysis here. We set out to do the
8 best analysis we know how to do, and we've got some very good PRA
9 analysts, and they did it by the book, and to the extent that we missed
10 the mark, I think that that can be informed by better information about
11 what you actually have at the plants and what you intend to have at the
12 plants in the future.

13 MS. ORDAZ: I just wanted to add, in this short period of
14 time we just came to certain assumptions and preliminary results in the
15 past couple of weeks, so this really is the first opportunity to share a
16 lot of this information with you, and we continue to do that.

17 MR. KELLY: I wanted to take a second just to -- there were
18 two things that came up and I wanted to make sure it was clear from our
19 standpoint where we stood on them. One of them was the discussion about
20 NUREG-1353 and about its -- I believe the way it is kind of portrayed,
21 it should have been used as a base for making a decision about the
22 decommissioned plants and the risks associated with their spent fuel
23 pools.

24 1353 was particular to operating plants, and the reason why
25 seismic stuck out for 1353 was that, being operating plants, they had
all of these additional makeup systems, levels of defense-in-depth,
additional margins in that which are not available at decommissioned
plants today. We went back and looked at 1353. It had some useful
information for us for decommissioned plants, but it wasn't adequate
analysis for decommissioned plants.

1 We went and looked at event trees and fault trees that had
2 been performed for decommissioned plants, and looking at spent fuel
3 pools, some work that was done by LLNL for us. We built it on that work
4 and on the information that I got from making the plant site visits,
5 because 1353 in and of itself does not provide you with the appropriate
6 information for making any kind of decision at a decommissioned plant.

7 The information that we modeled in the PRA was based on
8 positive as well as negative information. There are a lot of things
9 there that I realized could have been much worse, but, for example, I
10 was very happy with the kind of operator oversight that I saw at the
11 decommissioned plants. We are happy with the way that they are
12 monitoring levels which could have a lot worse. But what we did is we
13 basically modeled what was there. Not what we wanted to be there, or
14 thought could be there -- we modeled what was there.

15 We modeled the procedures. When I asked people about the
16 procedures, their emergency procedures, they showed me. And based on
17 that, I made my decisions about what kind of information would be
18 available for the operators. When we went to quantify these human error
19 rates, we didn't make up something from the point of view of, you know,
20 giving no credit for the operator when there are no procedures. We used
21 the traditional method that you use when you perform a PRA, and this is
22 for all kinds of PRAs, that there is are no procedures, you get less
23 credit or it is assumed that there is a higher probability of operator
24 error than if you have procedures, step by step procedures.

25 We went through all of these things when we were performing
 our PRA because we tried to use the methodology the way it is ordinarily
 used, but we had to change it somewhat because the decommissioned plants
 aren't identical in many ways to operating plants.

 And there was one other point that I wanted to bring up.

MR. MEISNER: Before you go on, let me just say you missed

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1 the point. I understand that, that there are design differences between
2 1353 plants and decommissioning plants. I brought this up specifically
3 with respect to the seismic methodology, where we took that methodology
4 and overlaid it with the Lawrence Livermore and EPRI data. You seem to
5 have done something entirely different.

6 And my point was you have got a methodology that the staff
7 has used in the past, why not stick with it? Why continue to come up
8 with something new? It wasn't with respect to the other sequences.

9 MR. KELLY: Okay. There is particular reasons why we didn't
10 do that, and it had to do because we weren't satisfied with the
11 fragility analysis that had been performed on the pool. There were two
12 generic pools that were evaluated, those were not actually even specific
13 fragility analyses to pools, they were kind of generic analyses that
14 were performed and we felt, in looking at them, that we did not believe
15 that, in doing for analysis here, that we could rely on those particular
16 values in their fragility analysis.

17 MR. MEISNER: And that was my point, every single thing that
18 comes up, we do it newly, even though that information and approach was
19 relied upon to make regulatory decisions some years ago.

20 MR. KELLY: It was -- right. But we are talking about a
21 different type of decision here. The decision that was made there was
22 dealing with backfits and the need for backfitting plants, and from that
23 standpoint there was a certain level of confidence that was adequate in
24 order to determine -- because if you are off by a factor of 2 or 4 or 5
25 or 10 on it, from the dollar amounts that you are going to have, it
didn't make any difference. There still wasn't going to be enough money
to make a backfit available. Therefore, it didn't -- wasn't important
to you whether or not you got the number that close.

We are not in the same situation here. And because of that,
we had to come up with an evaluation that we felt we are a little bit

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1 more comfortable with in determining, you know, what were the potential
2 risks associated with a seismic and the spent fuel pools.

3 MR. MEISNER: But I disagree, we are in the same situation
4 here. In my mind, it is still an open backfit issue that hasn't been
5 resolved.

6 MR. KELLY: Well, when you come in for an exemption, that is
7 not a backfit. There is a big difference between an exemption and a
8 backfit.

9 MR. MEISNER: Well, that is something I know something about
10 and we still have an appeal pending before the EDO. I don't think that
11 is a closed issue at all.

12 MR. KELLY: Just one other point, someone else had made a
13 point about saying that we are not giving any credit for operator action
14 or that there is very little credit, or it sounds like, you know, that
15 the operators are not doing anything in this one week period, 120 hours.

16 What we are saying is that 9,999 times out of 10,000, the
17 operator is doing exactly what he should be doing, that they are
18 mitigating this and they are taking care of all the things. We are
19 saying that that one time out of 10,000, the operators don't do what
20 needs to be done.

21 Now, you may quibble that that is not the right number. We
22 don't think that that is an unreasonable number to take for a human
23 error rate, and we understand the 120 hours, none of this is
24 proceduralized. The plants don't have procedures for dealing with these
25 kinds of problems. There are no action levels to tell them, when the
water level gets to here, I do something. When this happens over here,
I have got to something. There is none of that that is available. So
it is basically the operators making ad hoc decisions, and it may be a
great decision most of time. Maybe there are great decisions 9,999 out
of 10,000. But that was the number that we came up with using the best

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1 information that we could come up with and some really good human
2 reliability experts gave us those numbers, and gave us a good feeling
3 about what was appropriate there.

4 So it is not like we are not giving any credit for the
5 operators. We are assuming that these operators do it the vast, vast,
6 vast majority of the time. Numerically, it still comes out several
7 times 10 to the minus 6 , and we feel that that this at this time, you
8 know, absent additional information, that is an appropriate number.

9 MR. MEISNER: Understood.

10 MR. DUDLEY: Other comments?

11 MR. BAGCHI: Can I just update something on the seismic
12 issue? In the NUREG, there was specific information about the 50
13 percentile value and the HCLI value, and we did not deviate from the
14 NUREG. We did not neglect information that was presented in the last
15 meeting. We went ahead and used pretty much what the seismic capacity
16 was determined to be, or, in other words, it was about three to
17 three-and-a-half times the SSC. In case of PWRs, it is a little higher;
18 for BWRs, it is a little lower. But that is in the order of magnitude
19 that the NUREG had determined.

20 We took that value, took that capacity to be around three
21 times SSC and then we went to the same source of information, or, in
22 other words, the Lawrence Livermore latest seismic frequency and used
23 that number, and that was 2 times 10 to the minus 5 and then since it
24 was a HCLI value, a very simple information was that it would be
25 multiplied by $.05$, so it was 1 times 10 to the minus 6 . We used the
same kind of information.

We believe that if we do develop any kind of a guidance, we
are going to say that before you come in for your amendment, make sure
that your seismic capacity of the pool is of the order of three times
SSC. That should be eminently feasible for most plants.

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1 MR. MEISNER: Again, the point is not did you use the same
2 information, but did you use a new methodology that hadn't been used in
3 1353? And I think what we heard is yes.

4 MR. KELLY: And we have absolutely no problem with doing
5 that, because we have -- there are many different ways that you can
6 perform a PRA analysis, and depending on what it is that you are trying
7 to do, or the level of sophistication, or the details of the number or
8 the accuracy of the number, you are going to do different types of
9 evaluations. A margins method versus a detailed seismic PRA, both can
10 give you adequate information, or may not give you adequate information,
11 depending on what the bottom line is that you are looking for.

12 In this case we felt that the particular methodology that we
13 used gave us the type of information that we needed. If we had had
14 detailed fragilities of spent fuel pools, we would have done a
15 convolution with the hazard curves to come up with detailed risk
16 numbers. We didn't have that information available, we didn't feel that
17 we could get it in any type of reasonable timeframe, so we went ahead
18 with the best information that we had, and with that information we
19 weren't able to use the identical methodology that was in 1353. So we
20 went with the best process that we could and that is where we ended up.

21 MR. MEISNER: But you understand the point, right?

22 MR. KELLY: I understand.

23 MR. MEISNER: If you are continually changing methodology,
24 and you can never compare apples to apples, then --

25 MR. KELLY: But we don't see any reasons to compare it to
1353 because that was for operating reactors, it was providing us with
something else. We were asked to provide --

MR. MEISNER: Not in the seismic area.

MR. KELLY: We were asked to provide a technical basis for
making decisions about, in essence, what was the risk associated with

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1 spent fuel pool. And I might have chosen any one of a number of
2 methodologies, all of which would provide me with a pretty accurate
3 number, and I can use that for determining what kind of risk I am
4 getting from seismic or something like that. We chose the one that we
5 did because it worked best with the information that we had available.
6 If we had different information, we might have chosen a different
7 methodology.

8 MR. MEISNER: I mean we can go around and around about this,
9 but the fact remains that the staff does not maintain consistency from
10 one week to the next in just about any technical issue associated with
11 decommissioning. And it gives the industry absolutely no stability.

12 I am going to give you an example. Doing these zirc fire
13 analyses, you know, for a while the staff was pushing -- do your own,
14 use the SHARP Code. I understand now you won't even accept the SHARP
15 Code. You can't keep changing things. You have to have some
16 consistency from day to day, else there is no stability in the industry.
17 And when you keep doing it newly from scratch every single time, we get
18 into these situations like we are where, rather than having a three to
19 six month effort, you are talking about a two to three year effort.

20 It is unwarranted, particularly when up to this point, until
21 you started doing it from scratch again, the only issue of concern was
22 zirc fire. We could have simply disposed of that and moved on. Instead
23 we have sequences that have been examined in the past and found
24 acceptable overlaid with uncertainty as to what are the procedures or
25 what is the design. So we are doing it all over again.

MR. KELLY: Well, we would have no problems if the
decommissioned plants looked identical to the operating plants and had
all of the equipment, the RHR system, emergency diesel generators and
all of the other things that were there in 1353, but they are not there.
And when we model it, we are not going to model it as if all of this

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1 equipment is there. It is simply not there.

2 MR. MEISNER: All right. I understand that. But what you
3 can do is model --

4 MR. KELLY: I don't understand why you keep saying to use
5 1353 when 1353 has nothing to do with decommissioned plants.

6 MR. MEISNER: You are missing the point. It has to do with
7 seismic. Seismic was the issue if you go back a few months.

8 MR. KELLY: Right. It was the issue because the other
9 plants are operating plants. These are not operating plants. Seismic
10 is only a little minor contributor here because there are other things,
11 because you have an entire -- it is like I have this plant over here
12 that is designed this way and have this plant that is designed over
13 there this way. You want to take this plant and say do this analysis
14 and just do that, and only look at the problems over here, forget about
15 how this plant is designed. Well, this plant is designed entirely
16 differently. You have to look at how this plant is designed, do a risk
17 assessment for this plant. This plant is not applicable to this plant
18 over here.

19 MR. MEISNER: Got it. But it is for seismic.

20 MR. RONE: I think what you are hearing is an awful lot of
21 frustration on our part on this.

22 MR. MEISNER: We can't ever pin the NRC down, that is the
23 problem. You know, you can come up with a new analysis tomorrow, done a
24 different way, and say, oh, this is better than that. You have to at
25 some point say, I am going to stick with my previous staff decisions.

MR. RICHARDS: And when we get it codified, Mike, we will
have to do that. That is why we are trying to get it all packaged, put
into a rule. And you will admit, I think, that once it is in a rule,
then we have to apply the backfit process in order to go against
whatever is in the rule, right?

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1 MR. MEISNER: Right. But the way I read the regulations,
2 Stu, is you have to do that now anyway for any staff position. You
3 can't willy-nilly change them as you go along because you prefer not to
4 do -- prefer to do something different. Whether it is rulemaking or
5 not, the standard is, have you changed the staff position? It is not,
6 are you going to rulemaking?

7 MR. RICHARDS: All right. But you are taking us to the
8 backfit argument about how do we deal with exemptions. And, like you
9 said, that is still before the EDO, so I don't think we need to get into
10 that.

11 MR. RONE: I don't think we disagree with going to
12 rulemaking on this. In fact, we would say that that is the right
13 direction to go, is to go to rulemaking on this. But I think we are
14 coming at it from two different perspectives. In order for us to set
15 the framework for what the rule should be, you have to agree upon what
16 is the credible accidents, what do you need to deal with in the
17 decommissioning environment. And that is where the disagreement is.

18 You know, the utilities, at least the ones in the
19 decommissioning working group, believe that zirc fire and spending
20 money, not a few bucks, but literally millions of dollars a year to
21 maintain a security plan, insurance indemnification, security, all those
22 issues associated with zirc fire that you have to deal with, is a poor
23 choice of where to spend money in a decommissioning environment.

24 We believe the probability is sufficiently low that we need
25 not consider it. Okay. So, you know, that is kind of the difference.
The staff was of a position that, yes, zirc fire is credible and you
need to consider it. The industry was, no, that it is not.

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We start looking at -- well, okay, how can we do this on a
plant-specific basis? We pick an analytical tool, at your
recommendation, the SHARP Code. We do the analysis and it says zirc

1 fire window for Oyster Creek is three-and-a-half months. Okay. Well,
2 can I live with three-and-a-half months? Yeah, I can live with
3 three-and-a-half months.

4 When it comes down to specifics, we hear that the SHARP Code
5 is no longer accepted by NRC. And, in fact, there is no suitable
6 analytical tool which is available to us to do a plant-specific
7 analysis. So now we are dropping back to using, you know, kind of
8 deterministic approaches. And I would presume that some of this kind of
9 thinking went into your coming up with the two years for boiler and
10 two-and-a-half years for pressurized water reactor, adding additional
11 conservatisms to account for uncertainties that are in the code.

12 So what that does is that stretches out the zirc fire
13 window. It stretches out the period of time we need emergency
14 preparedness, higher levels of insurance indemnification, and so on.
15 And what was a few million is now \$5 or \$10 million, and it is all based
16 upon something that we don't believe is credible in the first place.
17 And what you are hearing from us is a lot of frustration around this.
18 We are going to spend a lot of money and a lot of time dealing with
19 things that we don't think are credible. And not only do we think that
20 they are not credible, we think they are not credible by inspection,
21 that there is enough already on the docket in order for the staff to
22 conclude that zirc fire is of such a low magnitude of probability that
23 it need not be considered.

24 Those are two different opinions. I mean your job is to
25 thoroughly research this thing, to do your own independent assessment,
which is what you are doing, and we would applaud you in doing that. In
fact, I think it is terrific what you have done with the technical
working group and the focus and the emphasis that this has gotten so
far.

And the specific points that we have brought out, I think we

1 would offer again the opportunity to work with the staff in providing
2 answers, in providing insight, in providing more detail in the areas
3 where you have insufficient information to have a conclusion around
4 human error rates, for example.

5 I would again extend the offer for us to help in this, and
6 appreciate that we're going through a process and that there are
7 different opinions and different points of view, and at this point it's
8 difficult to say which is the right one.

9 MR. RICHARDS: All right. Well said.

10 Anything else?

11 MR. DUDLEY: Okay. I guess we're to the public comment and
12 question period. Mr. Atherton, you've signed up -- and Mr. Shadis.

13 Okay, Ray, I'll let you go first, and then Peter will follow
14 up.

15 MR. SHADIS: Thank you. Ray Shadis.

16 I'll try to make this brief. I appreciate the difficulty of
17 trying to resolve two points of view here. I've heard that the
18 probabilities really don't matter because if you look at the
19 consequences, the consequences are inconsequential, that there's no way
20 you can have a release to trigger EPA action levels off-site. That's
21 what I heard from this side of the table very early on this morning.

22 The question is in terms of precautions, in terms of those
23 things which are in the regulations, a lot of these probabilities can
24 get kicked around an order of magnitude or more without changing the
25 requirements for vigilance. If there are consequences off-site that
have to be dealt with, then from the public perspective, whether the
risk is 10 to the minus 6 or 10 to the minus 7 really doesn't matter a
heck of a lot. And I think we have some reservations too. Although
it's laudable to get the input that you can get from the industry, we do
have reservations about how closely NEI engages NRC staff in working on

1 joint projects, if that's what it's to become.

2 I personally have worked on enough joint projects to know
3 that it never really comes out the way I intended it to from the
4 beginning. So from the public perspective and especially from the
5 activist perspective, we're very leery of seeing a, if you will, just a
6 joint project go forward without having the public there to be looking
7 over everyone's shoulder.

8 One thing that was missing --

9 MR. ZWOLINSKI: Now you understand, Mr. Shadis, that the NEI
10 position doesn't conflict with the NRC position other than the amount of
11 time. In other words, we're not -- we can't agree with the NEI position
12 today. We would say it's much more topping that you need before the
13 pool becomes essentially benign.

14 MR. SHADIS: Well, you're talking about is there a fire
15 window or something?

16 MR. ZWOLINSKI: Right.

17 MR. SHADIS: I understand that difference, but I --

18 MR. ZWOLINSKI: And that's what we were wrestling across
19 most of the discussion.

20 MR. SHADIS: Yes, sir. It was one of those things.

21 MR. ZWOLINSKI: Okay.

22 MR. SHADIS: One of those things. But only one. And, you
23 know, and if we're talking about issues involving personnel and whether
24 they're going to quickly take action or whatever, I don't know how many
25 of you recall an incident at Indian Point where the containment was
flooded. I don't remember the exact numbers, but I'm thinking it was
two or three days before it was discovered that it was filling, and we
had like 12 feet of water in there, something like that. That was in
the early to mid-eighties.

That's a scene where you would say where was everybody, you

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1 know. Where were the auxiliary operators? Didn't anybody look?
2 Weren't there -- you know, wasn't there any indicator? And, no, there
3 wasn't, and the scene went on. So from a layman's perspective, from a
4 public perspective, we see some of these scenarios as they stretch out,
5 and the inability of operators and licensees to take action as credible
6 and important.

7 One thing that I have been missing in all of these
8 discussions is any discussion regarding radiological sabotage or however
9 you term it safeguards wherever it may come. And I understand that
10 particulars can't necessarily be discussed in a public forum. But
11 certainly if you're trying to risk-inform something, there needs to be
12 some way that that has to come across more than just a heading in an
13 outline. I think from a public perspective we would like to be
14 reassured that this is being considered and being adequately considered.

15 MR. KELLY: Can I say something?

16 MR. SHADIS: Sure.

17 MR. KELLY: From a risk perspective, it's not a simple
18 matter to try to determine what's the chance of having an act of
19 sabotage in a nuclear powerplant. That type of work has been done for
20 military facilities. We don't traditionally do that for the nuclear
21 powerplants themselves.

22 What we have thought about and what we're considering doing
23 is preparing a list of equipment that we feel is the most significant
24 equipment and provide that information to the safeguards people so that
25 they can in turn make a determination about how they feel that equipment
should be guarded. So we'll make them aware of the equipment that we
felt was most important, and in turn they can decide, you know, what
measures they feel are appropriate for it.

MR. RICHARDS: Mr. Shadis, I'd just like to tell you that
the security people, I don't think they're represented here today, but

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1 they are engaged in the issue, and it does involve, as you said,
2 safeguards information.

3 MR. SHADIS: Well, you know, I wanted to make the point that
4 from our perspective that that particular threat, if you will, needs to
5 be more directly focused on, so that we can hear and see something of
6 it.

7 This is going to Mr. Huffman's outline, but the notion of
8 bundling -- and it goes just beyond the three items that we have on the
9 table -- but the notion of bundling these regulations we spoke about
10 before and heartily approve of that, bringing all the decommissioning
11 regulations together in one place where they can be found, seen, worked
12 with. But it also opens the way, I think, to consideration of bundling
13 the applications, if you will, rather than having a licensee come in and
14 hand you a stack of requests for exemptions or whatever they may be.

15 There really ought to be an application that says we're in
16 phase 1 of decommissioning and here are all the technical details
17 related to our operation, here is a detailed plan of how we intend to
18 use our resources, and that that form part of an application. We'd also
19 like to see that worked into the public process so that, you know, there
20 is an accountability there to the public to see that all of the issues
21 in those bundled regulations are addressed. An opportunity to intervene
22 would not hurt at that point.

23 It would be good to see that process formalized. Right now
24 you have this PSDAR, which I don't know if it tells the NRC anything,
25 but it doesn't tell the public anything. And it may be a general game
plan for the licensee, but that particular little application could be
expanded to include Phase 1 of decommissioning and could address most of
these issues, should and could be addressed in that initial application.
But, you know, and then I say this at the risk of having that be
something that can fly past us. I do think it needs to be formal, and I

1 do think it needs to provide the opportunity for intervention, so that
2 the licensee's representations in that application can undergo the tests
3 of truth in the public arena.

4 MR. ZWOLINSKI: I'm not sure how the ultimate packaging will
5 take place in that final regard, but as we go through with the advance
6 notice of proposed rulemaking, that would be an excellent area or
7 opportunity window to craft a comment along the lines of what you've
8 just suggested, and perhaps the PSDAR should have additional milestones
9 as to when licensees would take advantage of certain rules that they
10 essentially would not be required to adhere to any longer.

11 If, for example, the rule that we promulgated was to give
12 licensees relief of EP after let's say hypothetically one year, if they
13 want to take advantage of that, they might say so in the PSDAR. That
14 would be -- the NPR would be a good place to talk about that.

15 MR. SHADIS: Okay. I think that's all I have at this point.

16 MR. ZWOLINSKI: But if you have any additional thoughts on
17 the process and packaging and its own part, and what we're trying to do
18 is work through all the appropriate rules and regs so we really are
19 clear on what belongs in decommissioning. We think that allows everyone
20 to know the ground rules, predictable to the industry. I trust the
21 public would feel much more informed and knowledgeable. Here's what
22 applies and what does not apply. And there's some gray areas that we
23 have identified that we want to work our way through.

24 MR. SHADIS: I think that we've all seen the difficulty in
25 transition from operating status to decommissioning status.

MR. ZWOLINSKI: Yes.

MR. SHADIS: And, you know, and if public confidence is
indeed a goal, then the series of episodes that we had, for example, at
Connecticut Yankee, which are fairly well documented, everybody's pretty
much familiar with what happened down there.

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1 MR. ZWOLINSKI: Yes, sir.

2 MR. SHADIS: You know, that may well have been avoided. If
3 there was a hurry-up/slow kind of process where that company was
4 required to step back, formulate a detailed plan for what they were
5 going to do, provide all the specifics, go through some sort of
6 permitting, if you will, if not licensing process, a permitting process
7 of some kind, permitting -- allowing the public, really, to have input
8 and scrutiny of it, we might not have had that series of incidents.

9 MR. ZWOLINSKI: Hindsight's 20/20.

10 MR. SHADIS: There it is.

11 MR. ZWOLINSKI: No, and that's the challenge for the staff
12 in going forward, working with all of our stakeholders. This stuff has
13 to make sense, and we have to be able to defend what we're doing, what
14 our rules are, and I trust the public needs to be able to understand
15 what they're --

16 MR. SHADIS: Well, and as much as I sympathize with the
17 NEI's stated position that they would like to have some security in
18 this, they'd like to have some consistency and so on, but let me tell
19 you that from a public advocate's point of view, it's even a little more
20 weird to try to deal through a constantly shifting regulatory scene.

21 MR. ZWOLINSKI: Thank you for your comments.

22 MR. DUDLEY: Mr. Atherton, you had additional comments.

23 MR. ATHERTON: Okay. My name is Peter James Atherton again.
24 I would like to start by asking was there -- they had a second meeting
25 that I was knowledgeable of last month in May, May 5th, and this was
held on the eighth floor of the other building, if I recall correctly.

MR. DUDLEY: Yes.

MR. ATHERTON: And was there a transcript or was there
a summary?

MR. DUDLEY: There was not a transcript but there was a

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1 meeting summary that was issued.

2 MR. ATHERTON: Okay, I wasn't privy to that. I don't have a
3 copy of it, so --

4 MR. DUDLEY: Okay. I believe I have your address. You use
5 a post office box?

6 MR. ATHERTON: Yes.

7 MR. DUDLEY: Okay, I'll make sure a copy of that meeting
8 summary is sent to you.

9 MR. ATHERTON: Well, part of the meeting summary or the
10 brunt of the meeting summary had to do with Mr. Holahan discussing the
11 technical working group's mission and he provided a technical basis
12 outline which seemed to effectively bound all the problems that they
13 anticipated encountering.

14 MR. RICHARDS: You are talking about the list of scenarios
15 that were going to be reviewed?

16 MR. DUDLEY: That was at the May 5th meeting.

17 MR. ATHERTON: This was the May 5th meeting. The title of
18 this is the Technical Working Group Mission Statement, followed by a
19 three-page outline called Working Group Technical Basis Outline.

20 MR. DUDLEY: Okay.

21 MR. ATHERTON: What I haven't seen, and that may be because
22 you haven't gotten to it, is somebody following this outline and making
23 a presentation today concerning where it is you are and what it is you
24 are doing, for the most part.

25 MS. ORDAZ: That is a work-in-progress document that Mr.
Holahan went through at the meeting and a lot of those items will be
covered in the report that we issue in August that will be out for
comment for everybody to take a look at and give us feedback on.

What we were doing today is giving you some highlights on
our very preliminary results instead of going through all the level of

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1 detail in the outline.

2 MR. ATHERTON: Okay. I was just -- I could not follow the
3 presentation from the outline. In other words, there were areas that
4 were not effectively addressed there like the criticality issue,
5 which -- I am representing this from the perspective of someone out in
6 the public near a nuclear power plant, and the primary concern is going
7 to be not how the plant is being taken care of, not how strong the walls
8 are, but whether or not there is any possibility that he might get
9 zapped with some radiation, so I start from whether he can be zapped with
10 radiation and go back into the spent fuel pool area and ask what are
11 the possible scenarios that would release radiation to the environment.

12 The criticality issue, from my point of view, was addressed
13 somewhat superficially and in my opinion very patronizingly, and not in
14 any technical depth at all.

15 There was no organized method of how they were going to
16 approach the potential for criticality and the potential for release of
17 radiation. This does not appear to have been taken into account in any
18 serious manner, from my point of view, and I look at this and if
19 somebody in or around the nuclear power plant asked me what is the
20 possibility of us getting zapped from any kind of an incident at a spent
21 fuel pool, and I can't tell them that they have taken into account
22 everything that I figure should be accounted for.

23 The criticality issue, in my mind, needs to be addressed.

24 MR. RICHARDS: Mr. Atherton? We have heard that comment I
25 think going all the way back to the first of the three meetings. The
technical working group has that on their list. Rather than try and --

MR. ATHERTON: Okay.

MR. RICHARDS: -- do that on an ad hoc basis here today,
which I think you are alluding to from this morning, I would ask that
you wait until we issue the draft report and see if you could comment on

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1 it at that time, because it should be addressed then. In that way it
2 won't be an off-the-cuff presentation to you.

3 MR. ATHERTON: Okay. I will move on then.

4 There has been talk about offsite power loss as a
5 possibility. There has been talk about electric power buses not meeting
6 operating redundancy requirements and possibly qualification
7 requirements. I was wondering is there anybody in the instrumentation
8 electrical power arena who is involved in this to present some
9 information concerning why we don't have simply redundancy, why
10 equipment qualification isn't important, and why we appear to be relying
11 upon operator action.

12 I am saying this from the perspective of an operating
13 nuclear power plant where there are a lot of automated systems which
14 automatically take place under certain scenarios that are postulated.
15 That is what I am used to, and I am not seeing this in the spent fuel
16 pool arena.

17 MR. RICHARDS: All right. Why don't we take that comment,
18 too, on the record and we will see if we can respond to you at the draft
19 report.

20 MR. ATHERTON: The seismic issue, for instance from the
21 operating side of the fence, general design criterion two of 10 CFR 50,
22 Appendix A, which is the general design criteria for nuclear power
23 plants, permits a single failure coupled with an event, and everything
24 that is not qualified or not designed to function involving those two
25 systems, those two incidents simultaneously occurring would not be
functional in the deterministic approach to the design of nuclear power
plants from a safety perspective.

Looking at it from that point of view in the spent fuel pool
arena, taking a seismic event coupled with a single failure, we don't
have electric power, we don't have probably pump operations. We don't

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1 have a lot of things that we would like to have in this sort of a
2 scenario and I haven't seen any criteria which would specify, maybe with
3 the exception of an occasional tech spec, which would specify why
4 automated operation or equipment qualification of at least one item of
5 equipment would not be functional either to be operated manually or
6 automatically in the event of some design basis situation that you can
7 come up with.

8 I haven't heard anything in the last three sessions,
9 included today, that I have been to over the last three months, that
10 addressed this scenario and I was curious as to what the criteria
11 involving the spent fuel pool would be in this particular arena. I say
12 this in view of the fact that in the operating side of the fence we have
13 a containment -- I have said this before -- we have a reactor coolant
14 system which is designed not to fail. In the event that it fails, we
15 have engineered safety features to help mitigate the consequences of the
16 accident.

17 As a last resort in this defense-in-depth concept we have a
18 containment building capable of holding everything that does escape into
19 the environment within the containment within I presume certain leakage
20 rate design requirements. We don't have the equivalent of that around
21 the spent fuel pool and is there a philosophical approach which says,
22 hey, we might start thinking about a containment structure around the
23 spent fuel pool? If not, why not? Are you looking into these types of
24 possibilities?

25 MR. ZWOLINSKI: Well, you took your thought just one step
too far. You were right on the mark until you started getting into
modifications of the plant. The question on the table that the Staff is
challenged with working with the industry is how long can the industry
operate their facility in the decommissioning mode with redundant
equipment in place, redundant electrical, fluid systems, whatever, and

1 then at what period in time -- six months, eight months, a year, can the
2 licensee begin to take equipment out of service and remove it from the
3 facility -- In other word remove diesel generators, remove large cooling
4 pumps, remove piping systems, so it is that -- I see that as an issue.

5 When those systems are there, it changes our probabilistic
6 analysis numbers considerably It's when we went out and took a look at
7 some plants and found a lot of that equipment was gone, we
8 double-checked and found that these pools were in fact quite old and
9 were not going to be a risk to the general health and safety of the
10 public, but in the near term when they have the potential to be a risk,
11 Zion, Millstone 1, other plants that have recently shut down prematurely
12 have redundant equipment available and their pools get cooler and cooler
13 as days go by. Of course the iodine is gone.

14 MR. RICHARDS: In any event, as I think you have probably
15 heard several times today, zircalloy fire in the spent fuel pool is
16 outside the design basis of the original plant and in any case, you
17 know, by any argument I think is a relatively low probability event.

18 You are asking I think the same question the industry is --
19 what is the criteria here to go forward. We're trying to put this into
20 a risk perspective, hopefully for the final time, to go forward.

21 MR. ATHERTON: If I could produce some insight, in the 1970s
22 when I worked with the Nuclear Regulatory Commission a spent fuel pool
23 was not considered as part of this overall operation as I understood it,
24 because the fuel would not be there very long. It was going into a
25 recycling program.

Now after I left, the recycling program was killed and you
had to look at the spent fuel pool from a different point of view, and
the question I have is what point of view are you looking at it from,
you know, from an overall perspective.

What occurred in the '70s for most of the nuclear power

1 plants that are on-line today is the design requirements there changed
2 once the recycling program was terminated -- fuel recycling program.

3 MR. ZWOLINSKI: I am not aware of that K-effective change.

4 MR. ATHERTON: I didn't say K-effective.

5 MR. ZWOLINSKI: It was in our standard review plan. It was
6 issued in '74. The seismic design of these pools were in the standard
7 review plan of '74.

8 Now one of the things that occurred was with the national
9 policy evolving, there was the change that more fuel ended up being
10 stored in these spent fuel pits -- the reracking issue -- and thus far
11 more fuel has been stored in these pools than originally anticipated,
12 but each one of those license amendments has gone through independent
13 analysis and very close scrutiny by the Staff prior to approval.

14 I think the first one that I recall, Big Rock, in '84 went
15 to hearing and thus has this whole matter of expansion of the spent fuel
16 pit through a reracking methodology has become a very common undertaking
17 for the industry, and I am not aware of any new or different safety
18 issues at all that have not been thoroughly evaluated by the Staff over
19 the last 15 years of examining reracks.

20 MR. ATHERTON: You just admitted then that there was a
21 design change requirement as a result of the fact that the spent fuel
22 pool had to store more fuel than it was probably originally designed --

23 MR. ZWOLINSKI: In some cases spent fuel pool cooling
24 systems were modified slightly, racks were changed, but ultimately
25 seismic criteria, design criteria were all in line with the licensing
basis of the plant. The Staff was able to make an independent finding
from the licensee that it was safe to operate with the additional fuel
pit.

Those licensees that are operating today have all been
reviewed and approved.

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1 MR. ATHERTON: This takes into account the problems we are
2 talking about today. I guess the only real one we have talked about is
3 the zirc fire.

4 MR. ZWOLINSKI: The Staff prefaced the comments at the
5 beginning of the meeting that we are not talking about operating
6 reactors. We are talking about facilities in a shutdown condition,
7 essentially de-fueled and in a decommissioned state.

8 MR. ATHERTON: The question I had was when they considered
9 the reracking to accommodate more spent fuel --

10 MR. ZWOLINSKI: Yes.

11 MR. ATHERTON: -- did they consider the problems that we are
12 now looking into as possible causes of a radiation release. When did
13 zirc fire become an issue?

14 MR. ZWOLINSKI: It's always been K-effective but --

15 MR. KELLY: The reracks primarily looking, assuring that you
16 had adequate K-effective and assuring that the spent fuel pool cooling
17 systems were capable of handling the increased heat loads.

18 MR. ATHERTON: But that meant as I understand it, for the
19 most part, bringing fuel closer together with some kind of -- what is
20 it, a boral? -- or some sort of a neutron blanket --

21 MR. KELLY: Right.

22 MR. ATHERTON: -- between them.

23 MR. KELLY: Right.

24 MR. ATHERTON: It could be the additional density.

25 MR. RICHARDS: Mr. Atherton, do you have a copy of
NUREG-1353?

MR. ATHERTON: I sure don't, not with me..

MR. RICHARDS: Perhaps we can send you a copy of that.
There was a generic safety issue that had to do with operating reactors
and the risk that the spent fuel pool posed to operating reactors. The

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1 NUREG is the disposition that has been alluded to quite a bit here
2 today. Maybe we can answer your question by providing you with a copy
3 of that, and then if you would like to call us and talk about it, we can
4 do that.

5 MR. ZWOLINSKI: That also introduces the zircalloy fire
6 phenomena --

7 MR. RICHARDS: Yes.

8 MR. ZWOLINSKI: That is the primary topic of that. It was
9 resolved in that generic issue.

10 MR. DUDLEY: For operating plants.

11 MR. ATHERTON: What I am suggesting is that designing or
12 redesigning something after something is built did not take into account
13 the problems that might be encountered should you have taken that same
14 situation back during the design phases and made a different perspective
15 of it.

16 For instance, the potential for radiation release,
17 ultimately, just what I am trying to represent at this point in time.

18 MR. RICHARDS: We hear your comment, but I disagree with
19 your conclusion. I think it was analyzed, and I think Mr. Zwolinski
20 indicated that as part of the reracking, there was a lot of engineering
21 work done. And, furthermore, this beyond design basis event was
22 reviewed in this NUREG that we will send you that describes what the
23 potential for releases basically amounted to.

24 MR. ATHERTON: Okay. And I will continue down the list
25 here. In this reracking, the qualification of the new racks were
designed to meet -- to last how long?

MR. RICHARDS: Mr. Atherton, we don't want to go into a
dialogue of reracking. This is really a dialogue on decommissioning.
You know, we would certainly welcome your comments if you want to
provide that to us offline. But that is not the issue today.

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1 MR. ATHERTON: It had to do with, say, the qualification of
2 the structure itself.

3 MR. RICHARDS: Without getting into a lot of detail, we have
4 already told you that the reracking of spent fuel pools was a seismic
5 undertaking. So unless you have a specific concern, we can talk about
6 it separately as far as reracking not meeting some criteria.

7 MR. ATHERTON: What about its qualification --

8 MR. RICHARDS: I think we need to move on in the
9 decommissioning area.

10 MR. ATHERTON: What about its qualification to last in the
11 spent fuel pool over a certain period of time?

12 MR. RICHARDS: Well, again, you know, we have had people get
13 up and talk about the fact that our general experience is that this
14 equipment does not degrade, there are surveillance requirements with the
15 spent fuel pool racks. Unless you have a specific technical issue to
16 ask us, generally, what about aging of the equipment, that is difficult
17 for us to deal with. Do you have a question related to the discussion
18 on decommissioning that we are talking about today?

19 MR. ATHERTON: Well, I would like to make a constructive
20 suggestion. Lynnette, I guess it was, had suggested some sort of
21 interim standard from NRC concerning how industry should approach their
22 decommissioning. The techniques used back in the 1970s with the
23 establishment, beginning at the branch level, of branch technical
24 positions, before they were ever made into Reg. Guides, and it was, you
25 know, well digested within the branch before the position was taken, and
then the branch took that position and industry knew about it. And
this, again, was before a Reg. Guide was issued or before it went even
further beyond that. And I am wondering, have things changed in some
20-25 years such that these types of things don't exist anymore? Is a
branch capable of coming forth with a branch technical position on an

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1 interim basis?

2 MR. BARRETT: What was changed in the last 25 years I think
3 -- branches are still capable of coming forward with branch technical
4 positions. But the agency has evolved into more of a position wherein
5 any time we change a position or establish a position, we try to make it
6 a more open process now, so that it becomes more difficult and more
7 time-consuming to develop a technical position. You can still do it,
8 and I am sure there is a threshold for that sort of thing, but for
9 anything of substance, anything that has substantive impact potentially
10 on public health and safety, it tends to be a more open process.

11 MR. ATHERTON: Okay.

12 MS. ORDAZ: And that would include the ACRS and possibly the
13 CRGR, so that is more of a lengthy process than a near-term.

14 MR. BARRETT: That is not to say it can't be done, but it is
15 not as -- it is more open now and more difficult.

16 MR. ATHERTON: For instance, I would have a question
17 concerning the assumptions made for -- was it the PRAs, a three page
18 list of assumptions that you said would be available in August? If the
19 assumptions are being used today, why not make at least that available
20 without, you know, the end result before August.

21 MR. BARRETT: Those assumptions were used in this
22 preliminary analysis, which is not being used today. We specifically do
23 not plan to use this analysis in any regulatory decisions until we have
24 had the benefit of independent technical review and stakeholder
25 interactions.

MR. RICHARDS: Mr. Atherton, could I ask how long a list you
have? You have had about -- I think between this morning and this
afternoon, about an hour of our time.

MR. ATHERTON: I have one other question then.

MR. RICHARDS: Okay.

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1 MR. ATHERTON: I will move on. Several utilities have sued
2 the federal government, I think it is primarily the Department of
3 Energy, concerning the Department of Energy's not complying timely with
4 removing spent fuel from their spent fuel pools. To the extent that
5 this impacts NRC's obligations in regulating decommissioning, to what
6 degree does NRC find itself legally in a conflict of interest situation?
7 Being the federal government regulating spent fuel pools, utilities have
8 no place to put their spent fuel except in their spent fuel pools, not
9 at some permanent or even temporary waste storage site. How is NRC
10 impacted legally by these extracurricular happenings?

11 MR. RICHARDS: I can't answer that question, we don't have
12 anybody from our Office of General Counsel here today. If you want to
13 talk offline, we can see about getting you an answer. Anything else
14 today, Mr. Atherton?

15 MR. ATHERTON: Well, if I could go one more step, Lynnette,
16 or I guess NEI --

17 MR. RICHARDS: Is this your last question then today?

18 MR. ATHERTON: This is my last.

19 MR. RICHARDS: Other than this, I would like to talk to you
20 separately, and we will get your concerns.

21 MR. ATHERTON: Okay. NEI had pushed for a reasonable
22 approach to the accident scenario, I guess for PRA purposes, versus
23 contemplating the worst case situation. In design of nuclear power
24 plants, we always used the worst case, found out what that was like and
25 then moderated it if we felt that it was appropriate to do so. How does
NRC feel about this approach to resolving the decommissioning problem?

MR. BARRETT: What we do, Mr. Atherton, is we still use that
approach for defining the design basis of equipment, for the so-called
design basis accidents, design basis events. That is not the way we
approach probabilistic risk assessment, though. What we do in

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1 probabilistic risk assessment is we look at a whole spectrum of
2 accidents from ones that are the most limiting, and presumably less
3 likely, to those that are less limiting, and presumably more likely, and
4 we try to examine the frequencies with that whole spectrum of accidents
5 happen, and the consequences. And then it is that combination of
6 frequency and consequences that tells us ultimately what types of
7 accidents are the ones that are the biggest contributors to risk.

8 Now, we have got 25 years of experience in analyzing the
9 kinds of accidents that are most -- that are the biggest contributors to
10 the risk of operating a nuclear power reactor, either a BWR or a PWR.
11 But we are in a little bit of unfamiliar territory here in analyzing
12 what types of accidents and initiators are the most important
13 contributors to this particular phenomenon for a decommissioned nuclear
14 power plant. But we look at the spectrum, and for the spectrum of
15 possibilities, we look at their frequencies and their consequences, and
16 it is the product of those two figures that give us the figure of merit
17 we are interested in, which we call risk. That is how we define risk.

18 MR. ZWOLINSKI: Going back 25 years ago, if you want to use
19 the vernacular, the agency has always used the reasonable assurance
20 standard, not the absolute assurance standard. And we continue to use,
21 in this case, a risk-informed reasonableness test, not an absolute test.

22 MR. BARRETT: If I could use an example, I don't know when
23 you left the agency, but I am sure you know that large break
24 double-ended guillotine LOCA is the limiting LOCA for a lot of purposes.
25 When we do PRAs, we find out, yes, indeed, it is a limiting accident,
but it is not the dominant risk accident because of the low frequency of
it, and because of all the mitigating systems that have been put into
the plant to deal with it. Other accidents which are much less limiting
turn out to be the ones that dominate risk.

MR. ATHERTON: However, the industry was required to design

1 their safety systems on the basis of this.

2 MR. BARRETT: That's right. And we still have this duality.

3 MR. ATHERTON: But we have, you know, --

4 MR. BARRETT: We have this duality, we design equipment in
5 accordance with these more limiting accidents. We analyze risk in terms
6 more of realistic accidents.

7 I am sorry, maybe I am not addressing your question.

8 MR. RICHARDS: Mr. Atherton, in the interest of time, can we
9 talk separately offline then?

10 MR. ATHERTON: Okay.

11 MR. RICHARDS: For the rest of your comments. We would
12 appreciate that.

13 MR. ATHERTON: I thank you very much for letting me speak.

14 MR. RICHARDS: Thank you.

15 NEI have any closing comments?

16 MR. MEISNER: I would like to go back to a question we asked
17 earlier, and that is, what do you see this SECY or document, June 18th,
18 to consist of?

19 MR. RICHARDS: We see it as being basically an update to the
20 Commission as to what we have accomplished to date, laying out the
21 schedules for what we intend to do in the future.

22 MR. MEISNER: Would you characterize it more as a plan as
23 opposed to technical information?

24 MR. RICHARDS: Yes.

25 MR. ZWOLINSKI: Hadn't we considered approaching the
Commission with the phased approach and suggesting or possibly
recommending a section that should have the decommissioning all put into
one? I think some of the process issues that you heard Bill Huffman go
through, much of that we were going to try to put in as process, and to
the technical working group, that was going to be far more succinct, to

1 be more of a status overview of here is what is going on.

2 MR. MEISNER: Yeah, I guess I was most concerned with the
3 Commission won't see any of these assumptions, for instance.

4 MR. RICHARDS: We don't think it is appropriate to bring the
5 product to the Commission because it is not a done product. Like John
6 said, on the process side, we feel more comfortable sending a proposal
7 up to the Commission asking -- or seeking their approval to go forward.
8 So, no, we don't anticipate giving the Commission a lot of detail on
9 what has been done today on the technical working group.

10 Other comments or questions? John?

11 MR. ZWOLINSKI: Thanks, but I think the long hand on the
12 wall is starting to press us for time.

13 Thank you very much for your attendance today. I think it
14 is important that we continue to meet and we will back in touch as to
15 what would be appropriate as to the next meeting and just go from there.

16 MR. DUDLEY: Okay. With that, we will adjourn the meeting.

17 [Whereupon, at 2:58 p.m., the meeting was concluded.]
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